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WATER RESOURCES DEPT.
SALEM, OREGON

Application
for a
Site Certificate
for
Hermiston Generating Project

Addendum 1

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Instructions for Revising Hermiston Generating Project ASC

The following table identifies the text, tables, or figures that should be replaced or added to the Hermiston Generating Project ASC to update your original copy.

	Remove	Replace with	Add
Exhibit A			
	Pg. A-1	A-1a	
Exhibit B			
	Entire Text	Pg. B-1a thru B-25a	Table B-2 & B-3 after text
	Fig. B-1	Fig. B-1a & B-1b	Exh. B-1 after figures
	Fig. B-2	Fig. B2a	Exh. B-2 after Exh. B-1
			Exh. B-3 after Exh. B-2
Exhibit C			
	Fig. C-1	Fig. C-1a	
	Fig. C-3	Fig. C-3a	
	Fig. C-4	Fig. C-4a	
Exhibit D			
	Pg. D-2 & D-3	Pg. D-2a & D-3a	
	Pg D-8	Pg. D-8a and D-8b	
	Exh. D-1 thru D-3	Exh. D-1a thru D-3a	
Exhibit E			
	No Revisions		
Exhibit F			
	Entire Text	Pg. F-1a thru F-7a	Fig. F-1b after Fig. F-1a
	Fig. F-1	Fig. F-1a	Exh. F-1 after Fig. F-1b
Exhibit G			
	Pg. G-7	Pg. G-7a & G-7b	Fig. G-5
	Pg. G-10	Pg. G-10a thru G-10c	Appendix G-1
	Table G-3	Table G-3a	
Exhibit H			
	Pg. H-1 & H-2	Pg. H-1a & H-2a	
	Fig. H-1	Fig. H-1a	

	Remove	Replace with	Add
Exhibit I			
	Entire Text Fig I-1 thru I-4	Pg. I-1a thru I-35a Fig. I-1a thru I-4a	Exh. I-2 after Exh. I-1 Exh. I-3 after Exh. I-2
Exhibit J			
	Pg. J-1 Fig. J-1	Pg. J-1a Fig. J-1a	
Exhibit K			
	Entire Text	Pg. K-1a thru K-11a	Exh. K-3a thru K-12a after Exh. K-2
Exhibit L			
	No Revisions		
Exhibit M			
			WPCF Permit at end of Exhibit
Exhibit N			
	Pg. N-3	Pg. N-3a & N-3b	
Exhibit O			
	Entire Text	Pg. O-1a thru O-3a	
Exhibit P			
	Entire Text	Pg. P-1a thru P-20a	Fig. P-1a App. P-2
Exhibit Q			
	Pg. Q-2 Fig. Q-1	Pg. Q-2a & Q-2b Fig. Q-1a	
Exhibit R			
			Table R-1 & R-2
Exhibit S			
	Pg. S-3 Fig. S-1	Pg. S-3a & S-3b Fig. S-1a	
Exhibit T			
	Pg. T-3 thru T-6	Pg. T-3a thru T-6a	

	Remove	Replace with	Add
Exhibit U			
	Entire Text	Pg. U-1a thru U-22a	
Exhibit V			
	Pg. V-1 & V-2	Pg. V-1a & V-2a	
Exhibit W			
	Pg. W-2 thru W-6	Pg. W-2a thru W-9a	
Exhibit X			
	Entire Text	Pg. X-1a thru X-3a	
Exhibit Y			
	No Revisions		
Exhibit Z			
	Pg. Z-2 & Z-3	Z-2a & Z-3a	
Exhibit AA			
	Pg. AA-1	Pg. AA-1a	
	Pg. AA-4	Pg. AA-4a	
	Pg. AA-6 & AA-7	Pg. AA-6a & AA-7a	
	Pg. AA-9	Pg. AA-9a & AA-9b	
Exhibit BB			
	No Revisions		
Exhibit CC			
	No Revisions		

A

ONEticket Tab Page

EXHIBIT A

APPLICANT INFORMATION

INTRODUCTION

This SCA is for a nominal 477 MW natural gas-fueled energy facility and certain related and supporting facilities to be built near Hermiston, Umatilla County, Oregon.

NAME AND ADDRESS OF APPLICANT-PARTNERSHIP - OAR 345-21-015(1)(a)(A)

Hermiston Generating Company, L.P., a Delaware limited partnership, is filing the SCA.

Applicant's address and telephone number are:

444 Market Street, 19th Floor
San Francisco, California 94111
(415) 291-6481
(415) 291-6450 fax

Partnership Information - OAR 345-21-015(1)(a)(B))

The partnership agreement is attached as Exhibit A-1.

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B

EXHIBIT B

PROJECT DESCRIPTION

INTRODUCTION

The Hermiston Project is a high-efficiency combustion turbine/combined cycle electric power plant that will be fueled by natural gas. It will generate electricity for sale at the wholesale level to regional electric utilities, that will, in turn, sell this electricity at the retail level to the end users. The Project is expected to have a nominal electric generating capacity of 474.2 MW at annual average site conditions.

In addition to generating electric power, the Hermiston Project will supply process steam to the Lamb-Weston, Inc. potato processing facility located on Westland Road in Hermiston, Oregon, adjacent to the energy facility. Lamb-Weston, a subsidiary of ConAgra, Inc., is a nationwide leader in the production and sale of frozen potato products and a technological leader in the formulation of value-added potato products. The company supplies virtually every major fast-food company in the U.S., and is a leading supplier to the traditional restaurant and food service trade. The Lamb-Weston facility produces primarily frozen french fries and other value-added potato products. It is one of the largest employers in the area, with a workforce of over five hundred people, and is a major driver of the local economy. Due to the efficiencies of cogeneration, the Project will be able to supply steam at a lower cost to Lamb-Weston than if Lamb-Weston itself produced the steam. This will help to keep the Lamb-Weston facility viable in the very competitive food processing business.

Lamb-Weston uses steam for processing equipment, heating, and cooking. A pipeline with a diameter of about 8 to 10 inches will be constructed from the energy facility to the Lamb-Weston facility to supply steam from the energy facility. The Lamb-Weston steam load that is to be supplied by the Project is expected to remain at a constant annual average level through the life of the Project. Variations in the Project's electrical output due to variations in the actual steam loads will be minimal, approximately ± 2 percent.

This Exhibit describes the energy facility, its related and supporting facilities and its nominal electric generating capacity. Exhibit B also includes general design drawings of the Project. The discussion in this Exhibit is relevant to the structural standards set forth in OAR 345-22-020.

REVISED PLANT CAPACITY - Project Order Addendum 2 Paragraph I.A.

The Notice of Intent (NOI) for the Hermiston Project was filed on February 24, 1992. In the NOI, the capacity of the project was stated as 230 MW. In the ASC, the size of the project has been increased to 477 MW. The increase in the size of the facility was in response to an increased need for resources in the region in general. Two specific actions taken by regional utilities between the time of submittal of the NOI and the submittal of the ASC described below illustrate this increasing regional resource need.

The size of the project was increased because of developments in the marketplace after the NOI was submitted. Two specific events were the publication of the Portland General Electric Company's "Integrated Resource Plan" in November 1992 and the issuance of the Bonneville Power Administration's "1992 Resource Program -- 10 Year Plan" in October 1992. Both of these documents identified increased needs for new baseload generation in the 1996-2000 period which could not reasonably have been anticipated when the NOI was filed.

In its 1992 Integrated Resource Plan, PGE decided to phase out its Trojan Plant over a four period. (Its subsequent decision in early 1993 to close the plant immediately did not significantly affect PGE's needs for "Trojan Replacement" resources.) This triggered a new need for approximately 600 MW of capacity by 1996. The plan assumes that this will be in the form of combined cycle combustion turbines ("or equivalent amounts of independent or cogeneration

power"). As the PGE IRP was released after the filing of the NOI for the Hermiston project, this need could not reasonably have been anticipated when the NOI was filed.

In total, PGE sees a need for 1,650 MWa of baseload energy added to its system by 2012. This is made up of resources to meet the moderate load growth forecast, to replace PGE's share of Trojan and to cover the loss of about 100 MWa of other resources.

In its December, 1991 draft of the 1992 Resource Plan, BPA announced that its strategy was to acquire 250 aMW of new supply-side resources and to option 250 aMW of resources, in addition to the 350 MW of new resources and 800 MW of resource options it was pursuing through several ongoing acquisition programs. In the final 1992 Resource Program, dated October, 1992, BPA increased the target for immediate acquisition of new supply-side resources to 400 MW. As the final resource plan was released after the NOI was filed, these needs could not reasonably have been anticipate at the time the NOI was submitted.

FACILITY DESCRIPTION, INCLUDING RELATED AND SUPPORTING FACILITIES - OAR 345-21-05(1)(b)

Overview

The energy facility -will consist of two essentially identical side-by-side combustion turbine generators, two heat recovery steam generators (HRSG), and two steam turbines. A process flow diagram for one of the twin units is provided as Figure B-1a. A site plan and general arrangement for the Project are provided as Figure B-2a and Figure B-2A. Natural gas fuel will be compressed and burned in the gas turbines in a manner similar to that of a jet aircraft engine. In each gas turbine, expanding combustion gases will turn a rotor which, attached to a generator, will produce electricity. The hot combustion gases exhausted from the combustion turbine will then be used to generate steam in the HRSGs. Steam from the HRSGs will be expanded through steam turbines and condensed in condensers for return to the HRSGs, where the water will again be turned to steam. The steam turbines are also attached to generators to make electricity. Cooling water for the condensers will be provided from a cooling tower system utilizing evaporative cooling.

Significant Facility Structures and Buildings

The Project will include the following structures and buildings:

- Two combustion turbine enclosures complete with an air inlet structure for each turbine. -The packages and accessory equipment will be enclosed to the extent necessary for weather protection

- Two steam turbine areas, including foundations and support structures, for each of the two steam turbines and their associated surface condensers.

- A common warehouse buildings for the facility. The warehouse will house a workshops, a maintenance area, and offices. This building will be approximately 4,500 square feet and may share common walls with the other buildings.

- An open structure of approximately 7,000 square feet housing each HRSG. Each HRSG will be located adjacent to its combustion turbine and will connect to an approximately 190 foot high emission stack. There will be one stack for each unit or a total of two stacks for the facility.

- Two four-cell mechanical induced draft evaporative cooling towers, one for each unit.

- A single auxiliary boiler.

- An air compressor system for each unit.

- Demineralized water storage in two cylindrical tanks, each with a capacity of 250,000 gallons each.

- A 55,000 square foot outdoor electrical switchyard.

- Paved roads and parking areas.

- Various utility interconnections (natural gas pipeline, electrical transmission line, steam pipeline, water pipeline, and effluent disposal pipeline).

The Project structures will be architecturally designed to visually integrate with the surrounding area. Neutral colors will be used for the stack and for site buildings. Aesthetically pleasing landscape designs and architectural treatment will be incorporated into the site plan. The design objective of the proposed landscape plan will be to allow easy access to equipment, while partially screening and providing visual buffering to the facility.

Permanent on-site parking will be provided to accommodate all employees in addition to maintenance crews, visitor, and deliveries. Handicapped parking will be provided.

An elevation diagram showing the proposed structures is provided as Figure B-3.

Related and Supporting Facilities

Related and supporting facilities for the Project will include a natural gas pipeline that will be constructed primarily to bring gas from an interstate pipeline to the energy facility site and an electric transmission line that will be constructed primarily to deliver the Project's electrical output to a major regional electric substation. The natural gas pipeline will be less than sixteen inches in diameter and less than five miles in length. The transmission line will lie entirely within Umatilla County and partially within the City of Umatilla, and will consist primarily of an upgrade of an existing line to 230 kV within an existing right-of-way. Thus, neither of these facilities is an "energy facility" within the meaning of ORS 469.300(10).

Power Generation Components

There are five major systems associated with power generation at the energy facility: the power generation system, the cooling cycle system, the auxiliary boiler, the control system and the electric power system. Each of these systems is discussed below.

Power System

Four components comprise the power system: the combustion turbine, the heat recovery steam generator, the steam turbine and the stack.

Combustion Turbine Generator ("CT")

The Hermiston Project will employ two advanced gas fired, General Electric Company, Frame 7FA, combustion turbines. The basic elements of these units include a compressor, a dry low-NO_X combustor, a turbine, and an electric generator. Within the combustor, injected fuel will be mixed with compressed air from the compressor and fired. The resulting hot exhaust gases will drive the turbine blades to rotate a shaft driving both the inlet air compressor and the electric generator. Some of the rotational energy of the shaft will be used to compress the incoming combustion air. However, the greater portion of the shaft's rotational energy will drive the generator to produce the facility's electrical output. At full load, each combustion turbine will burn approximately 1,700 MMBtu/hr of fuel. This will be converted in the electric generator to a total (nominal) electrical output of 158 MW for each unit. To improve the efficiency of the CT during the summer, an air inlet cooling system will reduce the temperature of the outside air drawn into the air compressor during the combustion process.

Fuel for the turbines will be natural gas. The CT will be housed in an enclosure which provides thermal insulation, acoustical attenuation, and fire extinguishing media containment. The enclosure will allow access for routine inspections and maintenance.

Heat Recovery Steam Generators ("HRSGs")

One of the significant features of a combined cycle plant is the utilization of the hot exhaust gas from the combustion turbine to produce steam which is, in turn, expanded in a steam turbine to drive an electric generator and produce electricity. The Heat Recovery Steam Generator is the key piece of equipment necessary to the production of this steam.

The power generation system planned for the Hermiston Project will exhaust combustion turbine

gas through the HRSG where it will give up thermal energy in a convective heat transfer process to reduce the turbine exhaust temperature from 1100°F to about 205°F at the stack. This heat is transferred through the HRSG tube-walls to heat the feedwater from about 100°F to as high as approximately 1,000°F.

To achieve a high level of efficiency of electrical generation in the steam turbine, the HRSG accomplishes its heat transfer process in three stages or pressure levels and is commonly referred to as a triple pressure system.

This three stage process begins with the pumping of about 1055 gallons per minute ("gpm") of water at approximately 100°F from the condenser to the low pressure ("LP") section of the HRSG. In this section the temperature is increased to about 585°F. A small percentage of the flow, about 123 gpm, is flashed to low pressure steam at 60 pounds per square inch absolute ("psia") and goes directly to the LP section of the steam turbine. The remainder continues through the HRSG, increasing in temperature and pressure to about 1000°F and 1400 psia, and then flows as high quality steam to the high pressure ("HP") section of the steam turbine.

To increase the output of the steam turbine and improve its efficiency, the HP steam that leaves the high pressure section of the steam turbine is sent back to the HRSG where it picks up additional thermal energy in an intermediate stage of the HRSG called the intermediate pressure ("IP") section. Here, the steam is reheated from about 654°F back up to 1000°F and then is sent back to the steam turbine's IP section. The IP steam mixes with the LP steam about two thirds of the way through the steam turbine and then exhausts to the condenser where the steam is condensed to water (at 100°F). This condensed water is then pumped back through the cycle again.

Steam Turbine ("ST")

Each ST is designed to produce approximately 80 MW of electricity without the consumption of additional fuel. The ST is a triple admission, reheat, condensing turbine and is designed for sliding pressure operation. This means that the steam turbine inlet pressure follows the pressure set by the output of the HRSG which is, in turn, a function of combustion turbine output. The HP portion of the ST receives high pressure superheated steam from the HRSG and then exhausts

steam into the reheat section of the HRSG. Reheated steam from the HRSG is supplied to the IP turbine, and the IP turbine exhausts into the low pressure LP turbine. The LP turbine receives low pressure superheated steam from the HRSG and exhausts steam into the condenser. One of the steam turbines will be equipped with extraction nozzles for providing process steam to Lamb-Weston.

Stack

After going through the HRSG, the exhaust flow will vent to an approximately 190 foot stack. In accordance with EPA and Oregon Department of Environmental Quality ("DEQ") guidelines, the stack height will be 2 1/2 times the height of the tallest surrounding structure, thereby meeting the standard of Good Engineering Practice ("GEP"). The GEP height eliminates the potential for aerodynamic down wash of stack emissions, while minimizing visual impacts of the stack.

Cooling Cycle

Steam Turbine/Condenser

After the steam passes through the steam turbine it is condensed in a shell and tube heat exchanger (surface condenser) with cooling water from the cooling tower. Each condenser will include its shell, tubes, a water box, and hot well. Condensed water in the hot well is pumped back to the low pressure section of the HRSG to begin the thermal cycle again.

Cooling Tower

Cooling for the condenser will be evaporative (wet) cooling using mechanical induced draft cooling towers. Fans at the top of the cooling tower maintain a draft within the cooling tower. Circulating water pumps will move the water from the cooling tower basin through the circulating water piping system to the tube side of the condenser and back to the top of the cooling tower. During this process, cooling water does not come into contract with water circulating in the HRSG that will be heated to make steam. The water will be cooled by evaporation as it falls through baffles from the top of the cooling tower to a basin at the bottom of the tower where it is again pumped back through the condenser. Cooling tower components include the basin, fans, fan

deck, drift eliminators, fill material (baffles), and other necessary components. The cooling towers will also include a fire protection system, consisting of sprinklers, and fire suppression equipment.

Each cooling tower is approximately 230 feet in length by 55 feet in width by 50 feet in height and includes a basin holding 500,000 to 600,000 gallons of water used for circulating through the condenser for cooling.

Auxiliary Boiler

An auxiliary boiler will be provided capable of supplying 100,000 pounds of steam per hour for startup purposes, and for Lamb-Weston's use during power plant outages. The auxiliary boiler may also be used for freeze protection during power plant outages.

Control System

Each unit will have a state-of-the-art, integrated microprocessor based control system for plant control, data acquisition, and data analysis. The plant control system will provide for startup, shutdown, and control of plant operation within limits, and for protection of equipment.

Electric Power System and Interconnection

Electric Power System

Electric power will be generated by the combustion turbine generator and the steam turbine generator. The output of each combustion turbine generator will be connected to its 18.0 kV-230 kV main step-up transformer. The output of each steam turbine generator will be connected to its 13.8 kV-230 kV main step-up transformer. The outputs of the combustion turbine and steam turbine generator main step-up transformers will then be bused (i.e., joined) together on the 230 kV side of the transformers. A tower for the utility interconnection to the 230 kV bus will also be provided. A 4.16 kV bus and other related equipment will be provided inside of the energy facility to handle internal loads. An electrical single-line diagram is shown in figure B-4.

Interconnecting Transmission Line -- Project Order Addendum 2 Paragraph I.B

The Project will deliver electric power to the regional power grid at BPA's McNary Substation at Umatilla, Oregon, approximately 12 miles from the energy facility site. The transmission interconnection schematic arrangement is shown in Figure B-5.

The Project will require upgrading of an existing 115 kV transmission line, operated by Umatilla Electric Cooperative, to 230 kV. Approximately 12 miles of this transmission line, entirely within Umatilla County and partially within the City of Umatilla will be upgraded between the energy facility site and the interconnection with the McNary Substation. This upgrade will consist of replacing existing wooden poles with single-shaft steel poles and adding the new 230 kV circuits to the steel poles that will then carry both the existing 115 kV and the new 230 kV circuits. The 12.47 kV underbuild along the entire length of the present line will also be retained, possibly with continued use of some of the wooden poles. Depictions of typical steel pole designs under consideration are provided as Figure B-6. The new poles will incorporate raptor-proof design features described in Exhibits P and R. The upgrade will occur within the existing transmission right-of-way. Figure C-3a shows a detail of the transmission line route, including the sections where the existing 115 kV and 12.47 kV lines will be maintained, replaced, or upgraded. Figure I-3a shows the proximity of the transmission line route to the City of Umatilla.

Because of the expected routing of the new 230 kV transmission line into the McNary Substation, it is likely that approximately 1/4 mile of new 230 kV transmission line will be constructed north of Highway 730, as the line enters the McNary Substation. This new section of transmission line will be of similar design to that of the upgraded portion of the line, except only the 230 kV circuit will be carried on the new poles.

Environmental Protection Components

Air Pollutant Emissions Control -- Project Order Addendum 2 Paragraph II.A.3

The Project will emit NO_X (nitrogen oxides), CO (carbon monoxide), non-methane hydrocarbons, and small quantities of particulate. Emission controls incorporated in the Project design are described below.

NO_X Control Systems

The Project will be designed to control NO_X using an advanced Dry Low-NO_X combustor and a Selective Catalytic Reduction (SCR) system. This will be a state-of-the-art design, capable of achieving 4.5 ppmvd NOx levels.

Continuous Emissions Monitoring System

A separate monitoring system for airborne pollutants will be installed to provide monitoring and alarming of NOx and CO concentrations in both HRSG exhaust systems. The continuous emissions monitoring systems ("CEMs") will provide input signals to the microprocessor based data acquisition system, previously described, and will meet all the requirements of the Oregon Department of Environmental Quality for monitoring and reporting.

Other Emissions

Because the facility will be fueled by natural gas, only trace amounts of SO_2 will be emitted. Control of CO and non-methane hydrocarbons will be achieved through maintenance of proper combustion controls.

Process Water

As part of the cooling cycle, make-up water will be added at the cooling tower basin to replace water lost through evaporation or discharged from the cooling tower. As the cooling water is concentrated through evaporation in the cooling towers, cooling water must either be discharged from the system as blowdown; or scaling constituents (silica and carbonates) must be removed from the cooling water, maintaining water quality levels to protect the cooling tower. The Hermiston Generating Project will take one of two approaches to managing the cooling water; the project will either discharge cooling water to Madison Ranches for crop irrigation, or the facility will incorporate a sidestream softener which will remove silica and carbonate from the cooling water. These two approaches are discussed below.

Land Application of Cooling Water

Discharged cooling water would have the character of the feedwater supply with native constituents in somewhat higher concentrations due to evaporation. The Project would provide cooling tower blowdown for beneficial reuse by Madison Farms, which will use the discharge for crop irrigation. Madison Farms is constructing a distribution system to convey water from the Columbia River, along with the cooling water from the Project, to its fields for irrigation. The distribution system will include a water pipeline and pump stations to convey water to the boundary of Madison Farms, as well as additional pumping, distribution, and storage facilities within Madison Farms. The purpose of this distribution system is to expand the area under irrigation to the full extent of Madison Farm's existing water rights. The plan for reuse of this water is described in *Cooling Water Reuse Land Application System Management Plan,* CH2M Hill, Portland, Oregon, 1992, a copy of which is provided in Exhibit M. See also Exhibit F.

Sidestream Softener Approach

Under this option, the Hermiston Generating Project will not have a process water discharge (blowdown) typical of conventional power plants. The facility design will incorporate a sidestream softener to control water chemistry and allow for reuse of the process water. Control of the water chemistry in the cooling tower is managed primarily through the removal of scale causing constituents (primarily silica and carbonate) which have been concentrated by evaporation of fresh water in the cooling tower. Sidestream softening removes silica and carbonates through chemical reactions with lime and other precipitation-inducing chemicals in a clarifier fed by a sidestream of the cooling tower water flow.

This alternative has the advantage of reducing make up water requirements (i.e. reduced water use) and eliminating the need for wastewater disposal. Approximately 200 gallons per minute (gpm) of water (per combined cycle unit) from the cooling tower will be directed to a clarifier instead of requiring disposal.

Hydrated lime ($Ca(OH)_2$) and magnesium sulfate (or, depending on specific water chemistry requirements, other similar chemical compounds) would be added in the clarifier to control

calcium hardness and silica. Because these constituents are removed from the sidestream in the clarifier, the effluent from the clarifier is suitable for makeup to the cooling tower and would be mixed with fresh water in the cooling tower basin.

Precipitated silica and calcium would be thickened and dewatered in a filter press. Liquids would be recycled back to the clarifier and ultimately reused in the cooling tower. Depending on the actual total water loss from the cooling tower through the combined mechanisms of evaporation, drift and water entrained in the filter cake solids as well as final design configurations there may be a need to further control the build-up of dissolved solids (TDS) in the cooling water. If necessary, this TDS build up would be managed by a combination of increased cycles of concentration in the cooling tower and additional water treatment in the sidestream process. This water treatment could include the use of Reverse Osmosis (to create a low TDS stream and a more concentrated, lower volume stream), and either a brine crystallizer/concentrator system or other method of evaporation of water to separate out the scale-causing salt solids.

The solids by-product, consisting primarily of magnesium silicate and calcium carbonate, is a non-hazardous material suitable for off-site landfill. Depending on extent of dewatering, approximately 650 lb/day (per combined cycle unit) of filtercake would be produced from the sidestream softening operation. About 10 tons/month of filtercake (per combined cycle unit), at full operation, would be disposed off-site in a permitted landfill (see Exhibit F for details on disposal).

Each combined cycle units would be served by a separate sidestream softener, with the following main components:

- A 16 to 20 foot diameter clarifier with a flow of approximately 200 gpm; calcium hydroxide and calcium sulfate will be added to remove hardness and silica.

- Transfer pumps with a capacity of approximately 200 gpm to pump clarifier effluent to final filters. Filtered water will be returned to the cooling tower basin as part of the overall make up water supply.

- Sludge transfer pumps that take precipitated silica and carbonates from the clarifier to the

sludge thickener.

- Sludge thickener which further concentrates flocculant for transfer to the solids filter press.

- Plate press or belt type filter press to dewater sludge. Resulting filter cake containing approximately 20 percent liquid will be disposed of off-site and removed liquids will be returned to the cooling tower.

- Brine crystallizer (if necessary) to evaporate a portion of the sidestream cooling water flow to boil out the salts. Relatively pure water vapor would be recovered and reused back into the cooling tower. The non-hazardous salts would be added to the solids being transported to off-site disposal.

A process diagram for the sidestream softener is provided as Figure B-1b and a letter from the manufacturer describing the process is included as Exhibit B-3.

Roof and Stormwater Discharge -- Project Order Addendum 2 Paragraph II.M.2

A storm drainage system will be provided for the entire plant area. Individual drain systems will be provided for the turbines, HRSG, water treatment and service areas. Each roof system will include curbing, allowing the areas to drain into catch basins located at ground elevation. Runoff from the roof will be collected in a common gutter; it will then be conveyed to an on-site detention basin for quiescent settling.

Stormwater from the Project will be collected by a system of drains and catch basins. Catch basins and manholes will be connected by underground piping into a gravity system. The gravity system will discharge to detention basin designed to detain runoff from the 100 year, 24 hour storm event with approximately a 50 percent surplus capacity. Water from the detention basin will be discharged to the cooling tower basin to be used as process cooling water.

Solid Waste

Construction of the Project is expected to generate waste steel, other waste metals, and normal

miscellaneous construction debris (consisting of wood, concrete, paper, and other refuse). In addition, approximately forty tons per year of normal domestic waste and 6 tons per month of filter cake (if a sidestream softener system is used) will be generated during Project operation. Disposal plans for this waste are discussed in Exhibit F.

NOMINAL ELECTRIC GENERATING CAPACITY - OAR 345-21-015(1)(b)

Operating Parameters

The two unit energy facility will have a nominal generating capacity of approximately 477 MW with zero steam supply to process and net of station power. Its expected ratings, based on preliminary information, are:

Gross power output:	490.3 MW at 50°F, adjusted to site elevation (600')
Capacity factor:	93 percent
Steam to process:	70,000 lb/hr (normal operating point)
Forced outage rate:	2 percent
Station power:	13.1 MW
Capacity net of station power:	477.2 MW
Generating voltage:	18.0 and 13.8 kV
Step-up voltage:	230 kV

Comparable Facility Performance Data -- Project Order Addendum 2 Paragraph III.D.

The planned ratings above are based on presently guaranteeable performance of the GE STAG 107FA, as indicated below. Exhibit B-1 is an operating summary for the Chesterfield Station, the first example of the GE STAG 107F technology. The Chesterfield plant is somewhat smaller than the Hermiston Project, with a gas turbine rated at 150 MW, and steam turbine at 64 MW, Further, the Chesterfield plant must compress its fuel supply on-site, which causes a substantial degradation to the output and heat rate of the facility.

As described in Exhibit B-1, performance results for the first unit at Chesterfield during the period

from June through December, 1990, yielded an average capacity over the operating period of 172 MW, and a heat rate of 8,149 Btu/kwh. The capacity value is lower, and the heat rate value is higher than would normally be expected because of the need for on-site gas compression. Without gas compression, the equivalent heat rate would be 7,550 Btu/kwh. The plant operated at an equivalent availability factor of about 79% even though the project experienced several problems of the type that are to be expected from a new facility using a new design.

Exhibit B-2 provides additional information about the operating experience with this technology.

Nameplate Capacity Rating, Basis and Assumptions --
Project Order Addendum 2 Paragraph II.E

The nameplate capacity rating for the Hermiston Generating Project is 490,260 gross kW for the two unit facility. This rating is based upon Guarantee Conditions provided by the General Electric Company for their STAG 107FA engine based combined cycle system with adjustment for site elevation. The rating assumes a site elevation of 600 feet above sea level. The nameplate capacity rating is quoted excluding an allowance for plant auxiliary loads.

Net Plant Output

The amount of power needed by plant systems to operate pumps, fans, compressors, and other equipment necessary to run the combined cycle system has been determined by General Electric and Bechtel to be 6,555 kW per unit, or 13,110 for the facility at the gross power point of 490,260 kW. A breakdown of the major plant loads is provided in Table B-3. It is anticipated that these loads may be supplied by others for the Project. However, if the Project's generating output is used to serve these loads, this yields a net power production capability available for use of 477,150 kW for both units when producing electricity only at 50°F

Output at Annual Average Site Conditions

As described below, the output of the facility is affected by ambient temperature and humidity, in addition to site elevation and auxiliary loads. 52.8°F and 55 percent relative humidity are representative of annual average conditions at the plant site. Historical temperature values are

given in the PSD Analysis in Exhibit M.

The vendor-guaranteed output of the facility, new and clean, adjusted for standard atmospheric pressure at the site elevation, 52.8°F ambient temperature, 55 percent relative humidity, and with no steam supplied to process is estimated as 487 MW. Subtracting auxiliary loads of approximately 13 MW from the gross output, the net output for the facility will be 474 MW. Although this value is representative of the expected capacity of the facility, the output of the plant may exceed this value due to cooler-than-average temperature conditions or manufaturer's tolerances. Further, final refinement to the design may affect slightly the output of the plant.

The net output of 474 MW was determined on the basis of preliminary information provided by General Electric (GE) for the Hermiston project at 50°F, 60 percent humidity, and 1.95" Hga back pressure on the steam turbine. The output was corrected to 52.8°F, 55 percent relative humidity, and 1.6" Hga back pressure (average annual conditions) using GE-provided correction curves for these values. The GE correction curves are provided as Exhibit B-4. Based on the correction curves, the following corrections were made to the net plant output.

	Manufacturer's Guaranteed Values (New & Clean)	Maximum with Manufacturing Tolerances	Average Lifetime Maximum Expected (w/2% Degradation)
Gross output at 50°F, 60 % RH, and 1.95" Hga:	488,860 kW	498,637 kW	
Correction to 1.6" Hga back pressure:	+1,400 kW	+ 1,400 kW	
Gross Output	490,260 kW	500,065	490,260
Correction to 52.8°F:	X 0.994	X 0.994	At Annual Average
Correction to 55 % RH:	X 1.00	X 1.00	Conditions
Corrected Gross Output	487,318 kW	497,037 kW	487,318 kW
Auxiliary load:	-13,110 kW	Same	-13,110 kW
Corrected Net Output:	474,208 kW	483,297 kW	474,208 kW

The following data applies to the heat and mass balance calculations for a single unit at average annual conditions and based on new and clean performance values:

Heat Rate (higher heat value):	7,222 Btu/kWh
Heating value of natural gas:	
LHV	20,684 Btu/lb
HHV	22,932 Btu/lb
Inlet gas pressure:	415 psia
Gas Turbine Exhaust Flow	3,408,500 lb/hr
Air Flow	3,305,300 lb/hr
Gas turbine gross capacity:	157,404 kW
Steam turbine gross capacity:	86,255 kW
Steam turbine exhaust pressure:	1.6" Hga
Total plant auxiliary loads	see Table B-3

Annual Generation

Operating at 487.3 MW and an expected lifecycle average capacity factor of 93%, the plant would produce approximately 3,970 GWh of energy per year, or 453.2 aMW.

***Fuel Chargeable to Power Heat Rate* - OAR 345-23-000(6)**

Facilities subject to the exemption from the need for facility determination under 345-23-010 (2), such as the Hermiston Generating Project, must have a fuel chargeable to power heat rate of 8000 Btu/kwh or less. OAR 345-23-000(6) defines fuel chargeable to power heat rate as the net heat rate of electric power production calculated by the following formula with all factors adjusted to International Standards Organization (ISO) standard conditions of 59°F, 14.7 pounds per square inch atmospheric pressure, and 60 percent relative humidity, during the first year of operation:

FCP = (FI-FD)/P, where

FCP = Fuel chargeable to power heat rate,

FI = Annual fuel input to the facility applicable to the cogeneration process in British thermal units (higher heating value),

FD = Annual fuel displaced in any industrial or commercial process, heating or cooling application by supplying useful thermal energy from a cogeneration facility instead of from an alternate source, in British thermal units (higher heating value), and

P = Net annual electric output of the cogeneration facility in kilowatt hours.

The most conservative value for fuel chargeable to power under the conditions specified in OAR 345-23-000 is calculated with no steam to process and no credit for annual fuel displaced by steam supplied to process (FD=0), and P given as the facility's net output, rather than the gross output. Under these assumptions the facility's net electrical output is 475.85 MW, the total fuel required is 3,292 MMBtu/hr, and the fuel chargeable to power heat rate is 7,081 Btu/kwh. Under these ISO conditions the facility's output with auxiliary loads supplied by others is 488.96MW.

Fuel Chargeable to Power Heat Rate Under Expected Operating Conditions -- Project Order Addendum 2 Paragraph III.B,C,F

A number of factors impact the fuel chargeable to power heat rate, including steam to process, temperature, elevation, and load. The Project Order requires that the impact on the fuel chargeable to power heat rate of use of the auxiliary boiler, expected facility operating conditions, and expected steam demand variation be evaluated. Table B-1 shows the fuel chargeable to power heat rate under a range of conditions and assumptions selected to yield higher values for fuel chargeable to power heat rate than any expected operating conditions. In no case evaluated does the fuel chargeable to power heat rate exceed 8,000 Btu/kwh

Impact of Auxiliary Boiler Operation -- Project Order Addendum 2 Paragraph III.B

Use of the auxiliary boiler for steam supply increases the fuel input (FI) to the facility; however, this increase is directly offset by the fuel displaced in the industrial process (FD) due to the steam supply from the auxiliary boiler. Thus, use of the auxiliary boiler does not increase the fuel for power production or the fuel chargeable to power heat rate.

Impact of Steam Supply -- Project Order Addendum 2 Paragraph III.F

For each case in Table B-1, a single generating unit is considered, net annual electric output (P) of that unit is derated by 8.8 MW, an amount corresponding to steam supply at 70,000 lb/hr. This is a conservatively high value for annual average derate as it assumes steam delivery at near peak capacity through the year with no process down time; the actual annual average steam use is expected to be approximately 43,800 lb/hr. This assumption will yield a conservatively high value for fuel chargeable to power heat rate. Further, although a power derate due to process steam supply is assumed, no corresponding credit is taken for fuel displaced by the process steam supply (FD=0). While this combination is unrealistic, it is sufficiently conservative to cover all reasonably possible steam supply scenarios. Finally, the fuel chargeable to power heat rate is calculated based on a single generating unit, even though with one unit supplying all of the process steam requirements, the second generating unit would operate producing electricity only and would not experience this derate, improving the overall facility fuel chargeable to power.

Table B-1 shows that the fuel chargeable to power heat rate does not exceed 8,000 Btu/kwh under even these very conservative steam supply assumptions.

Impact of Expected Operating Conditions -- Project Order Addendum 2 Paragraph III.C

Table B-1 provides fuel chargeable to power heat rate values for a range of operating conditions based on single generating unit. Each case in Table B-1 incorporates the conservative steam supply assumptions described above; bases for other assumptions are described below. In each case assumptions are sufficiently conservative to capture the realistic range of possibilities.

Adjusting the assumed elevation from the ISO value of sea level to the 600' elevation at the plant site decreases the plant output but does not materially change efficiency or fuel chargeable to power heat rate. However, under summer conditions, increased ambient temperature and decreased load effectively increase the fuel chargeable to power heat rate. Temperature scenarios of 30°F and 90°F are examined as representative of winter and summer conditions, respectively.

As reduced-load operation will tend to increase fuel chargeable to power heat rate, a reduced load (85% power) case was evaluated. The facility may operate at partial load under certain circumstances such as during partial equipment failures. However, the facility is not expected to

operate at less than 85% load and would not operate at this level for more than about 20 percent of the year.

As can be seen from the table, using conservative assumptions the fuel chargeable to power heat rate in all cases is less than 8,000 Btu/kwh. Thus, under all expected operating conditions, the fuel chargeable to power heat rate is expected to stay below 8,000 Btu/kwh.

Figure B-1a is a process flow diagram for the facility. Points on the process flow diagram are keyed to mass and energy values in Table B-2 which were used for fuel chargeable to power heat rate calculations for each of the operating scenarios in Table B-1.

TABLE B-1
Fuel Chargeable to Power (FCP) Heat Rate
(70,000 lb/hr of steam to process)

Condition	Total Fuel Consumed (MMBtu/hr)	Net Power Output (Kilowatts)	FCP Heat Rate (Btu/kwh)HHV
ISO: 59°F, Sea Level, 60% RH	1,718.5	229,000	7,502
ISO adjusted to site elevation of 600 feet	1,679.3	223,700	7,506
Winter Conditions: 30°F @ site elevation	1,800	240,700	7,480
Summer Conditions: 90°F @ site elevation	1,543.3	198,800	7,763
Partial Load: 85% output @ ISO*	1,546.7	193,725	7,984
Avg. Ann. Conditions: 53°F & 55% R.H. @ Site Elevation **	1,712.3	237,100	7,222

* Assumes 65,000 lb/hr of steam to process at part load operating conditions.

** As suggested by ODOE, this case does not include steam to process

Operating Basis

The Project will provide firm energy and capacity substantially at the stated capacity level. However, the output of any gas turbine exhibits a slight inverse variation with temperature, and there will be a slight seasonal variation in energy and capacity from the Project.

GENERAL DESIGN DRAWINGS - OAR 345-21-015(1)(b); PROJECT ORDER PARAGRAPH 14.B.

The following general design drawings of the Project structures, equipment and their appurtenances are provided:

Figure B-1a	Process Flow Diagram
Figure B-2a,2A	Site Plan
Figure B-3	Elevation Diagram
Figure B-4	Electrical Single Line
Figure B-5	Interconnection Schematic
Figure B-6	Typical Transmission Poles

The site plan and elevation diagrams include conceptual design drawings of the energy facility structures. The types of structures and their occupancy is described in this Exhibit B.

PROJECT ORDER, PARAGRAPH 14.A, ADDENDUM 2 PARAGRAPH II.A

Applicant intends to comply with all applicable federal, state, and local safety codes and standards for construction of the facility, transmission line, and gas pipeline normally utilized in the design and construction of this type of facility, including the National Electric Safety Code (NESC), Uniform Building Code ("UBC"), the Federal DOT Pipeline Safety Regulations, and specialty codes administered through the American Society of Mechanical Engineers ("ASME") and the American National Standards Institute ("ANSI"). In OAR 860-24-020, OPUC adopts by reference the U.S Department of Transportation's safety standards under the Natural Gas Pipeline Safety Act. In OAR 860-24-010, OPUC adopts by reference the standards prescribed by the 1990

Edition of the American National Standard, National Electrical Safety Code approved June 26, 1989 by the American National Standards Institute. Applicant certifies that it will construct the gas pipeline and transmission line or cause the gas pipeline and transmission line to be constructed in accordance with the applicable safety standards.

The Applicant will comply with UBC Chapters 79 (Hazardous Materials) and 80 (Flammable Liquids), and NFPA Standard 580 (Fire Protection for Combustion Turbines). Where the applicable Oregon codes specify added conditions or more stringent requirements, these requirements will be incorporated into the facility's design during the detailed design phase of the Project.

Structural, Wind and Seismic

Structural, wind and seismic design will be in accordance with the 1991 UBC and the State of Oregon Amendments "Structural Specialty Code" 1993 Edition. Specific recognition of the wind and seismic criteria applicable to the Project is noted as follows:

Wind

Umatilla County is recognized as being a high wind area as noted in Figure No. 23-1 of the Oregon Amendments to the UBC. Appropriate design conditions include:

Minimum Basic Wind Speed:	90 mph
Exposure C	
Importance Factor	1.15

Seismic

The 1993 Oregon Amendments to the UBC recognize Umatilla County as a seismic zone 2B. Accordingly the basic seismic design will be:

Seismic Zone	2B
Importance Factor	1.25 (highest value)

Boiler and Pressure Vessel Codes

The primary design basis will be the ANSI and ASME Codes for Unfired Pressure Vessels and Piping. Other codes will be applied as applicable.

Fire and Life Safety

Fire Protection

The Hermiston Project will meet the requirements of the UBC as amended by Oregon, and the NFPA.

A comprehensive on-site fire protection system will be installed to control and extinguish fires within the buildings and yard areas. The system will be designed to conform with the Uniform Fire Code and all applicable fire protection standards. It will include a capability to control fires by means of a fire water system, a dry chemical extinguishing system, a CO_2 extinguishing system, and portable fire extinguishers. Appropriate response to the range of potential fire situations at the energy facility will, therefore, be possible.

The fire water system will include a fire water supply loop, fire hydrants, sprinkler systems, and hoses placed at key locations. An underground fire main pipeline will be constructed, and hydrants with associated hose stations at appropriate intervals will be strategically located throughout the HRSG, turbine and natural gas handling areas. The two 500,000 gallon raw water storage tanks will serve as fire water storage.

The turbine housings, the mechanical and the electrical/control enclosures of the turbines, the battery room, and the switchgear room will be protected by foam or CO_2 fire protection systems. Upon actuation, an alarm or visual indicator will be activated on the gas turbine control panel.

To supplement the other fire prevention systems, portable fire extinguishers will be provided at key locations within the facility. The type and number of extinguishers will satisfy all applicable code requirements.

Medical Facilities

First aid kits, eyewash stations, and drench showers will be provided throughout the facility. This will facilitate rapid medical response in an emergency situation.

FACILITY CONSTRUCTION SCHEDULE

The Project development timetable envisions financial closing by early 1994 and commercial operation by early 1996. The total construction period is estimated to be approximately 25 months. A more complete discussion of the construction schedule is provided in Exhibit X.

The construction work force is expected to average approximately 120 personnel over the 25 month construction period, with a peak work force of 200. The work force is expected to start at less than 50 during initial mobilization for clearing and rough grading. Construction activities will include the following:

- Set-up and assembly of temporary office and warehouse;
- Installation of temporary utilities (electricity, water, phone, sewage);
- Preparation of construction parking and equipment staging areas;
- Site preparation;
- Preparation of erosion and sedimentation control measures;
- Disposal of wastes during construction;
- Excavation and construction of foundations; and
- Erection of permanent Facility components.

PROJECT OPERATION AND OCCUPANCY

The Project will be designed to operate continually (24 hours per day, seven days per week) to provide baseload power. The operational labor force will consist of approximately 25 permanent full-time employees, with the majority working the normal day shift (8:00 AM to 4:30 PM). The remaining employees will perform shift work to maintain a 24-hour operation.

The control and warehouse/office structures will generally be occupied on a continuous basis. The combustion turbine and steam turbine structures will generally not be occupied, except during maintenance, testing, and inspection activities.

Table B-2
FLOWSHEET DATA

CASE: #1. ISO CONDITIONS; SEA LEVEL									
Point		Air	1	2	4	5	6	5A	
Description		Ambient Air Inlet	Fuel input	Combined Cycle Gross Power	Auxiliary Power	Net Output Electricity Only	Steam to Process	Net Output with Process	
Mass Flow	1000 lb/hr						70		
Enthalpy	Btu/lb						1,202		
Temperature	Deg. F	59					408		
Pressure	psia	14.7					265		
Fuel Flow	MMBtu/hr (HHV)		1,718						
Power	kW			244,478	(6,555)	237,923	(8,864)	229,059	
Net Heat Rate	Btu/kwh (HHV)					7,223		7,502	

CASE: #2. ISO TEMPERATURE; ADJUSTED TO SITE ELEVATION									
Point		Air	1	2	4	5	6	5A	
Description		Ambient Air Inlet	Fuel input	Combined Cycle Gross Power	Auxiliary Power	Net Output Electricity Only	Steam to Process	Net Output with Process Steam	
Flow	1000 lb/hr						70		
Enthalpy	Btu/lb						1,202		
Temperature	Deg. F	59					408		
Pressure	psia	14.38					265		
Fuel Flow	MMBtu/hr (HHV)		1,679						
Power	kW			239,156	(6,555)	232,601	(8,864)	223,737	
Net Heat Rate	Btu/kwh (HHV)					7,220		7,506	

Table B-2
FLOWSHEET DATA

CASE: #3. WINTER SITE CONDITIONS									
Point		Air	1	2	3	5	6	5A	
Description		Ambient Air Inlet	Fuel input	Combined Cycle Gross Power	Auxiliary Power	Net Output Electricity Only	Steam to Process	Net Output with Process	
Flow	1000 lb/hr						70		
Enthalpy	Btu/lb						1,202		
Temperature	Deg. F	30					408		
Pressure	psia	14.38					265		
Fuel Flow	MMBtu/hr (HHV)		1,800						
Power	kW			256,072	(6,555)	249,517	(8,864)	240,653	
Net Heat Rate	Btu/kwh (HHV)					7,214		7,479	

CASE: #4. SUMMERTIME @ 90 deg F AMBIENT									
Point		Air	1	2	4	5	6	5A	
Description		Ambient Air Inlet	Fuel input	Combined Cycle Gross Power	Auxiliary Power	Net Output Electricity Only	Steam to Process	Net Output with Process	
Flow	1000 lb/hr						70		
Enthalpy	Btu/lb						1,202		
Temperature	Deg. F	90					408		
Pressure	psia	14.38					265		
Fuel Flow	MMBtu/hr (HHV)		1,543						
Power	kW			214,210	(6,555)	207,655	(8,864)	198,791	
Net Heat Rate	Btu/kwh (HHV)					7,432		7,763	

Table B-2
FLOWSHEET DATA

CASE: #5. PART LOAD ISO CONDITIONS (85% OF BASE)									
Point		Air	1	2	4	5	6		
Description		Ambient Air Inlet	Fuel input	Combined Cycle Gross Power	Auxiliary Power	Net Output Electricity Only	Steam to Process	Net Output with Process	
Flow	1000 lb/hr						70		
Enthalpy	Btu/lb						1,202		
Temperature	Deg. F	59					408		
Pressure	psia	14.7					265		
Fuel Flow	MMBtu/hr (HHV)		1,547						
Power	kW			207,806	(5,850)	201,956	(8,231)	193,725	
Net Heat Rate	Btu/kwh (HHV)					7,659		7,984	
CASE: #6. ANNUAL AVERAGE AMBIENT (Based on General Electric Co. Data) AT SITE ELEVATION / ZERO STEAM TO PROCESS (Corrected to 52.8 Deg. F,, 1.6"Hg ST Back Pressure & 55% RH)									
Point		Air	1	2	4	5	6		
Description		Ambient Air Inlet	Fuel input	Combined Cycle Gross Power	Auxiliary Power	Net Output Electricity Only	Steam to Process		
	Units								
Mass Flow	1000 lb/hr						None		
Enthalpy	Btu/lb								
Temperature	Deg. F	52.8							
Relative Humidity		55%							
Pressure	psia	14.38							
Fuel Flow	MMBtu/hr (HHV)		1,712						
GE Base Power @ 50 Deg (kW)				244,430					
Adjust for lower Condenser pressure				700					
Correct for 52.8 deg amb. (0.994)				(1,471)					
Correct for 55% RH (1.00)				0					

Table B-2
FLOWSHEET DATA

Average Annual Output		243,659	(6,555)	237,104			
Net Heat Rate	Btu/kwh (HHV)			7,222			
Higher Heating Value of NG = 22,932 Btu/lb							

Table B-3
Auxiliary Power Requirements

	Power Use (kW)
Gas Turbine	535
GT Water Injection Sys.	
Air compressor	
Lube Oil Pump	
Hydraulic Pump	
Mist Eliminator Fan	
Fuel Pumps	
Fuel Forwarding pps	
Compartment Ventilation Fans	
Exhaust Frame Blowers	
Controls & Instrumentation	
Generator Excitation Power	
Steam Turbine & Generator	50
Bearing & Seal Oil Pumps	
Gland Exhausters	
Vapor Extractors	
Controls & Instrumentation	
Generator Excitation Power	
Heat Recovery Steam Generator (HRSG)	170
Controls & Instrumentation	
SCR System	
Balance of Plant Auxiliary	5800
Feedwater Transfer pps	
Condensate pps	
Condenser Vacuum Pump	
Circulating Water pp	
Make-up Water Pump	
Air Compressor	
Water Treatment	
Aux Circ Water pump	
Cooling tower fans	
Step-up Transformers	
Misc Aux & Plant Lighting	
PLANT TOTAL	**6555**

Note: Values are for a single unit with N.G. fuel @ 50 degrees & site elevation

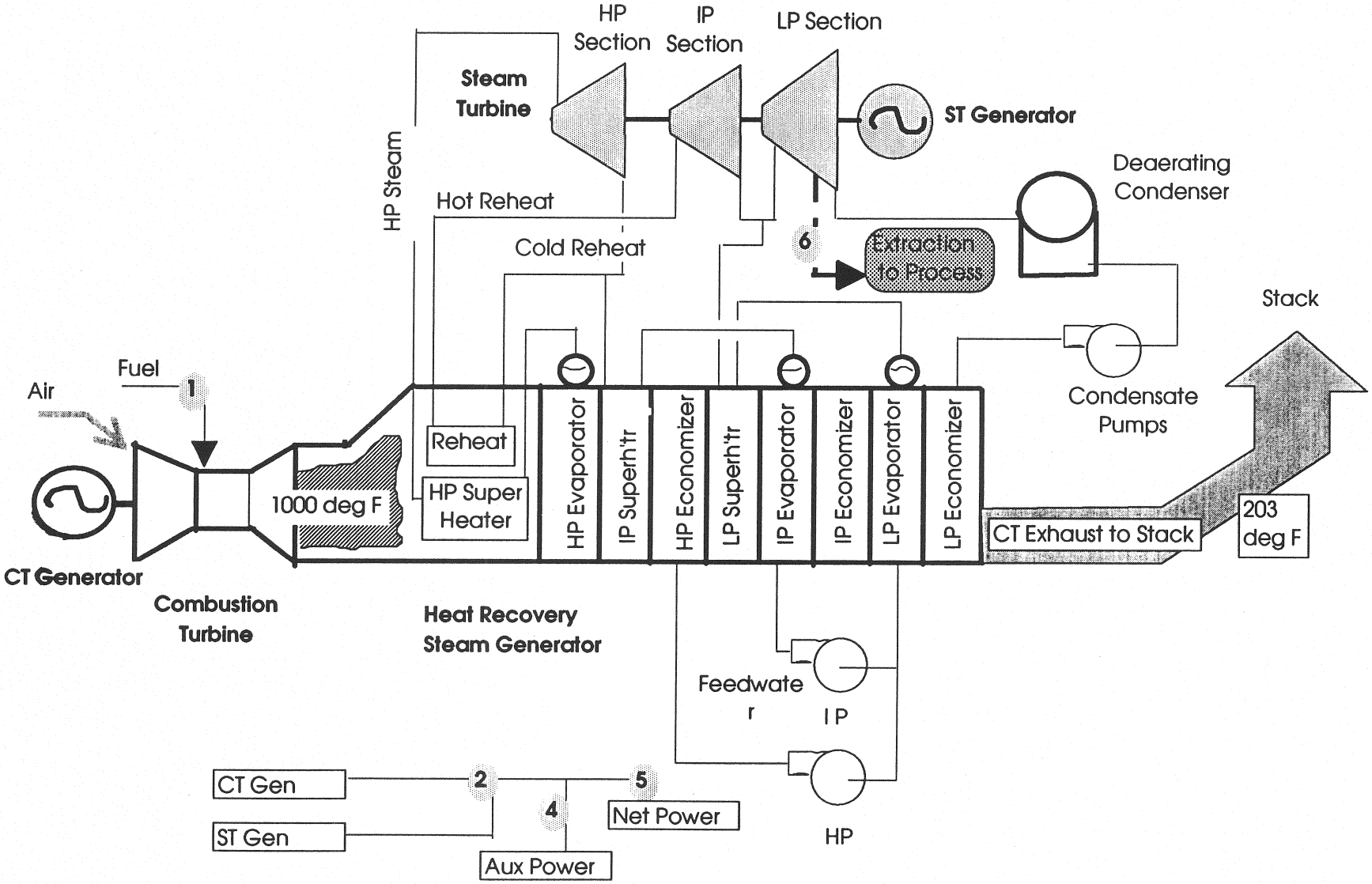

Figure B-1a
Process Flow Diagram

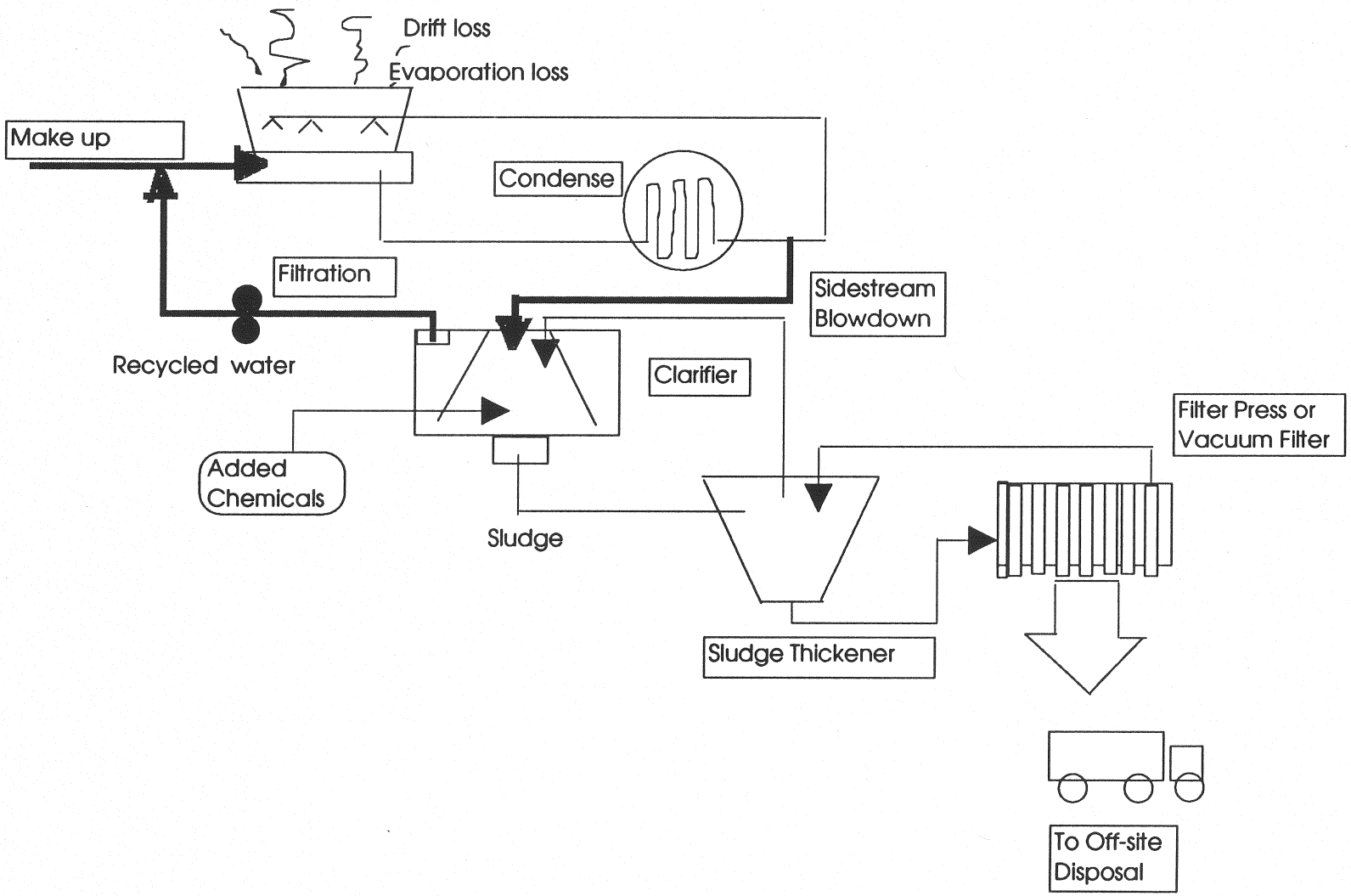

Figure B-1b: Sidestream Softener Process Flow Diagram

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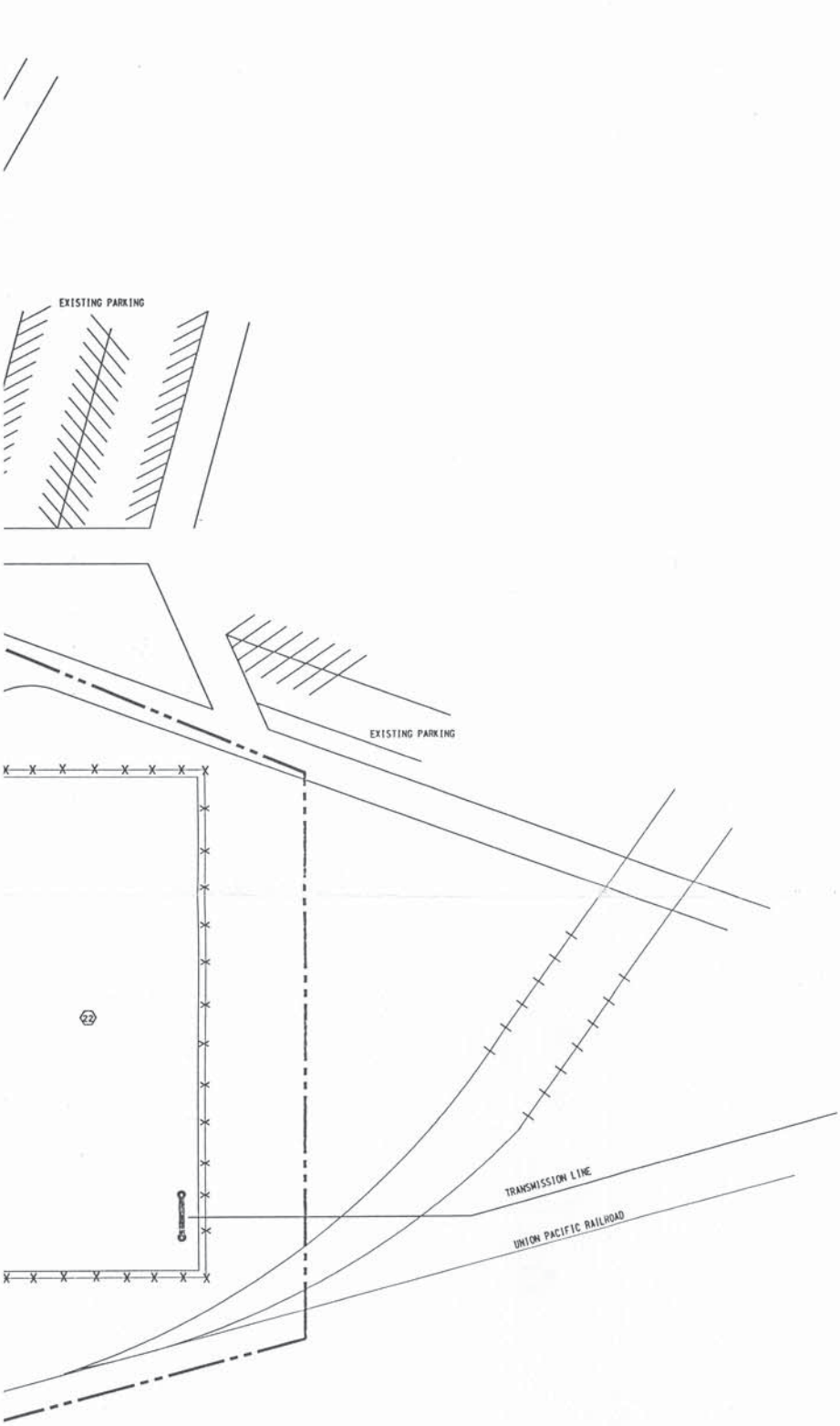


LEGEND

1. HEAT RECOVERY STEAM GENERATOR
2. COMBUSTION TURBINE BUILDING
3. STEAM TURBINE BUILDING
4. AIR INTAKE FILTER
5. FILTERED WATER STORAGE TANK
6. DEMIN./CONDENSATE STORAGE TANK
7. WASTE WATER HOLDUP TANK

11. COOLING WATER BUILDING
12. CIRC. WATER PUMP HOUSE
13. PORTABLE DEMIN. TRAILERS
14. WATER TREATMENT AREA
15. WAREHOUSE/MAINTENANCE BUILDING
16. CONTROL/ADMINISTRATION BUILDING
17. AUXILIARY BOILER
18. MAIN TRANSFORMER
19. AUX. TRANSFORMER
20. GENERATOR AUXILIARY COMPARTMENT
21. ISOLATION TRANSFORMER
22. SWITCHYARD
23. LUBE OIL TANK
24. AMMONIA STORAGE TANK
25. AMMONIA FLOW CONTROL UNIT
26. BUS AUXILIARY COMPARTMENT

NO.	DATE	REVISIONS	BY	CHK	DES. SUPV.	ENGR.	PROJ ENGR	APPR
A	2/18/93	ISSUED FOR INFORMATION	GJK					

SCALE 1"=60'-0" DATE DESIGNED FL DRAWN GJK DATE ENGR.

BECHTEL
GAITHERSBURG, MARYLAND

HERMISTON GENERATING COMPANY

SITE PLAN
DUAL 220 MW FACILITY

JOB NO.	DRAWING NO.	REV.
	B2a	A

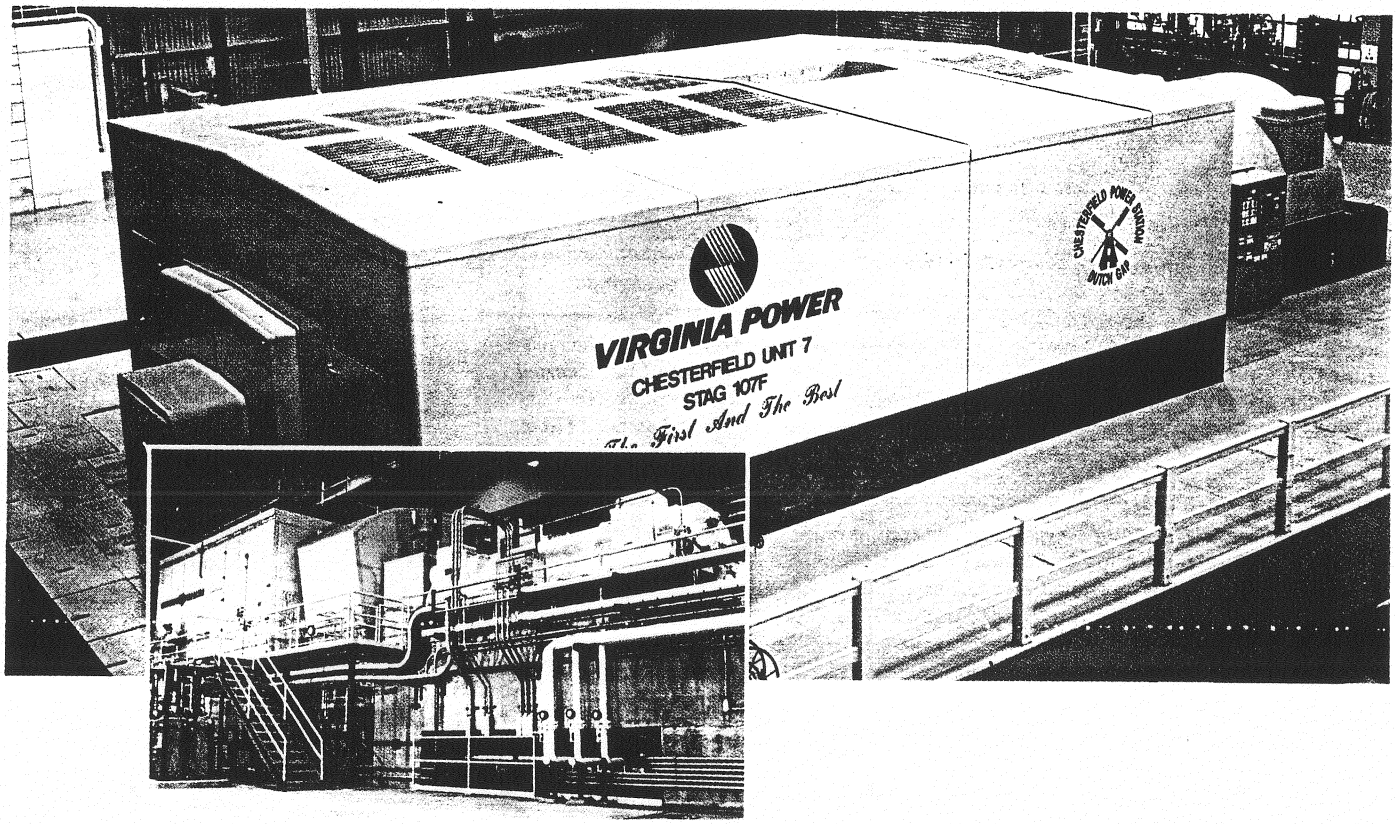
Exhibit B-1

GE Gas Turbines

The Winner: GE 7F Gas Turbine at Virginia Power

Chesterfield Unit 7 Combined-Cycle Plant, Winner of the 1991 *Power Magazine* Power Plant Award

As reported in Power Magazine, April 1991



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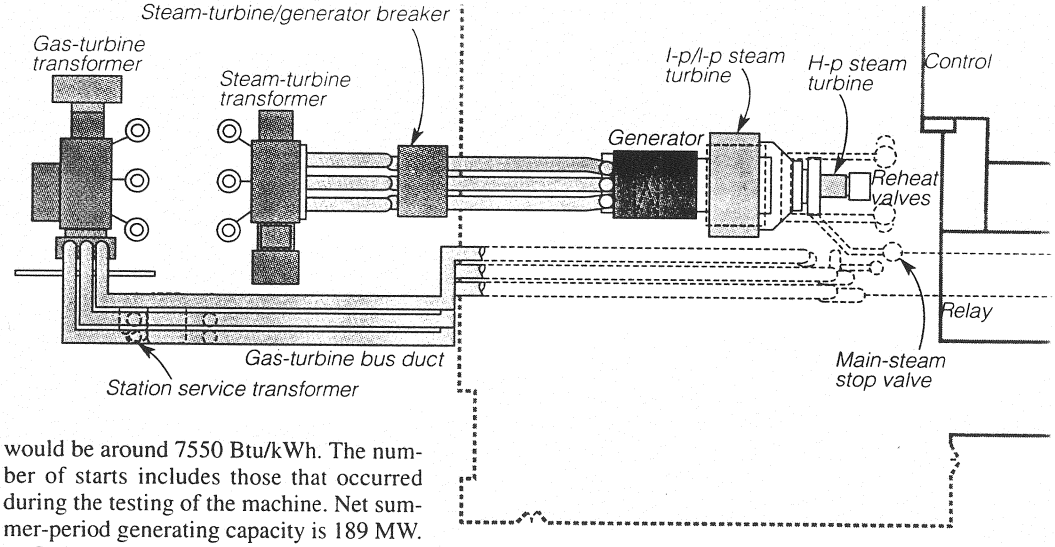
AWARD WINNER

Large, advanced gas turbine signals new era for combined cycles

The 150-MW-class gas turbine has become a commercial reality, solidifying the position of combined-cycle technology in the US powerplant market

A new phase in power generation is getting underway as the new 214-MW natural-gas-fired combined-cycle (CC) unit at Virginia Electric & Power Co's Chesterfield station (Fig 1) proceeds through its first year of operation. Anchoring the CC unit (Fig 2) is the first advanced 150-MW-class gas turbine in the US and the first heat-recovery steam generator (HRSG) with a reheat loop. Chesterfield Unit 7 is arguably the most efficient thermal powerplant of its size in the US today.

The pioneering unit rests in space formerly occupied by a 60-MW pulverized-coal-fired unit that was retired in 1982. A nearly identical additional CC unit is currently being installed for mid-1992 startup. When the second unit is complete, 430 MW of capacity will reside in essentially the same space as 130 MW did previously, a testament to the space-saving advantage of CCs. The fact that Unit 7 is Vepco's first CC unit reinforces the utility's pioneering achievement and the selection of Chesterfield for POWER's 1991 Powerplant Award.



Early operating results

Plant management indicates that initial operation from June through December last year has gone smoothly, with the following performance figures reported: Gross generation, 601,950 MWh; net generation, 580,845 MWh; average operating output, 172 MW; capacity factor, 63.5%; total equivalent availability, 78.67%; average heat rate, 8149 Btu/kWh; no. of starts, 120; start failures, 0.

The availability figure includes one scheduled inspection and overhaul that lasted five weeks. Also noted by the plant is that the heat rate is higher than what would normally be achievable for this type of unit because the fuel gas supplied to Chesterfield has to be compressed. Without the compression step, the heat rate would be around 7550 Btu/kWh. The number of starts includes those that occurred during the testing of the machine. Net summer-period generating capacity is 189 MW.

Only minor hardware glitches have occurred with the prototype commercial gas turbine—minor cracking of the ceramic lining in the combustor, burning through of the combustor liner near the nozzle area, spalling of the transition-piece coating, and cracking of the fuel nozzles. Everything has been readily repaired by the vendor. The first-stage nozzles, which take the brunt of the high-temperature combustion gases in these advanced machines, "looked terrific," says one engineer at the plant.

The HRSG also performs well, although the plant had to get past some problems with the guide vanes in the transition piece between the gas-turbine exhaust and HRSG inlet. Support pins failed repeatedly and the guide vanes kept falling. Subsequent testing demonstrated that the vanes could be removed without sacrificing performance. In the interim, however, they caused a fair amount of outage time.

Regarding the balance of plant, the fuel-gas compressor required significant attention early on. In one accident, parts of the fuel-gas-scrubber cyclone separator broke off and ultimately wrecked the rotor. Fuel compressor problems have since been resolved.

Gas-turbine design

The gas turbine at Chesterfield (Fig 3) is the culmination of a 10-yr development program conducted by the General Electric Co, Schenectady, NY. It is the latest extension of the company's 7000-series heavy-duty machines with significant input from the aircraft-derivative side of the house along with simplification features proven on the 5000- and 6000-series turbines. Examples are: Bolted-disc construction of the rotor, two-bearing system with elimination of the mid-point bearing, single-wall shell construction, shorter and heavier combustor-liner construction, six fuel nozzles instead of one, 14 combustors instead of 10, and impingement-air-cooled combustor/turbine transition pieces. For added reliability, the accessory drive and turning gear were eliminated.

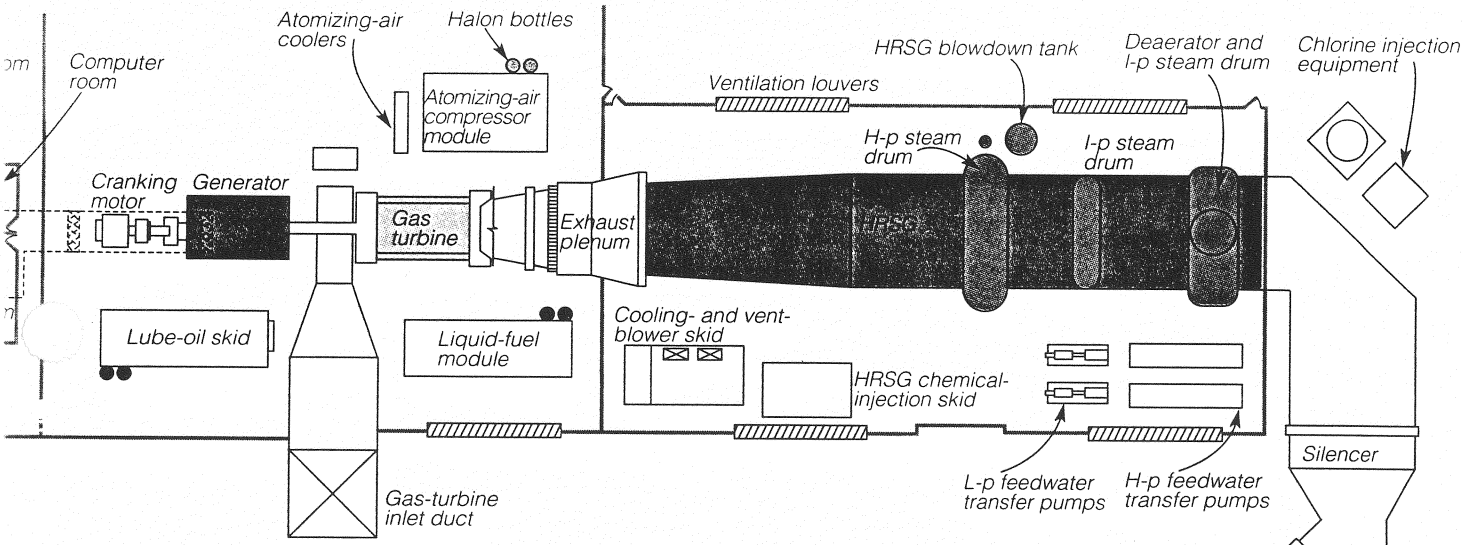
Process-wise, the cruxes of the advance-

1. CC unit at Vepco's Chesterfield station is reportedly the most efficient thermal power station of its size in the US

ment are the 2300F firing temperature, the turbine-stage cooling and protection schemes required to handle the higher inlet temperature, and the higher compression ratio. The compressor features 18 stages—one more than its predecessor—with extraction provisions at the 13th stage. Higher-strength alloys are used to withstand the larger stresses of the scaled-up compressor.

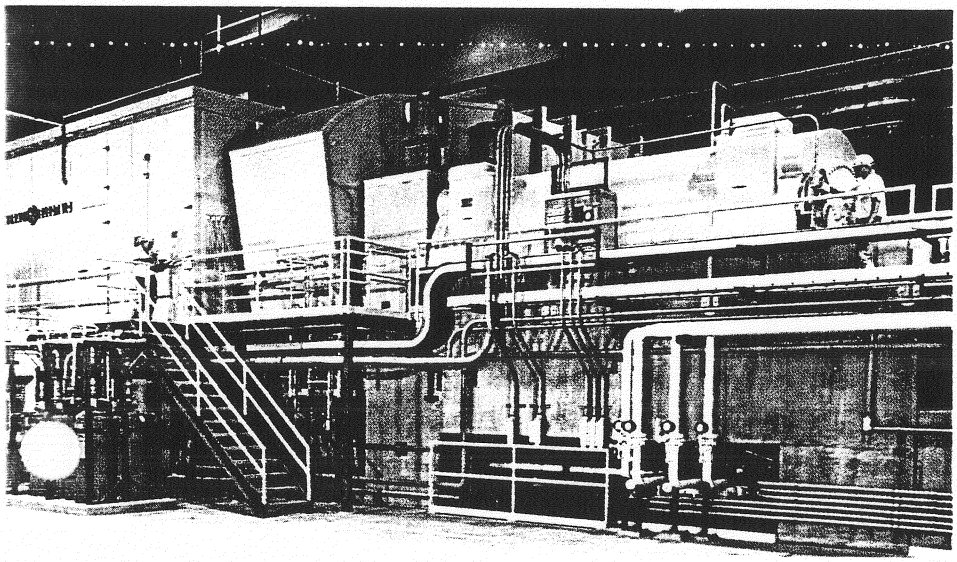
The three-stage power turbine includes 92 investment-cast blades for each stage with the first stage unshrouded and the following stages shrouded. All three nozzle stages are air-cooled as are the first- and second-stage blades. Both internal and external cooling circuits are used. First- and second-stage blades, all nozzles, and the first-stage shroud use internal convective cooling, the first- and second-stage nozzles use external-impingement and the first-stage nozzle uses film-cooling techniques. Cooling air is drawn from the compressor at the 17th stage and the discharge for the internal circuits, from the 13th stage for the external circuits.

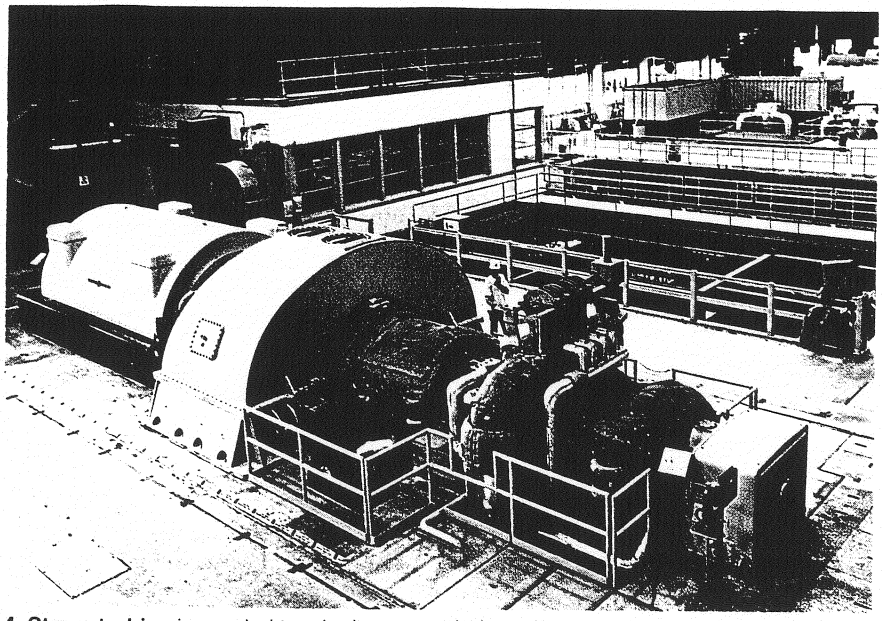
All three stages of turbine blades are coated for hot corrosion and oxidation resistance—the first two with a low-pressure plasma-sprayed coating made of cobalt/chromium/aluminum/yttrium alloy topped by an aluminide overcoat, the third stage with a high-chromium coating applied by packed cementation followed by diffusion heat treatment.



2. Plant layout (above) had to be accommodated within the constraints of the space made available by removing a 60-MW p-c-fired unit

3. The 150-MW gas turbine is 30% larger and more efficient than units available just several years ago (below)





4. Steam turbine is coupled to a hydrogen-cooled synchronous generator with four corner-mounted coolers

In addition to natural gas, the turbine is fully capable of firing distillate, the backup fuel, or a range of primary/secondary fuel mixtures. The combustor can be easily adapted to fire gasified coal should that be desirable in the future. Guaranteed NO_x emissions for natural-gas firing are 42 ppm, 77 ppm for distillate. Rated output is slightly less when firing distillate.

Steam-system details

Exhaust at 1100F flows axially from the gas turbine to the HRSG, supplied by Henry Vogt Machine Co, Louisville, Ky, where it produces 1450-psig/950F main steam and 300-psig/950F reheat steam. The HRSG is a three-pressure, unfired, natural-circulation boiler with integral deaerator. In addition to supplying the 64-MW steam turbine (Fig 4), also provided by GE, the HRSG produces steam that is injected into the gas-turbine combustor for NOx abatement. Around 400,000 lb/hr is delivered to the steam turbine, 100,000 lb/hr of 380-psig/500F steam to the gas-turbine combustor, and 80,000 lb/hr of low-pressure steam to the deaerator.

According to Vogt, the position and location of the superheater and reheater are critical when reheat/superheat temperatures are identical. A series arrangement with sections divided into a number of alternating subsections proved optimum. Parallel sections were rejected because of steam distribution problems. Control of superheat temperature is accomplished with spray-water attemperation. It reportedly offers a wider control range and better distribution. Spray water is taken from the feedwater pumps.

The HRSG has a low-pressure economizer to heat incoming feedwater. When the CC unit fires natural gas, this increases efficiency by further reducing turbine exhaust temperature. During oil firing, the economizer is allowed to run dry to prevent acid condensation. Final stack temperature is normally around 270F. Note that there is no provision for bypassing the HRSG and operate the gas turbine/generator in the simple-cycle mode.

The steam turbine is a single-flow straight condensing machine exhausting into a new condenser supplied by Ecolaire Inc. It rests on the slightly modified pedestal and in the building of the former unit. Some cooling water intake and outfall structures and piping were reused. Condensate pumps are also located in the steam-turbine building.

Balance-of-plant

Air for the gas turbine is taken through an inlet filter located on the roof of the gas-turbine building. The filtration system was designed to accommodate the dusty environment arising from p-c firing at the other four Chesterfield units. Unit 7 is adjacent to the station coal pile.

A 413-ft concrete stack with an insulated steel liner accepts exhaust from the CC unit and will also handle exhaust from the new CC unit. The Unit 7 exhaust duct includes a damper which will be used to isolate the two units.

Natural-gas fuel is provided from a new pipeline which ties both units into a nearby supply line. The centrifugal compressor, equipped with fuel gas scrubber, is designed so it can be cross-connected with the Unit 8 compressor. An existing 11-million-gal oil storage tank was refurbished for Unit 7 and a new adjacent 11-million-gal tank will serve Unit 8, although the tanks will be cross-connected for operating flexibility.

Edited by Jason Makansi

GE Industrial & Power Systems

For more information write:
GE Power Generation
One River Road (2-103)
Schenectady, NY 12345

GER 3681 (6/91)

Exhibit B-2

GE Industrial &
Power Systems Sales

Industry Sales Department
General Electric Company
P.O. Box 8029, Walnut Creek, CA 94596-1229
510 256-2451

April 16, 1993

Mr. Peter Evans
U. S. Generating Company
444 Market Street, Suite 1900
San Francisco, CA 94111

SUBJECT: U.S. Generating Company/Hermiston Cogen Project
MS7001F (A) and Advanced Combined Cycle Experience

ATTACHMENTS:
1. F Technology Reference List
2. Chesterfield #7 & #8 Operating Experience
3. Single Shaft Configuration Experience

Dear Peter:

The following is a summary of the current operating experience of the MS7001F (A) Gas Turbine Generator and STAG 107FA.

GENERAL BACKGROUND

The MS7001F (A) design is the latest derivation of the proven MS7001 series, with over 525 units from the family in the field. The previous model, the MS7001EA, has proven to be the industry leader in reliability and availability, averaging approximately 99% and 96%, respectively. The MS7001F (A) takes advantage of this proven design and innovations from our aircraft-derivative business, resulting in the world's most advanced commercially proven gas turbine with a current firing temperature of 2350°F and nominal rating of 159MW.

The entire design of the MS7001F (A) gas turbine, including accessories, focuses on ease of maintenance. Examples include: modularized packaging of accessory and auxiliary equipment, a two bearing system with removal of mid-point bearing, and stator casing split horizontally to provide ready access to internal parts.

OPERATING EXPERIENCE

The first MS7001F in operation was Virginia Electric & Power Co.'s Chesterfield Unit #7 on June 6, 1990. Since that date, an additional ten (10) MS7001Fs have come on-line with the first MS7001FAs scheduled for start in early 1993 at Florida Power & Light. To date we have commitments for a total of 75 "F" technology units sold by either GE or our business associates (see attachment #1). The latest operating data on the Chesterfield units have been obtained and is summarized in attachment #2.

COMBINED CYCLE EXPERIENCE: KEPCO SEOINCHON

On November 17, 1992, GE Power Generation announced at the POWER GEN '92 Conference, that combined-cycle Units #1 and #2 at Korea Electric Power Company's (KEPCO) 1,827-megawatt Seoinchon facility exceeded 55% gross thermal efficiency during recent performance tests. Also, the two STAG 107F units each had a power output of 235MW. The results of these initial tests indicate that these are the most thermally efficient power generation units in the world. The tests also illustrate that GE is on target to meet or exceed its contractual gross thermal efficiency guarantee of 54.2%, making the Seoinchon facility the most thermally efficient power plant in the world upon its completion. For each 1% of thermal efficiency, an annual plant fuel cost savings of $6.4 million can be expected, based on $5/mBTU for natural gas, with all units operating at full capacity approximately 6,000 hours each per year.

GE's Role in this Project:

GE supplied eight STAG 107F combined-cycle units. Each package includes one GE MS7001F gas turbine and one GE reheat steam turbine-generator rated at 83MWs. An exhaust gas byass stack permits each unit to generate in either simple-cycle or combined cycle operation. The plant operates on natural gas with distillate oil as a backup. To control NOx, the plant utilizes the Dry Low NOx combustion system. This plant, also, is the first to use a highly efficient GE three pressure reheat steam turbine cycle. The steam turbines are single flow machines with 33.5 inch last stage buckets. GE supplied the Mark IV gas turbine controls, DCM Plus steam turbine controls and the plant's distributed control system. GE also provided project management and engineering services for the main equipment, including general arrangement drawings, flow diagrams and other engineering and design documents, as well as overall combined-cycle design coordination.

SINGLE SHAFT COMBINED CYCLE EXPERIENCE

There is currently a total of thirty-four (34) combined cycle plants operating with the single shaft configuration (see attachment #3). The first single shaft configurations to utilize "FA" technology have been recently sold to Tokyo Electric Power Co. (8 units) and China Light & Power (8 units).

The single shaft configuration has a number of advantages over the multi-shaft configuration. The single shaft configuration allows the elimination of one generator, one control system, one lube oil system, and one transformer and auxiliaries. This translates to a reduction in capital cost and construction costs.

I hope you find this information useful. Should you need additional data or more details, please contact me.

GE is looking forward to working with U.S. Generating Company in the future as you pursue the Hermiston Cogen Project.

Yours truly,

Larry Tajiri /pl

Larry Tajiri
Turbine Sales Engineer

attachments

/USGenCo

F TECHNOLOGY R[illegible]ENCE LIST

CUSTOMER	SITE	(C = COMMIT DATE) COMM. OPN.	MFG'R	CONFIG.	CYCLE	FIRED HOURS	STARTS
VAPCO	CHESTERFIELD #7	06 JUN 90	GE	1 X 7 - F	CC	14589	113
VAPCO	CHESTERFIELD #8	31 MAY 92	GE	1 X 7 - F	CC	1763	16
KEPCO	UNIT #1	28 FEB 92	GE	1 X 7 - F	CC	1901	166
KEPCO	UNIT #2	20 MAR 92	GE	1 X 7 - F	CC	1971	191
KEPCO	UNIT #3	03 APR 92	GE	1 X 7 - F	CC	1317	147
KEPCO	UNIT #4	07 APR 92	GE	1 X 7 - F	CC	1411	138
KEPCO	UNIT #5	20 APR 92	GE	1 X 7 - F	CC	1066	121
KEPCO	UNIT #6	05 MAY 92	GE	1 X 7 - F	CC	1056	119
KEPCO	UNIT #7	30 MAY 92	GE	1 X 7 - F	CC	960	106
KEPCO	UNIT #8	01 JUN 92	GE	1 X 7 - F	CC	976	125
PEPCO	UNIT #1	01 JUN 92	GE	1 X 7 - F	SC	620	93
TEVCO	OGELTHORPE	UNSPEC.	GE	2 X 7 - F	CC		
DESTEC	PSI	UNSPEC.	GE	1 X 7 - F	CC		
SITHE	INDEPEND. POWER	01 JAN 95	GE	4 X 7 - F	CC		
DESTEC	NW	1992 - C	GE	1 X 7 - F	CC		
BG&E	PERRYMAN #1	UNSPEC.	GE	1 X 7 - FA	SC		
FP&L	MARTIN #1 & 2	1993	GE	2 X 7 - FA	CC		
PEPCO	UNIT #2	1993	GE	1 X 7 - F	SC		
BG&E	PERRYMAN #2	UNSPEC.	GE	1 X 7 - FA	SC		
CHUGOKU	YANAI.JAPAN	1994	HIT	2 X 7 - F	CC		
FP&L	MARTIN #3 & 4	1994	GE	2 X 7 - FA	CC		
PEPCO	UNIT #3	1994	GE	1 X 7 - F	SC		
BG&E	PERRYMAN #3	UNSPEC.	GE	1 X 7 - FA	SC		
CHUGOKU	YANAI.JAPAN	1995	HIT	2 X 7 - F	CC		
KANSAI	HIMEJI.JAPAN	1995	HIT	3 X 7 - FA	CC		
PEPCO	UNIT #4	1995	GE	1 X 7 - F	SC		
BG&E	PERRYMAN #4	UNSPEC.	GE	1 X 7 - FA	SC		
CHUBU	CHITA.JAPAN	1994-96	HIT	3 X 7 - FA	CC		
CHUBU	CHITA.JAPAN	1996	TOSH	1 X 7 - FA	CC		
DELAWARE	CLEAN COAL	1996	GE	1 X 7 - F	SC		
CHUBU	KAWAGOE.JAPAN	1997-99	HIT	7 X 7 - FA	CC		
EDF.	GRENNVILLIERS	15 DEC 92	EGT	1 X 9 - F	SC		
NAT. POWER	DIDCOT.UK	1994-95	EGT	4 X 9 - F	SC		
SCOTTISH HYDRO.	KEADBY.UK	1994	JBE	2 X 9 - F	CC		
AES.	MEDWAY.UK	1995	GE	2 X 9 - FA	CC		
POWER GEN.	CONNAHS QUAY.UK	1995-96	EGT	4 X 9 - F	CC		
EPON.	EEMS.NETHERLANDS	1996	EGT	5 X 9 - FA	CC		
TEPCO	YOKOHAMA 1-6	1996	GE	6 X 9 - FA	CC		
TEPCO	YOKOHAMA 7-8	1997	GE	2 X 9 - FA	CC		

POWER GENERATION STAG COMBINED-CYCLE SYSTEMS
SINGLE SHAFT CONFIGURATION

COUNTRY	UTILITY	NO. GT'S	NO. ST'S	TOTAL MW	COMMERCIAL OPERATION	TOTAL GT HOURS (JAN. 1992)
USA	WOLVERINE ELECTRIC	1	1	21	1968	151,000
USA	CITY OF OTTAWA	1	1	11	1969	103,000
USA	CITY OF CLARKSDALE	1	1	21	1972	120,000
USA	CITY OF HUTCHINSON	1	1	11	1972	70,000
USA	SALT RIVER PROJECT	4	4	290	1974	200,000
USA	ARIZONA PUBLIC SERVICE	3	3	250	1976	89,500
USA	WESTERN FARMERS	3	3	278	1977	234,700
JAPAN	TEPCO-GROUP 1	7	7	1,155	1986	203,300
JAPAN	TEPCO-GROUP 2	7	7	1,155	1988	136,300
CHINA	MPI LAMA DIEN II	1	1	50	1986	31,000
JAPAN	CHUBU ELECTRIC PWT. CO.	5	5	577	1988	109,800
JAPAN	TEPCO-ACC	8	8	2,800	1995	DESIGN

"F" Technology Operational Summary THRO Dec. 1992

# Units Opnl	Tot. Fired Hrs.	Tot. Starts
11 (7F)	36,122	1,806
1 (9F)	~300	~20
12 "F" Tech.	36,422	1,826
VAPCO (2x7F)	17,013	112
PEPCO (1x7F)	920	102
KEPCO (8x7F)	18,189	1,592
EDF (1x9F)	~300	~20

Chesterfield 7 - F-Technology Update

GE MS7-1F
(Gas Turbine/Generator Only)

VAPCO - Chesterfield - Operational "RAM"

"RAM"		CH. #7 6/6/90 THRO 12/31/9	CH. #8 5/31/92 THR 12/31/92
Reliability	(%)	98.9	89.4
Availability	(%)	91.2	90.6
Starting Reliability	(%)	93.0	79.2
Scheduled Outage Factor	(%)	7.7	4.5
Forced Outage Factor	(%)	1.1	10.6
Service Factor	(%)	71.0	36.5
Period Hours		21,315	5,160
Fired Hours		15,131	1,882
Reserve Hours		4,310	2,791
Maintenance Outage Hours		1,641	233
Forced Outage Hours		233	546
# Successful Starts		93	19
# Failures to Start		7	5
# Maintenance Outages		9	1
# Forced Outages		42	(Note 1) 10
MWH Generated		1,794,782	157,672
Avg. Fired Hours/Start		162.7	99.0

Note 1: CH. #8 was forced unavailable for 439 hrs. in Nov/Dec. 1992 to repair cracks in the exhaust diffuser supports and repair HRSG leaks.

EXHIBIT B-3

SIDESTREAM SOFTENER
CHEMTREAT, INC.

EXHIBIT B-3

CORPORATE OFFICES: P.O. BOX 27207
RICHMOND, VA 23261 • (804) 965-0505

cc: PBEVANS 4/14/93
RJGAMER

ChemTreat, Inc.

BY FAX

April 8, 1993

Mr. Fabrizio De Candia
Project Engineer
U. S. Generating Company
7475 Wisconsin Avenue
Bethesda, MD 20814

RE: Hermiston Project—Side Stream Softener

Dear Fab:

Enclosed is an estimate on the use of a side stream softener for achieving zero blowdown. This approach is becoming more common throughout the country. There are several plants we could tour as the project gets closer and zero blowdown becomes a serious option.

The enclosed estimates are conservative and based on the maximum operating conditions provided and worse case water conditions.

If you require additional or more specific information, please do not hesitate to call.

Sincerely,

CHEMTREAT, INC.

Richard W. Hildebrant
Manager, Cogeneration

Enclosure

RWH/chp

cc: Al Williams
Ray Hanley
Gil Celedonia

EXHIBIT B-3

Hermiston Project
Side Stream Softener Estimate

Single Unit

Tower Circulation	50,000 gpm
Evaporation	950 gpm
Cycles of Concentration	20 - 25*
Drift	0.5%

Typical Maximum Limits in Tower:

Total Calcium Hardness	1,200 ppm
Silica	150 ppm
T.D.S.	20,000 - 25,000

*Typical of zero discharge operation. I used 20 cycles to be conservative.

Side Stream Softener

Based on the water analyses provided and using a silica number of 13 ppm in the makeup, the following estimate is provided.

1. Calcium hardness at 20 cycles would be around 1,000 ppm, so very little, if any, calcium reduction would be required.

2. Silica at 20 cycles would be approximately 260 ppm, which would necessitate the addition of magnesium sulfate for silica reduction.

3. Some caustic, for pH control, and polymer, to aid in settling, would be required .

The clarifier would be sized at approximately 200 gpm to be conservative. Estimated capital cost would be This would include controls, clarifier, filters, thickener, and filter press.

The chemical costs would be around This includes caustic, magnesium sulfate, and polymers.

EXHIBIT B-3

cc: F. DELANDIA

Side Stream Clarifier

The primary purpose of the side stream clarifier would be to remove silica. Some calcium hardness would also be removed.

The sludge formed would be primarily magnesium silicate, with some calcium carbonate. It is estimated that the clarifier would produce 125 to 175 lbs/day of sludge at full operation.

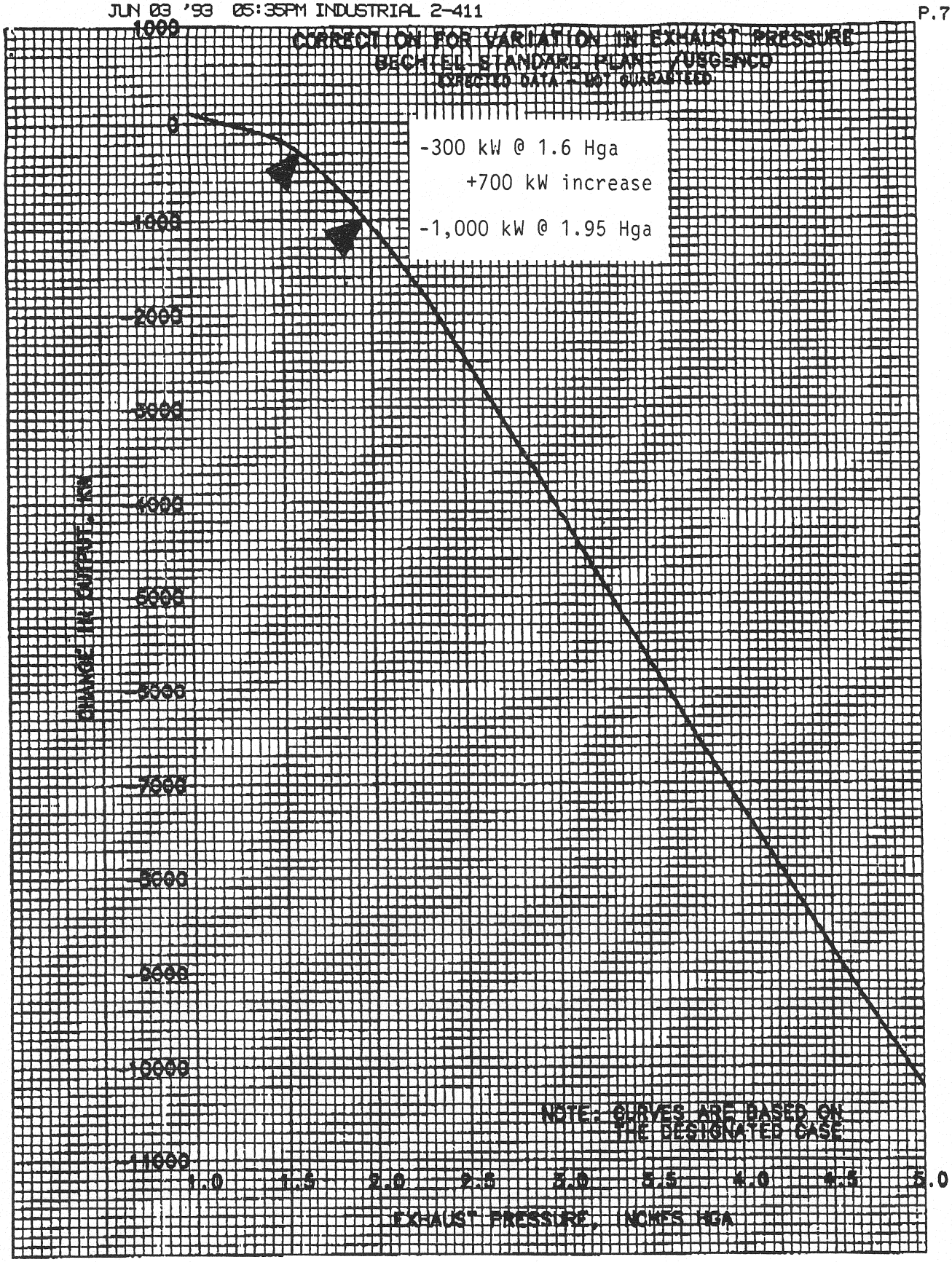
There are several plants in operation using this approach for zero discharge. Below is a partial listing of locations that may be convenient to visit.

Burney, CA
Delano, CA (outside Bakersfield)
Las Vegas, NV
Lancaster, PA

Please call if you have questions or wish to discuss a tour at one of the facilities.

EXHIBIT B-4

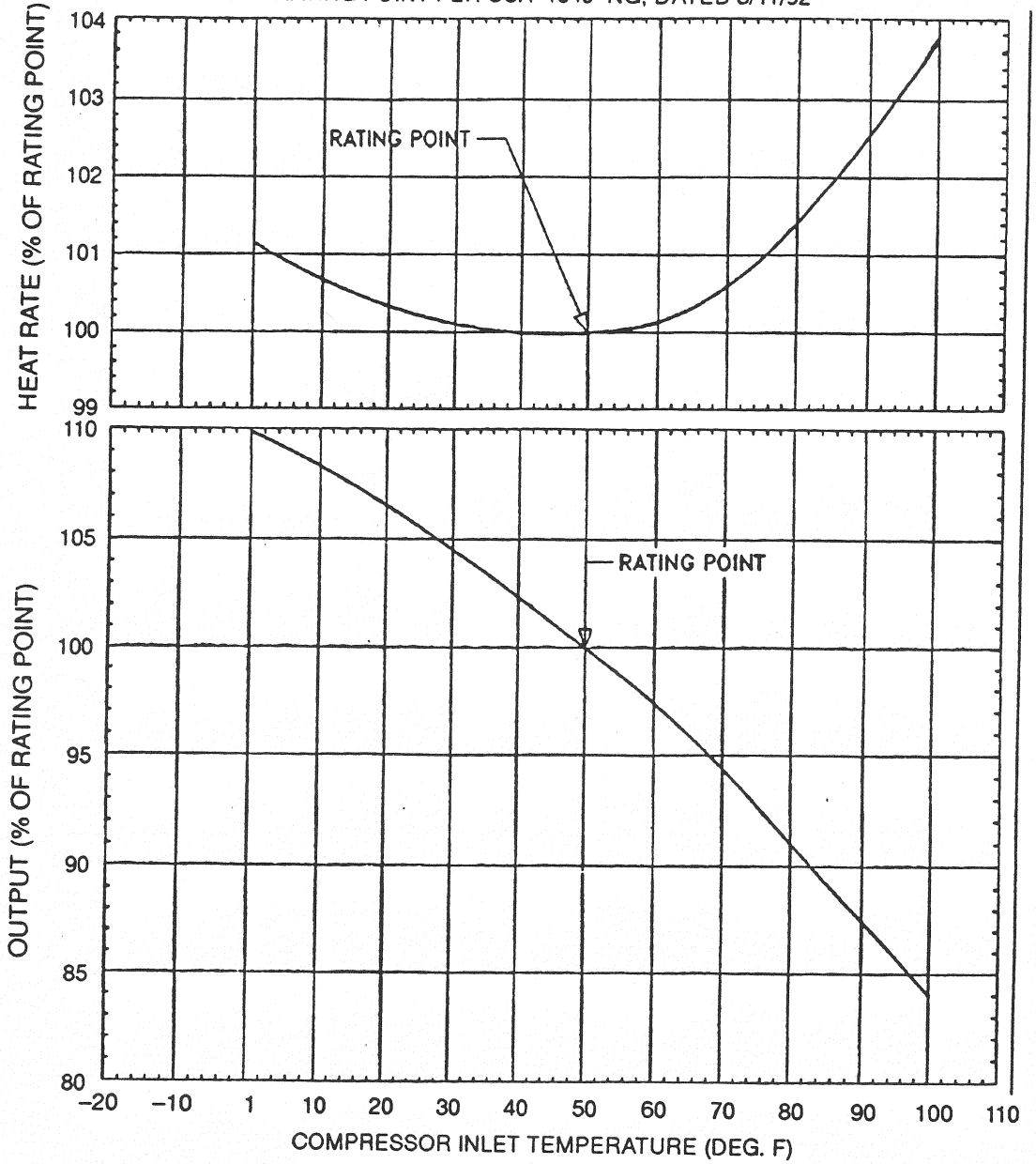
GENERAL ELECTRIC
CORRECTION CURVES


CORRECTION FOR VARIATION IN EXHAUST PRESSURE
BECHTEL STANDARD PLAN /USGENCO
CORRECTED DATA - NOT GUARANTEED
-300 kW @ 1.6 Hga
+700 kW increase
-1,000 kW @ 1.95 Hga
1000
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
-8000
-9000
-10000
-11000
CHANGE IN OUTPUT, KW
NOTE: CURVES ARE BASED ON THE DESIGNATED CASE
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
EXHAUST PRESSURE, INCHES HGA

General Electric STAG 107FA

Effect of Compressor Inlet Temperature on
Output and Heat Tate During Baseload Operation

FUEL: CUSTOMER GAS
EQUIPMENT RATING POINT PER CCA–1849–NG, DATED 8/11/92



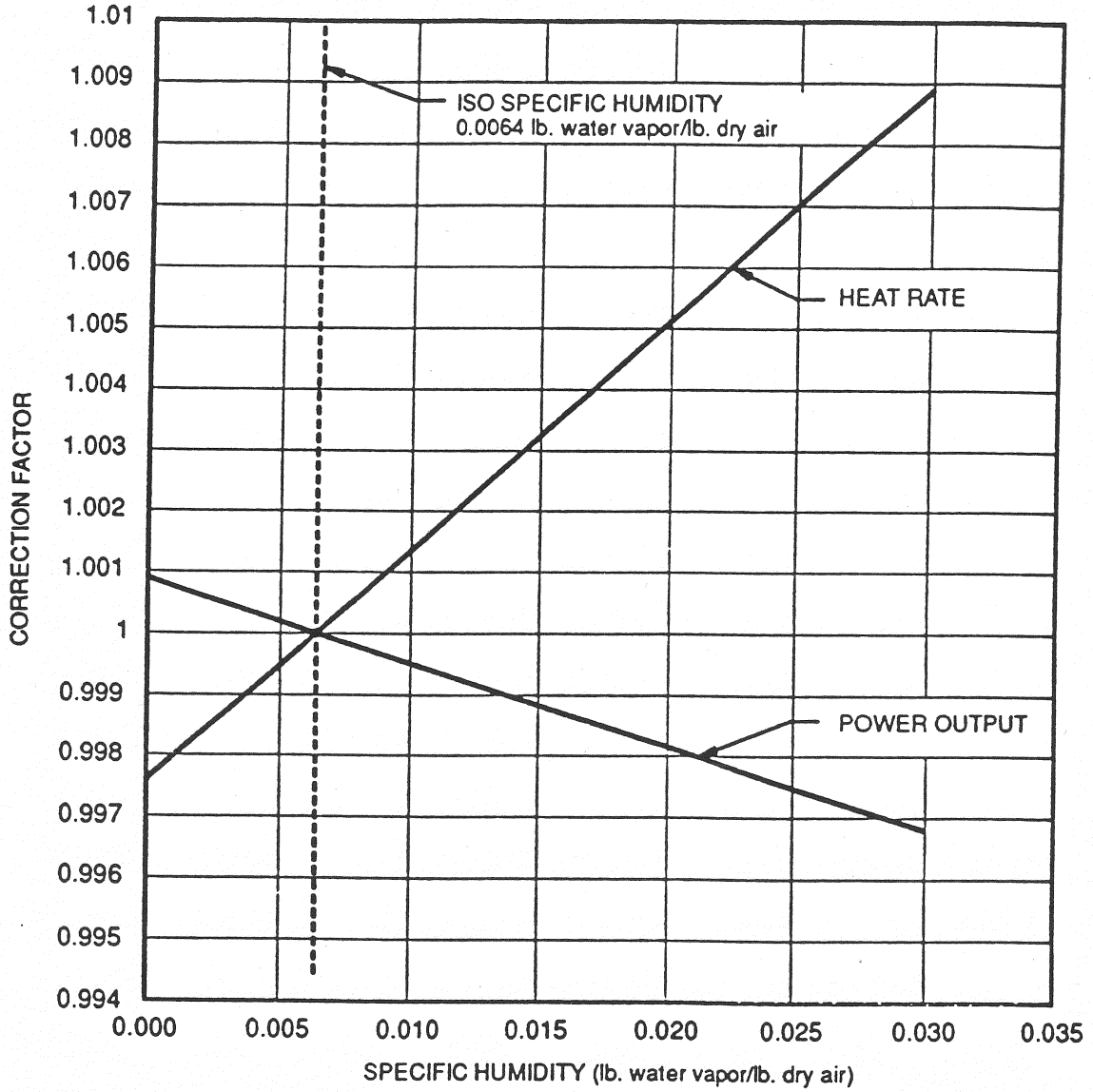
KC SHOLES
8/20/92 REV. 2

517HA450

General Electric MS6001, MS7001 And MS9001 Gas Turbines

Corrections To Output And Heat Rate
For Non–Iso Specific Humidity Conditions

For Operation At Base Load On Exhaust
Temperature Control Curve



10/10/89
DA JAQUEWAY

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REV B

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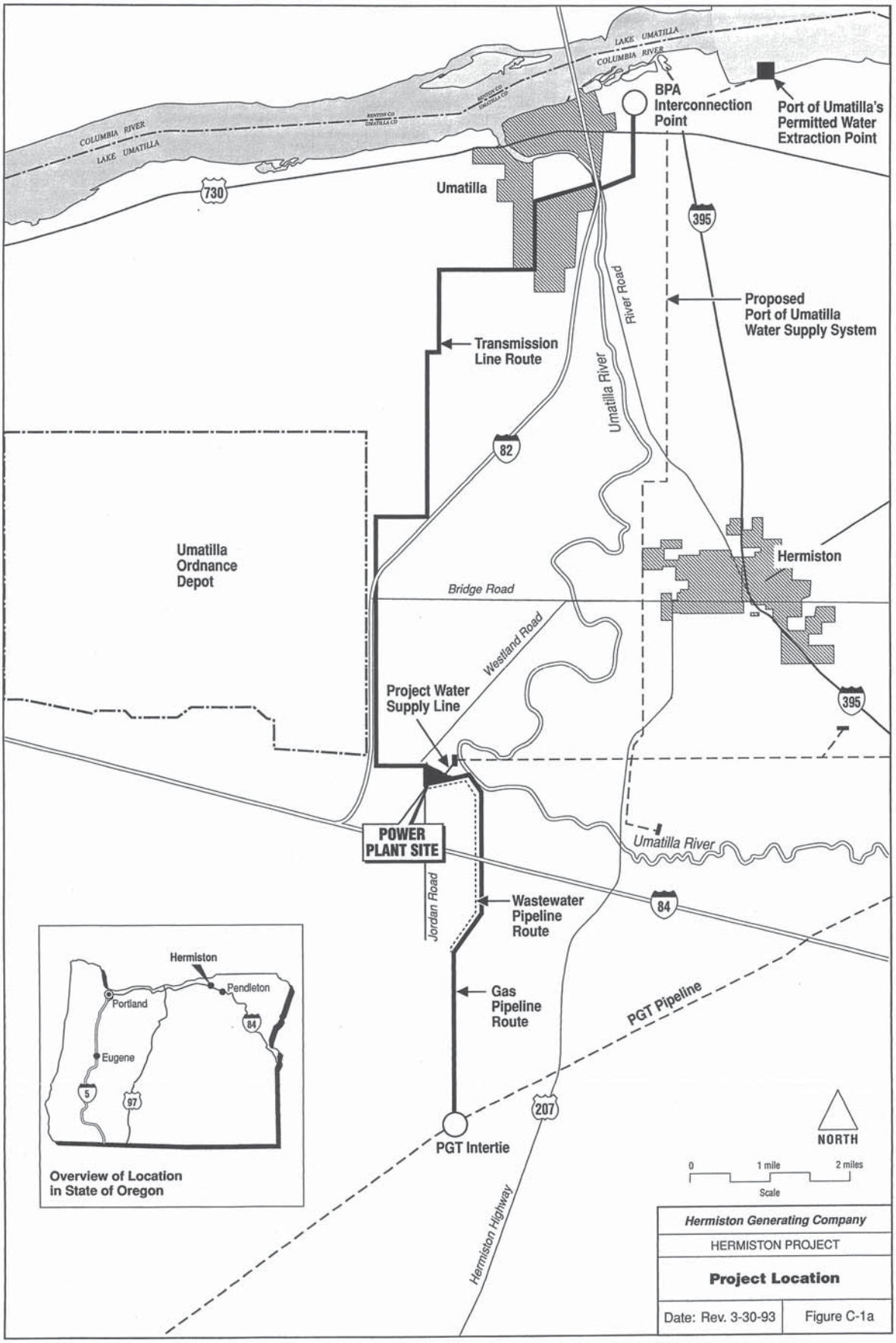
C



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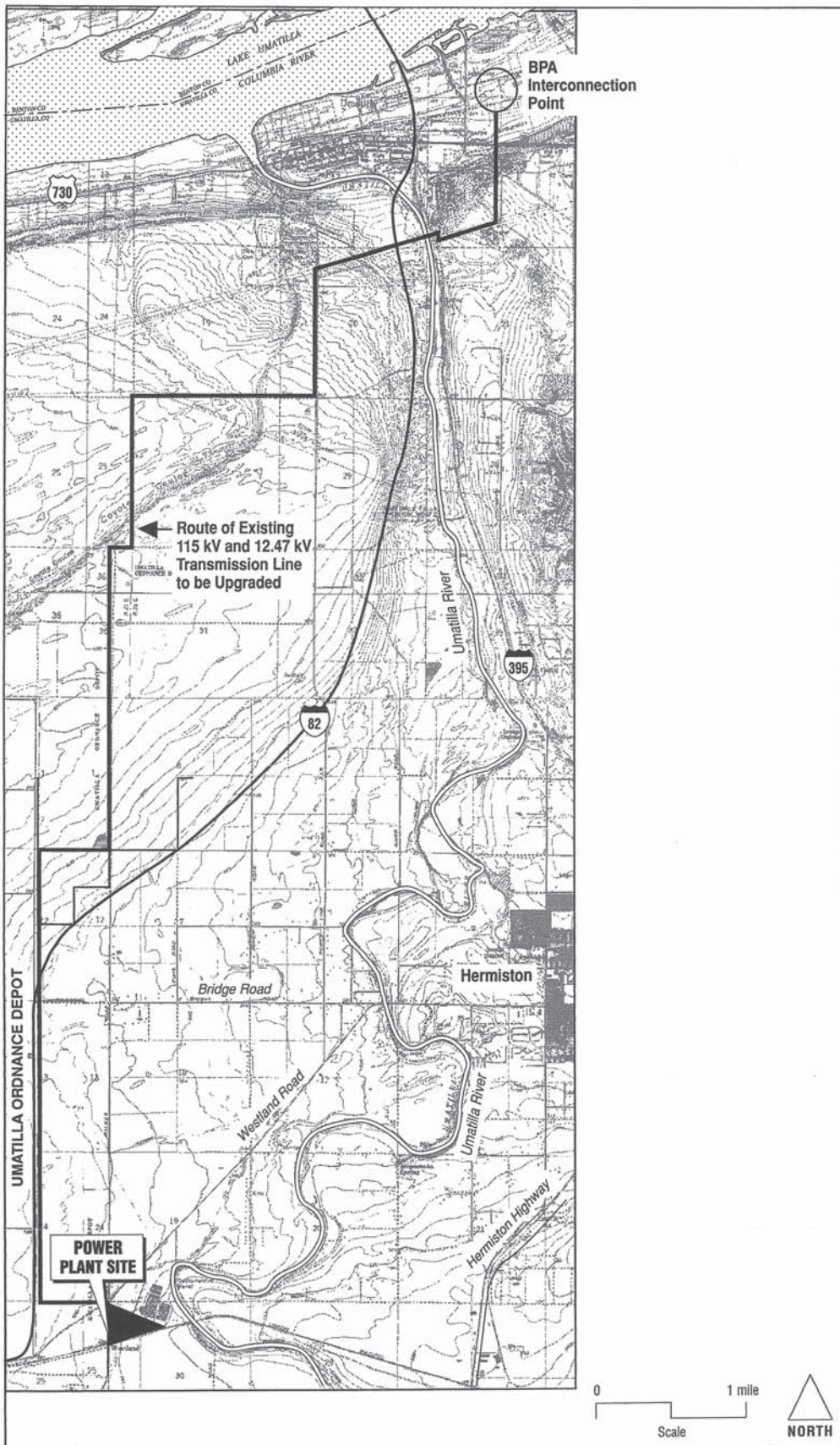
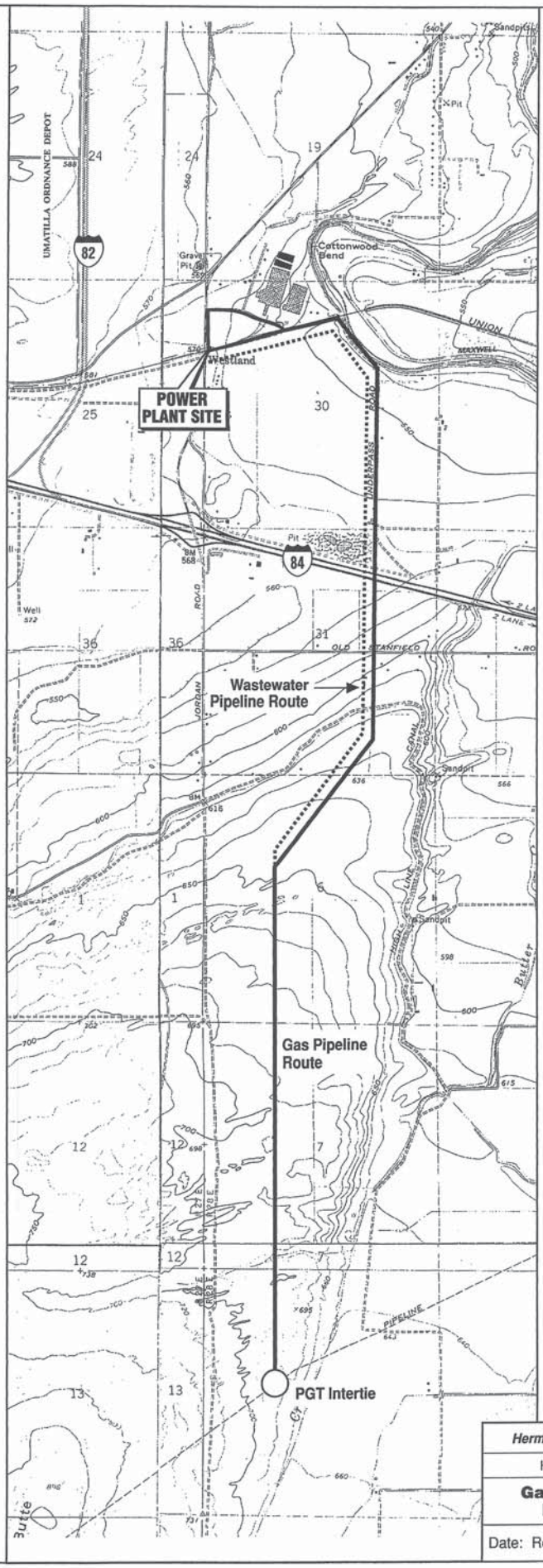


Hermiston Generating Company	
HERMISTON PROJECT	
Transmission Line Route	
Date: 12-21-92	Figure C-3a

92-4345b.025/rs/rs:7
5-10-93



0 .5 mile

Scale

NORTH

Hermiston Generating Company	
HERMISTON PROJECT	
Gas and Wastewater Pipeline Routes	
Date: Rev. 3-30-93	Figure C-4a

92-4345b.015/rs/6
5-10-93

Acrosuite Tab Page

D

construction and operation. Bechtel Power Corporation will construct the Project for Applicant. USOSC will operate the Project on a day-to-day basis for Applicant.

As described more fully below, the creation of single purpose limited partnerships to develop, construct, operate and maintain individual projects that USGen manages, Bechtel Power Corporation constructs and USOSC operates has resulted in the development of over 900 MWs of electrical generating capacity, which represents approximately $2.25 billion dollars of investment. To date, none of the special purpose limited partnerships developing these facilities have received any regulatory citations.

U.S. Generating Company

Formed in January, 1989, USGen develops, owns and operates electric power and cogeneration facilities that supply needed sources of electricity to America's public utilities and steam to industrial customers. USGen is experienced in the entire spectrum of services necessary to develop, finance, construct, operate and maintain environmentally sound electric power and cogeneration plants. USGen is a partnership of PG&E Enterprises, Pacific Gas & Electric Company's unregulated subsidiary, and Bechtel Enterprises, a unit of Bechtel Group, Inc.

USGen currently is managing the construction of an 80-MW, $202 million, waste-coal facility in Pennsylvania; two pulverized coal cogeneration plants, one 224-MW $574 million unit and the other a 202 MW $512 million unit , in New Jersey; one 330-MW $825 million pulverized coal cogeneration plant in Florida; and a 96-MW, $139 million natural gas-fueled plant in New York. In addition, USGen acquired a 250 MW $525 million coal-fired circulating fluidized bed cogeneration plant in Florida in April 1993. Another five projects, two of which are natural gas-fueled, are in advanced stages of development. Together they represent 373 MWs of capacity and approximately $485 million of investment. A summary of these projects follows this Exhibit as Exhibit D-1.

Regulatory Citations -- Project Order Addendum 2 Paragraph II.B.1

No regulatory citations have been issued against U.S Generating Company, nor any of the projects under its direct management control. We believe that our record of no citations is a

byproduct of our compliance program, and the experience and talents of the people who implement it. The program includes the following elements: specific policies and procedures, which are tied to the corporate environmental mission statement; training, including an environmental awareness component; automated compliance tracking; and formal and informal audits. In addition, project teams consisting of members from each functional area share responsibility for environmental compliance.

Supervisor for Bechtel Power. In addition, for three years he was an independent consultant to utility and industrial clients. Weidinger has a B.S. in Mechanical Engineering from Montana State University and is a Registered Mechanical Engineer in California and Washington.

QUALIFICATIONS OF KNOWN CONTRACTORS - OAR 345-21-015(1)(d)(C)

Overview

Applicant has entered into a turnkey engineering, procurement and construction contract with Bechtel Power Corporation. Under this arrangement, Bechtel Power Corporation is the prime contractor for the Project. It will, in turn, execute various contracts for goods and services (including contracts for significant Facility components) that it needs to perform its obligations under its contract with Applicant. The combustion turbine for the Project will be supplied by General Electric Corporation. Bechtel Power Corporation's qualifications are discussed above . On or before the date upon which Applicant executes a loan or other agreement to secure construction funding for the Project, it will enter into an operations and maintenance agreement with USOSC. This agreement will obligate USOSC to perform day-to-day operations and maintenance activities at the Facility in accordance with an annual budget and operating plan that Applicant will approve. USOSC's qualifications are discussed above.

At the same time, Applicant will also sign a management services agreement with USGen. Pursuant to this agreement, USGen will perform certain management functions on behalf of Applicant, including construction management, management of operations, and administration of the financing agreements into which Applicant will enter. USGen's qualifications are discussed above.

Bechtel Power Corporation

Since its establishment in 1898, the Bechtel Group has grown into the preeminent worldwide engineer-constructor, providing a comprehensive range of services for the successful realization of projects. These services include economic and technical studies, master planning, engineering design, procurement, construction, licensing, project management and operation.
Bechtel Power Corporation, a member of the Bechtel Group, provides engineering, procurement, construction and operating services for steam and power projects, including

industrial plants and related facilities. It has provided combustion turbine electricity generating expertise to domestic and international utility, industrial and governmental clients for more than forty years. These generating facilities have ranged from small, aircraft-derivative, simple-cycle installations to multiple combined-cycle installations utilizing industrial gas turbines. Bechtel Power Corporation has provided services for more than 400 combustion turbine units with a combined capacity of over 8,000 MWs.

Building on this experience, Bechtel has created modular approaches using standardized design and integrated systems that can be easily combined and expanded. Packaging these proven elements to meet specific project needs has helped bring numerous electric facilities on-line quickly and efficiently, with many completed ahead of schedule and under budget.

Exhibit D-2 lists Bechtel's combustion turbine plant experience.

U.S. Operating Services Company

PG&E and Bechtel Power Corporation have joined forces to create a company equipped to meet the growing demand for power plant operations and maintenance services. This company, U.S. Operating Services Company (USOSC), combines the former PG&E Operating Services Company and Bechtel Power Corporation Fossil Operations Group. USOSC, in association with its parent companies and affiliates, is well qualified to perform the kinds and quality of services necessary to assure reliable and profitable operation and maintenance of power plants. The diverse experience and resources of PG&E and Bechtel have allowed USOSC to fulfill its commitment to operations which supply safe, technologically advanced, and economical electric power plants. USOSC currently provides day-to-day management services for plant operation and maintenance at five operating non-utility power plants, ranging in size from 54 MWs to 664 MWs.

USOSC's current projects are summarized on Exhibit D-3.

PROJECT ORDER, PARAGRAPH 15

Applicant will obtain the services of a registered engineer as required by ORS Chapter 671.

USGen Project Summary

Project	Location	Technology	Steam Host	Utility	Project MW	Cost $MM	USGen Ownership	Partner	Financial Close	Service Date
OPERATING										
Colstrip	Colstrip, MT	Coal, CFB	None	Montana Power	37	$98	96%	Rosebud Energy	7/88	7/90
Panther Creek	Carbon County, PA	Coal, CFB	None	Metropolitan Edison	83	$226	67.50%	Ford Credit	12/31/92	12/92
				Operating Subtotal	120	$324				
CONSTRUCTION										
Indiantown	Indiantown, FL	Pulverized Coal	Caulkins Citrus	Florida Power & Light	330	$738	60%	GE Capital	Q3/92	Q4/95
Keystone	Logan Township, NJ	Pulverized Coal	Monsanto	Atlantic Electric	202	$504	90%	Keystone Shipping	6/92	Q1/95
Cedar Bay	Jacksonville, FL	Coal, CFB	Seminole Kraft	Florida Power & Light	250	$513	Const. Mgr	Marubeni, AES	Q1/93	Q1/94
Chambers Works	Carneys Point, NJ	Pulverized Coal, SCR	Du Pont	Atlantic Electric	224	$563	60%	GE Capital	4/91	Q2/94
East Syracuse	East Syracuse, NY	Gas, CC	Bristol-Myers Squibb	Niagara Mohawk	96	$131	100%	N/A	1/92	Q4/93
MASSPOWER	Springfield, MA	Gas, CC	Monsanto	Boston Edison, et al.	240	$240	17.50%	Makowski, et al.	3/91	Q3/93
Scrubgrass	Venango County, PA	Waste Coal, CFB	None	Penn Electric	80	$200	70%	Dana Corporation	12/90	3/93
				Construction Subtotal	1,422	$2,889				
ADVANCED DEVELOPMENT									Expected Close	Expected On-Line
Northampton	Northampton, PA	Waste Coal, CFB	Ponderosa Fibers	Metropolitan Edison	92	$295	100%		Q4/92	Q2/95
New Bedford	New Bedford, MA	Coal, CFB	Polaroid/ Acushnet	NEP, CommElectric	300	$692	70%	Eastern Energy	Q2/92	Q4/96
Wallkill	Wallkill, NY	Gas, CC	None	Orange & Rockland	95	$125	100%		Q4/93	Q1/96
Taunton	Taunton, MA	Coal, CFB	None	Taunton MLP	153	$359	42.50%	Constellation, Cogen Services	Q2/94	Q1/97
Hermiston	Hermiston, OR	Gas, CC	Lamb-Weston	Portland General Electric	234	$209	100%		Q2/94	Q2/96
				Adv. Dev. Subtotal	874	$1,680				
				PROJECT TOTAL	**2,416**	**$4,893**				

Exhibit D-1a

Bechtel Combustion Turbines and Combined Cycles Engineering and Construction Experience

Plant	Client	Location	Nominal MW	Simple Cycle Combustion Turbine	Combined Type	Fuel	Scope	Completion	HRSG Type	NOx Control	Remarks
Perryman Combined Cycle	Baltimore Gas & Electric Co.	Baltimore	2 x 450	1 (Initial)	I (Final)	Gas/Oil	SE	1994/95	U	WTR/ STM	Phased construction project Dry low NOx combustor and power augmentation
Martin Station Units 3 & 4	Florida Power & Light Co.	Florida	2 x 400		I	Gas/Oil	E	1993/94	U	STM	Phased construction Dry low NOx combustor Steam injection for oil refinery
MASSPOWER Cogen	MASSPOWER	Massachusetts	240		I	Gas/Oil	EPC	1993	U	STM/SCR	
Hay Road Station Units 1, 2, 3, & 4	Delmarva Power & Light	Delaware	460 (Final)	I (Initial 300 MW)	I (Final)	Gas/ Kerosene	E	1989/93	U	WTR	Phased construction project Dry low NOx combustor Water injection for oil firing & power augmentation
March Point Cogen	March Point Cogeneration Co	Washington	140	I (Initial)	I (Final)	Gas/Avjet	EPCSU	1991/92	F	STM/SCR	Phased construction project Multiple fuel types
Selkirk Cogen	Selkirk Cogen Partners	New York	92		I	Gas/Oil	EPCSU	1992	F	STM	Low NOx (quite) combustor
Damietta Combined Cycle	Egyptian Electricity Authority	Egypt	3 x 400 (Final)	I (Initial)	I (Final)	Gas/Oil	EPCM	1989/92	U	WTR/ STM	Phased construction project Dry low NOx combustor
Ocean State Power	Ocean State Power	Rhode Island	2 x 250		I	Gas/Oil	E	1990/91	F	WTR/SCR	Bechtel is Owner's engineer
Chalk Point Units 5 & 6 Combustion Turbine	Potomac Electric Power Co	Washington D.C.	2 x 100	1		Gas/Oil	E	1991	—	WTR	Phased low NOx combustor Water injection for oil firing
Mohave Cogen	Westinghouse Electric Corp	California	55		I	Gas	EPCSU	1990	U	STM/ SCR	CO reduction by catalytic conversion
U.S. Borax	U.S. Borax	California	55		I	Gas	EPC	1990	F	STM	
DeCordova	TU Electric	Texas	4 x 65	I		Gas/Oil	PCM	1989	--	WTR	

LEGEND

SCOPE:

- S - Stud
- E - Engineering
- P - Procurement
- CM - Construction
- CM - Construction Management
- L - Licensing
- SU - Startup
- O - Operation & Maintenance

TURBINE TYPE:

- I - Industrial combustion turbine
- AD - Aircraft-derivative combustion turbine

HRSG TYPE:

- U - Unfired HRSG
- F - Fired HRSG

NOx CONTROL:

- STM - Steam Injection
- WTR - Water Injection
- SCR - Selective catalytic reduction
- STIG - Steam injection for power

Exhibit D-2a

Bechtel Combustion Turbines and Combined Cycles Engineering and Construction Experience

(Continued)

Plant	Client	Location	Nominal MW	Simple Cycle Combustion Turbine	Combined Type	Fuel	Scope	Completion	HRSG Type	NOx Control	Remarks
Permian Basin	TU Electric	Texas	2 x 65	I		Gas/Oil	PCM	1989	--	WTR	
American I Cogen	Basic American Foods	California	120		I	Gas/Oil	ELPC-SUO	1989	U	SCR	
Port Arthur Refinery Cogen Project	Fina Oil Co	Texas	40	I		Gas	EPCM	1988	F	STM	Phased construction Provisions for future conversion to combined cycle
Oak Creek	Wisconsin Electric Power Co	Wisconsin	200	I		Gas/Oil	S	1988	--	WTR	Phased construction concept
Gilroy Foods Combined Cycle	Gilroy Foods, Inc.	California	120		I	Gas/Oil	EPC SUO	1988	U	STM	Quiet combustor and CO reduction by catalytic conversion
Sun's Midway Sunset Cogen	Sun Exploration & Production/Southern Sierra Energy Co.	California	225	I	--	Gas	Prelim EL	1987	F	STM	
Tullnerfeld	GKT	Austria	600		I	Gas/Oil	S	1987	U	--	Nuclear-to-fossil-conversion
Belridge	Shell Oil Company	California	40		AD	Gas	ECM	1986	F	SCR	
Calcogen/Dresser	Metropolitan State Hospital	California	28		AD	Gas	EPC	1986	F	SCR	
Chesterfield	Virginia Power	Virginia	400		I	Gas/Oil Syngas	S	1986	F	STM	Phased construction concept, heavy oil studies
Edge Moor	Delmarva Power & Light	Delaware	200		I	Gas/Oil Syngas	S	1986	U	STM	Phased construction concept
Generic	Atlantic Electric	New Jersey	200	I		Gas/Oil Syngas	S	1986	U	SCR	STIG, phased construction concept
Generic	Atlantic Electric	New Jersey	200		I/AD	Gas/Oil Syngas	S	1986	U	SCR	STIG, phased construction concept

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Bechtel Combustion Turbines and Combined Cycles Engineering and Construction Experience

(Continued)

Plant	Client	Location	Nominal MW	Simple Cycle Combustion Turbine	Combined Type	Fuel	Scope	Completion	HRSG Type	NOx Control	Remarks
Kern County	Frito Lay	California	6		AD	Gas	EPC	1986	F	SCR	STIG
Modular Plant	In-house Study	Generic	200		I/AD	Gas/Oil Syngas	S	1986	F	STM	STIG, phased construction concept
Pentagon	U.S. Army	Virginia	2	I		Oil	E	1986	--	--	
Texas City Refinery Cogen	Amoco Oil Company	Texas	190		I	Gas	EP	1986	F	STM	
Long Beach Cogen	THUMS Long Beach Co	California	50		I	Gas	SL	1986	U	SCR/ STM	CO catalytic converter as well
Bakersfield	Shell Oil Co.	California	40		AD	Gas	EPC	1985	F	SCR	
Cal. Institute of Tech.	Cal. Tech.	California	4		AD	Gas	EC	1985	F	SCR	
Chevron Offshore	Chevron	California	11		AD	Gas	EPC	1985	F	--	
Cool Water East	EPRI	Virginia	215		I	Syngas	S	1985	F	STM	Phased construction concept
Combined Cycle Cogen	Greenleaf Power Corp	California	50		AD	Gas	EPC	1985	F	SCR	
Port Neches	AES/Texas Chemical	Texas	350		I	Gas	S	1985	F	STM	
Shoubrah El-Kheima	Egyptian Electricity Authority	Egypt	33	I		Gas/Oil	EPC	1985	--	--	Designed for conversion to combined cycle
Tula 1 & 2	Com. Federal de Electr.	Mexico	520		I	Gas/Oil	ECM	1985	F	STM	Phased construction
Cool Water	Southern Cal. Edison	California	100		I	Syngas	EPC	1984	F	STM	Grassroots synthetic fuel design; first IGCC in US
Geismar	Applied Energy Services	Louisiana	120		I	Gas/Oil	E	1984	F	STM	
Gold Bond Paper Products	Stockton Paper Mill	California	25-50		AD	Gas	S	1984	F	SCR	

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Bechtel Combustion Turbines and Combined Cycles Engineering and Construction Experience

(Continued)

Plant	Client	Location	Nominal MW	Simple Cycle Combustion Turbine	Combined Type	Fuel	Scope	Completion	HRSG Type	NOx Control	Remarks
Int'l Power Technology	San Jose State University	California	6	AD		Gas	EPCM	1984	--	WTR	
Badak 7	Pertamina	Indonesia	13	AD		Oil	EPC	1983	--	--	
Fawley	Esso	UK	37	AD		Oil	EPC	1983	--	--	
Perryman	Baltimore Gas & Electric	Maryland	600		I	Syngas	S	1983	U	STM	Study of alternative technologies, GCC, CFBC, and FGD
Port Arthur	Texaco	Texas	38		I	Gas/Oil	EPC	1983	F	WTR	
New England Energy Park	EG&G Synfuels	Massachusetts	500		I	Syngas	S	1982	F	STM	
Stony Brook Energy Center	Mass. Municipal Wholesale Electr. Co.	Massachusetts	515 at peak	I (170 MW)	I (345 MW)	Oil/Gas	EPCM	1981	U	STM/WTR	First use of steam for NOx control; designed for conversion to an all combined cycle plant
Bu Hasa 1, 2, 3, & 4	Gasco	Abu Dhabl	100	I		Gas	EPCM	1980	--	--	
Arun 1, 2, 3, 4, & 5	Pertamina	Indonesia	16	AD		Gas	EPC	1978	--	--	
Mildred Lake 1 & 2	Syncrude	Alberta	50	AD		Gas	C	1978	--	--	
Das Island 3 & 4	Abu Dhabl Gas Liquefaction Co	Abu Dhabi	12	AD		Gas	EPCM	1976	--	--	
Dos Bocas 1 & 2	Com Federal de Electric	Mexico	520		I	Gas/Oil	E	1976	F	STM	
Gomez Palacia	Com. Federal de Electric	Mexico	260		I	Oil	E	1976	F	STM	
Morgantown 3, 4, 5, & 6	Potomac Electric Power	Maryland	216	I		Oil	EC	1973	--	--	
Morgantown 1 & 2	Potomac Electric Power	Maryland	40	I		Oil	EC	1970/71	--	--	

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Bechtel Combustion Turbines and Combined Cycles Engineering and Construction Experience

(Continued)

Plant	Client	Location	Nominal MW	Simple Cycle Combustion Turbine	Combined Type	Fuel	Scope	Completion	HRSG Type	NOx Control	Remarks
Mandalay 3	Southern Cal. Edison	California	132	I		Gas/Oil	EPC	1970	--	WTR	
Alamitos 7	Southern Cal. Edison	California	132	I		Gas/Avjet	EPC	1969	--	WTR	
Missouri Ave 1,2,&3	Atlantic City Electric	New Jersey	60	I		Kerosene	EPCM	1969	--	--	
White Pine 4	White Pine Copper	Michigan	27		I	Oil	EPC	1969	--	--	
Huntington Beach 5	Southern Cal. Edison	California	140	I		Gas/Avjet	EPC	1969	--	WTR	
Etiwanda 5	Southern Cal. Edison	California	132	I		Gas/Avjet	EPC	1969	--	WTR	
Buzzard Point	Potomac Electric Power Co.	Washington, D.C.	260	I		Oil	EP	1968	--	--	
Stony Brook 1	Mass. Municipal Wholesale Electr. Co.	Massachusetts	341		I	Gas/Oil	EPCM	1968	U	STM	First use of steam for NOx
USS Portable Power	Army Corps of Engineers	Dockside	20	I		Oil	EP	1968	--	--	Barge-mounted plant
Freeport A&B	Dow Chemical	Texas	186		I	Oil	EPC	1967	F	WTR	Supercharged and evaporator coolers
Continental Paper	Continental Can	Georgia	100		AD	Gas	EPC	1966	F	--	Black liquor, fully-fired boiler (FD fan)
Pittsburgh	Dow	California	60		I	Gas/Oil	EPC	1966	F	--	
San Angelo 1	West Texas Utilities	Texas	100		I	Oil	EP	1966	F	WTR	First supercharge combined cycle plant in USA

LEGEND

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NOx CONTR

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- SCR - Selective catalytic reduction
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USOSC Project Summary

Status	Project	Location	Size (MWs)	Fuel	On-Line	Steam Host
Operation	Doswell	Ashland, VA	660	Gas, CC	1992	None
	Gilroy	Gilroy, CA	120	Gas, CC	1988	Gilroy
	American 1	King City, CA	120	Gas, CC	1989	Basic American
	Gilberton	Frackville, PA	80	Waste Coal	1988	Gilberton Sales
	SEMASS	Rochester, MA	54	Waste-to-Energy	1988	None
Construction	Chambers	Carneys Point, NJ	224	Coal	1994	E.I. du Pont
	East Syracuse	East Syracuse, NY	96	Gas, CC	1994	Bristol-Myers
	Scrubgrass	Scrubgrass TWP., PA	80	Waste Coal	1993	Squibb
	Keystone	Logan Twp., NJ	202	Coal	1995	Monsanto
	Cedar Bay	Jacksonville, FL	250	Coal	1994	Seminole Kraft
	Indiantown	Indiantown, FL	330	Coal	1995	Caulkins Citrus
Advanced Development	Wallkill	Wallkill, NY	150	Gas, CC	1996	None
	Northampton	Allentown, PA	92	Waste Coal	1994	Ponderosa Fibers
	New Bedford	New Bedford, MA	300	Coal	1996	Polaroid/Acushnet
	Hermiston	Hermiston, OR	230	Gas, CC	1997	Lamb-Weston

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F

EXHIBIT F

MATERIALS ANALYSIS - OAR 345-21-05(1)(f)

INTRODUCTION

This Exhibit identifies the inventory of industrial materials which will flow into and out of the Project in substantial quantities during construction and operation and, where applicable, describes how these materials will be stored and disposed of. It is relevant to the findings that the EFSC must make under OAR 345-22-120.

FUEL

The Project will be fueled with natural gas from the Canadian province of Alberta obtained under long term contracts either by shippers holding firm capacity rights in the expansion certified by the Federal Energy Regulatory Commission of the PGT system, or by Alberta producers in conjunction with incremental expansion of the PGT system. Applicant has obtained firm letters of intent from shippers holding expansion capacity on PGT, firm Alberta producers and aggregators, and PGT to provide expansion capacity. A gas pipeline less than five miles long will be constructed to bring natural gas from the PGT pipeline to the Project. Proposed routings are shown in Figure C-4 of Exhibit C.

The Project will require approximately 90 MMcf/d of natural gas fuel during normal operations. The fuel will be consumed on site.

SOLID WASTE MATERIALS

Construction of the proposed facility is expected to generate waste steel, other waste metals, and normal miscellaneous construction debris (consisting of wood, concrete, paper, and other refuse). Debris will be stored in on-site dumpsters, with periodic hauling via a private contractor, to a properly licensed facility. Construction material and office recycling programs will be implemented to the greatest extent practical to reduce waste. Sewage generated during construction will be stored in tanks, and periodically removed from the site by a sewage disposal vendor. Flushing oils and other wastes will be stored in barrels or tanks prior to disposal by an appropriate vendor licensed for waste disposal.

Approximately 10 tons per month (per combined cycle unit) of filter cake will be generated if the process water sidestream softener is utilized for the project (see Exhibit B). This filter cake will be stored on site in bins and periodically removed for off-site disposal at local landfills. Two local landfills are available to accept the filter cake; the Finley Buttes landfill and the Columbia Ridge landfill. Both facilities are relatively new, large capacity landfills. The Columbia Ridge landfill has in excess of 50 years of capacity (Coenen 1993). A copy of the Columbia Ridge Landfill Special Waste Management Plan is attached as Exhibit F-1.

Approximately 40 tons per year of normal domestic waste will be generated by the Project, which will be disposed of by a private contractor. Recycling programs will be instituted to further minimize waste. Standard maintenance activities at the facility will generate small quantities of solid waste on a periodic basis.

Waste oils and potentially hazardous wastes generated by the facility will be disposed of by an appropriate permitted waste vendor.

WATER USE AND SUPPLY

Introduction

The total daily water demand for the Project is projected to be approximately 2,600 gpm. As described in Exhibit B, the major consumption of water for the facility will be through the

evaporative losses from each of the two cooling towers and from the inlet air cooling system. Water will also be required for makeup in other systems, for general maintenance activities, and for domestic purposes.

Approximately 515 gpm of process effluent is expected to be generated by the facility, consisting primarily of cooling tower blowdown. Boiler water pre treatment effluent will be reused within the plant. Regeneration of ion exchange resins will be performed off site. Cooling tower blowdown would either be discharged via surface application, as described in Exhibit B and Exhibit M; or, if the sidestream softener is used to treat the process water, the process effluent will be eliminated.

Water Balance

Water balance diagrams for the proposed facility are shown in Figures F-1a (land application approach) and F-1b (sidestream softener approach). The water and effluent flowrates listed depict facility requirements based on an ambient air temperature of 95°F assuming that the cooling towers are operated at five to twenty cycles of concentration (depending on whether land disposal or sidestream softening is used to manage process water), and with evaporative inlet-air cooling. Columbia River water will be the supply source.

The total daily water demand for the facility under these conditions is projected to be approximately 2,600 gpm. To minimize the total water requirements for the Project, internal recycle/reuse has been designed into the energy facility. As shown in the water balance (Figure F-1), reverse-osmosis effluent and boiler blowdown will be reused within the plant. The total water savings through reuse will be approximately 50 gpm compared to what the water demand would be without these conservation measures.

Effluent Characteristics and Disposal (no sidestream softener)

Approximately 515 gpm of process effluent is expected to be generated by the facility. Process effluent from the generating plant will originate from three primary sources:

- sanitary wastes
- miscellaneous plant maintenance wastes

- cooling tower blowdown

Reverse-osmosis system reject water and boiler blowdown will be reused within the Project. Sanitary wastes will be diverted to the existing domestic wastewater treatment system at the Lamb-Weston plant.

As shown in Figure F-1, plant maintenance wastes generated during steam turbine area washes, HRSG area washes, and cooling tower area washes will be collected via floor drains, treated for oil and grease removal, and directed to a wastewater equalization tank.

Treated discharge from the equalization tank, along with cooling water flows described further below, will be reused for crop irrigation. The plan for reuse of this water is described in *Cooling Water Reuse Land Application System Management Plan,* CH2M HILL, Portland, Oregon, December, 1992, a copy of which is provided in Exhibit M.

Cooling Tower Blowdown Characteristics

A conventional wet evaporative cooling tower system will be used to dissipate process heat and condense steam back into water in the steam turbine condensers. The cooling system will operate on a continuous basis using a mechanical draft cooling tower for each steam turbine condenser. Cooling water in the cooling system will be recirculated continuously. However, unless a sidestream softener is used to treat the process water, some blowdown is required to prevent excessive buildup of dissolved solids, which would otherwise result in scale formation in the condenser and/or increased corrosion rates for system components. Dissolved solids result from the concentration of native dissolved salts and minerals due to evaporative loss from the system.

Based on available data and information, typical cooling tower chemical additives will include the following:

- sodium hypo chlorite as a disinfectant and biocide
- tolytriazole and a non-hazardous acrylic co-polymer for corrosion control
- sulfuric acid for corrosion control and to neutralize pH
- sodium bisulfite to dechlorinate cooling tower blowdown (if required)

The blowdown volume will vary depending on the number of cycles of concentration utilized. Available data and information suggest that expected feedwater characteristics will allow the system to operate at five or more cycles of concentration. The corresponding cooling tower blowdown volume is expected to be approximately 500 gpm at five cycles of concentration.

Constituents in the cooling water effluent will be primarily higher concentrations of native impurities. Concentrations of other additives should be below detectable levels.

Preliminary analysis indicates that phosphate-based additives will not be required to limit scale and corrosion in the cooling tower. Influent phosphate levels of 0.04 - 0.08 mg/L will be concentrated approximately five times resulting in a combined total discharge through the cooling tower blowdown of about 2 lb/day.

Phosphates will be used in limited amounts for corrosion control in the HRSG and will be present in the blowdown proposed to be reused as part of cooling tower make up water. This amount of phosphate, when diluted in the 500,000–600,000 gallon water volume in the cooling tower basin, is not expected to add significantly to the background concentration.

The discharge of free available chlorine from the energy facility will be closely monitored. A low level of free available chlorine will be maintained in the cooling system at all times to protect against biofouling. Prior to discharge, excess chlorine (if any) will be removed from cooling tower blowdown through the addition of sodium bisulfite. Average daily free chlorine concentrations in the discharge will be limited to 0.5 mg/L.

SCR SYSTEM

The SCR system utilizes aqueous ammonia as a reagent for control of NO_X emissions. The ammonia will be stored on-site in a 20,000 gallon tank. Secondary containment for the ammonia will be provided by means of a diked concrete area around the storage tank. The diked area will have the capacity to contain 125 percent of the volume of the ammonia tank.

The SCR system utilizes a catalyst which requires periodic replacement. The spent catalyst will be removed for off-site recovery and/or disposal by the supplier.

OTHER CHEMICALS

Approximately two to five thousand gallons of sulfuric acid, used for pH control, will be stored in two tanks on site. The tanks will be supported on saddles and surrounded by a secondary containment dike. A normally closed drain valve will be provided at the bottom on the dike. The area enclosed by the dike will be partially filed with coarse limestone to passively neutralize any potential leakage from the tank.

FDA approved chemicals will be used for boiler feedwater treatment and include erythorbate for oxygen scavenging, inorganic phosphates, synthetic polymers and alkaline amines for corrosion protection. These will be delivered and stored in four hundred gallon totes. The totes provide considerable protection because they include leak proof plastic liners, permitting these materials to be stored in normal warehouse spaces. In the unlikely event of leakage, the barrel would be quickly used or processed through the neutralization tank, described below.

Oxygen scavengers for boiler water treatment will be transported and used directly from shipping containers that are designed to be leak proof and highly resistant to damage. Injection pumps will take suction directly from these containers, so that personnel are not exposed to the solution.

Sodium hypo chlorite for chlorination is required in the pretreatment system. Purchased sodium hypo chlorite solution will be stored in a tank and pumped via metering pumps.

The process water sidestream softener will require the use of calcium hydroxide, ferric sulfate, soda ash, and sulfuric acid. These chemicals will be stored in tanks and pumped via metered pumps.

Curbs and drains will be installed at all chemical treatment areas that will route spills along underground gravity feed lines to a chemical sump. Any spilled chemicals would then be pumped to a neutralization tank for containment and treatment prior to disposal. All transport piping will

be constructed of compatible material to prevent corrosion or deterioration by the liquid being carried.

OTHER MATERIALS

A number of miscellaneous chemicals and equipment lubricants, in addition to spare parts and equipment, will be stored within either the warehouse or other Project buildings.

Compressed gases used at the energy facility, such as carbon dioxide (CO_2) and nitrogen, will be stored outdoors in returnable cylinders. Hydrogen will be stored outdoors in high pressure storage cylinders mounted above ground and enclosed with a safety fence.

SUMMER OPERATION with 70,000 lb/hr to process

Note Water consumption for evaporative cooling of combustion turbine inlet air

WATER REQUIREMENTS (GPM) Flow rates shown are for one unit. Total flowrates for the facility would be twice the values shown here.

Deliver to Process	Process Return	Cooling Twr Evaporation	Cooling Twr Blowdown	HRSG Blowdown	Steam for NOx Control	Water for Evap Clng.	RO Reject	Demin Reject	Reuse	Total
140.06	70.03	950.00	237.50	8.60	Dry	39.48	32.43	0.00	246.50	1297.01

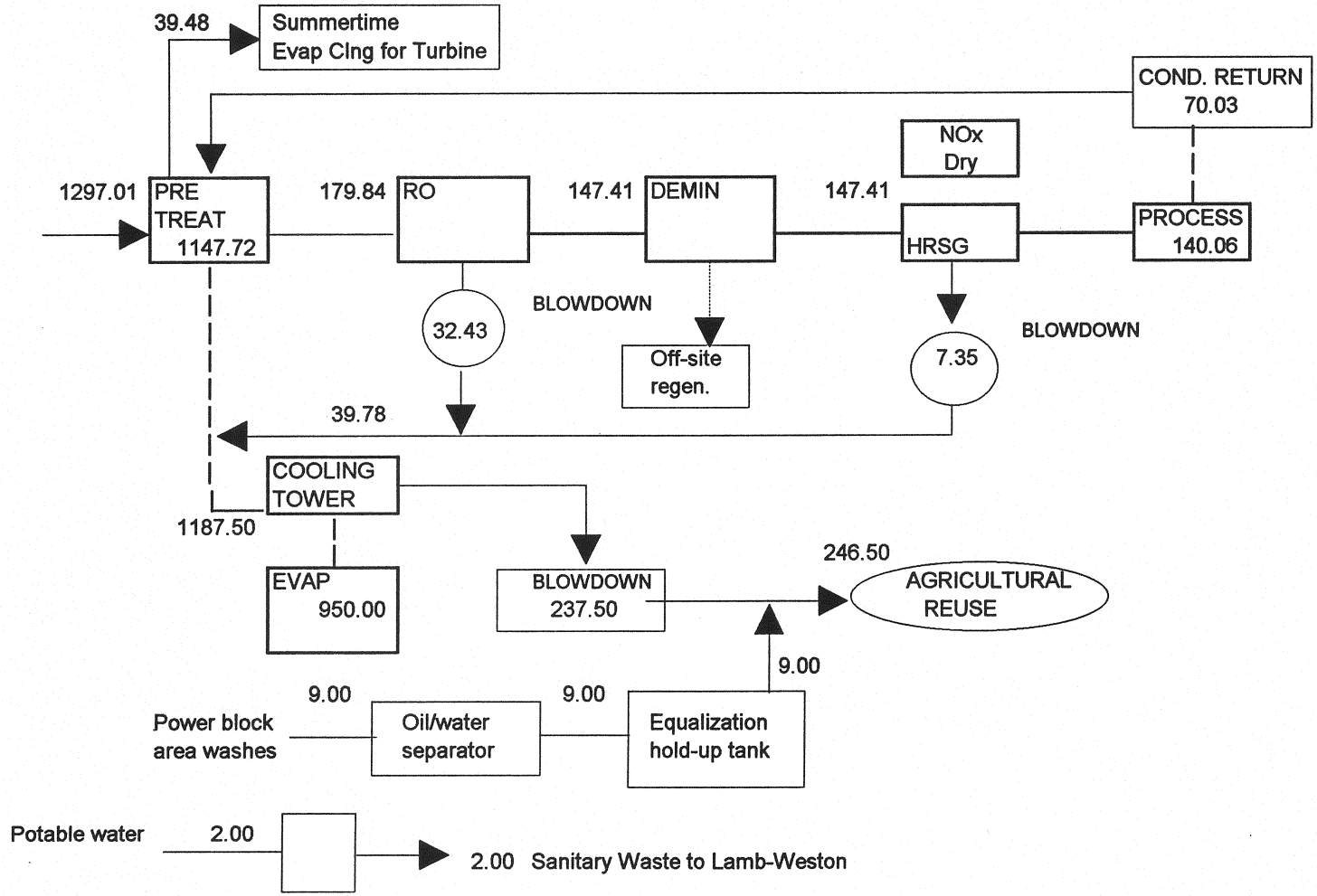

Figure F-1a: Water Balance without Sidestream Softener

HERMISTON WATER BALANCE: NORMAL OPERATION with 70,000 lb/hr to process

(VALUES ARE FOR A SINGLE UNIT at AVERAGE TEMPERTURE CONDITIONS - 50 Deg)

WATER REQUIREMENTS (GPM)

Deliver to Process	Process Return	Cooling Twr Evaporation	Cooling Twr blowdown	HRSG Blowdown	Steam for NOx Control	RO Reject	Demin Reject	Reuse	Total
140.06	70.03	820.00	0.00	7.35	Dry	32.43	0.00	0.00	941.03

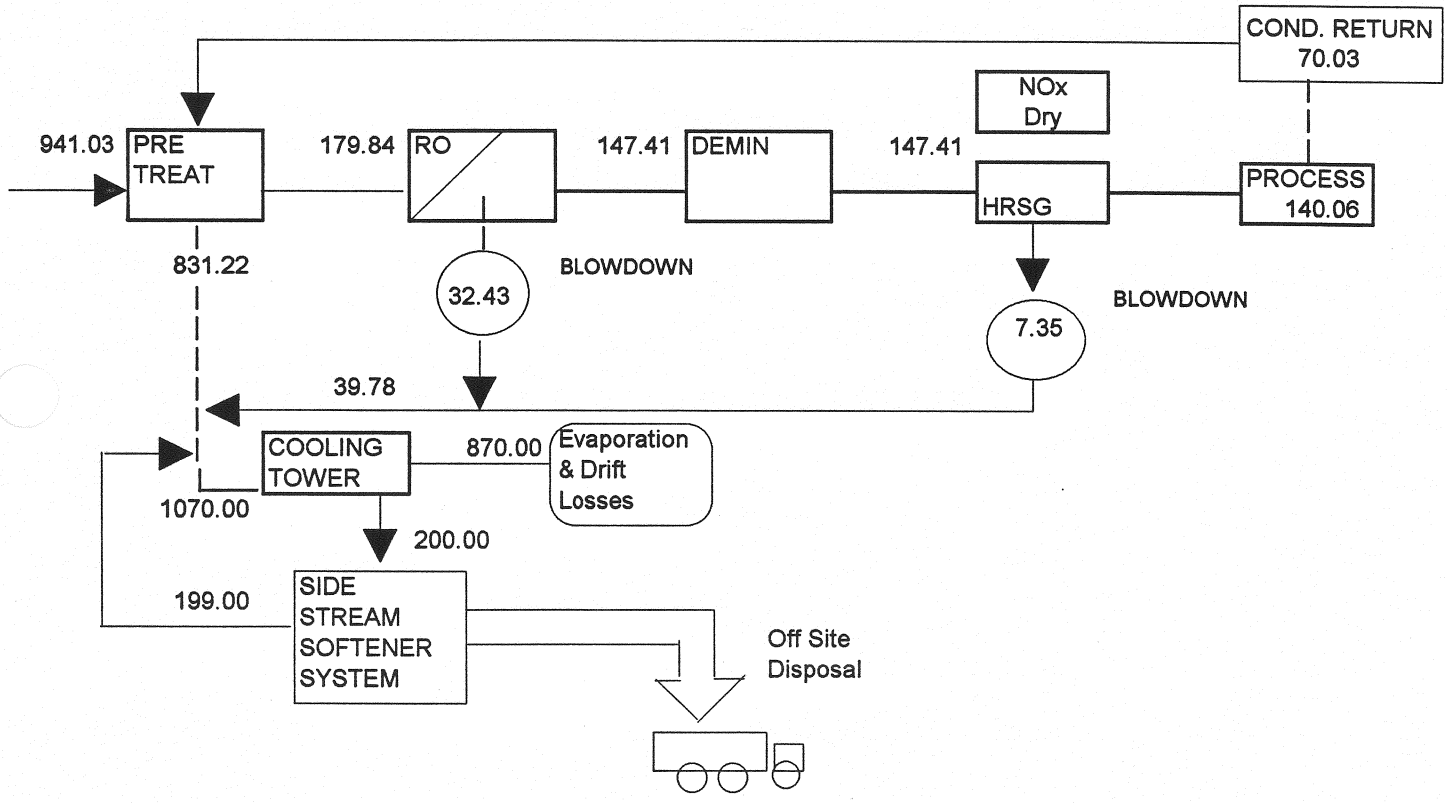

Figure F-1b: Water Balance with Sidestream Softener

EXHIBIT F-1

COLUMBIA RIDGE LANDFILL
SPECIAL WASTE MANAGEMENT PLAN

SPECIAL WASTE MANAGEMENT PLAN

COLUMBIA RIDGE LANDFILL AND RECYCLING CENTER
GILLIAM COUNTY, OREGON

For submittal to:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

BY

WASTE MANAGEMENT OF NORTH AMERICA
MOUNTAIN REGION
4020 LAKE WASHINGTON BLVD. SUITE 310
KIRKLAND, WA 98033

October, 1991

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INTRODUCTION

This Special Waste Management Plan (Plan) describes how wastes other than municipal solid waste will be managed at Columbia Ridge Landfill and Recycling Center (Columbia Ridge), an operating division of Waste Management of North America (WMNA). This plan, together with the design plans for the landfill, also satisfies the requirements of the "Waste Management Plan" required by OAR 340-61-060.

There are two types of waste discussed in this plan: (1) hazardous and unacceptable waste, and (2) special waste, which is acceptable for disposal but which may require special characterization and handling. Hazardous and unacceptable wastes are discussed in Part I while Part II describes WMNA's Policy for non-hazardous special waste. Part III specifies the analyses used to characterize special wastes when such testing is required. Part IV describes general and specific management practices for special wastes.

This Plan incorporates the conditions of the Oregon Department of Environmental Quality's July 11, 1991 letter that approved the previous version of the Plan dated April, 1990.

Regulatory compliance regarding special waste management at the site will be considered based on applicable permit conditions and regulations, many of which are cited or integrated herein. These particular provisions should not be modified without the specific written approval of ODEQ. Design and operating provisions, contained in this Plan that are not specifically required by permit or regulations may be modified with the approval of Waste Management of North America's Environmental Management Department (EMD), and will not constitute governmental compliance requirements.

If any procedure or stipulation in this Plan is inconsistent with the requirements of or revisions to Permit #391 (as revised in June, 1991) or applicable Oregon regulations, permit and regulatory requirements will take precedence.

I. HAZARDOUS AND UNACCEPTABLE WASTES

A. Hazardous Waste

This site is prohibited from accepting hazardous waste as defined by Oregon law (ORS 466.005), except as provided in Oregon's Department of Environmental Quality (ODEQ) administrative rules. This site will not accept regulated amounts of hazardous waste as defined by federal or state hazardous waste regulations. Out-of-state waste defined as hazardous by the state of origin but not classified as such in Oregon (for example, some Washington dangerous waste) will not be disposed at Columbia Ridge.

B. Other Unacceptable Waste

Pursuant to Permit #391, other wastes not permitted at this site are as follows:

1. waste containing free liquids in excess of 25 gallons per load
2. nondigested sewage sludge
3. septic tank pumpings

In addition to the restrictions described above, the following regulated materials will not be knowingly accepted:

1. Waste regulated as radioactive by the Nuclear Regulatory Agency.
2. Wastes containing greater than 1 ppm PCB.
3. The following wastes as identified by Senate Bill 66 (SB 66), effective July 1, 1991:
   a. "Discarded or abandoned vehicles".
   b. "Discarded large home or industrial appliances".
   c. "Used oil"
   d. "Tires"
   e. "Lead-acid batteries".

As of this writing, there is no State guidance regarding implementation of this statute, specifically guidance regarding any unregulated quantity of the five waste types listed under item 3 pursuant to SB 66.

C. Unacceptable Waste Detection

WMNA's special and hazardous waste identification procedures required at Columbia Ridge are also required of intermodiate waste transporters located at the Portland Metro South Transfer Station and the Kennewick Transfer Station, which are both operated by WMNA. These procedures require load checking and training to identify hazardous and unacceptable waste. Load checking is performed by the gate crew and heavy equipment operators during the waste acceptance and handling process. Gatehouse personnel and equipment operators have been instructed to watch for potentially hazardous and unacceptable wastes. They receive periodic training updates on waste identification procedures. Equipment operators also receive training on procedures to follow to safely segregate potentially hazardous and unacceptable wastes.

All wastes which appear to be hazardous or unacceptable will be turned away at the gate. If deposited at the transfer station or the landfill before discovery, the waste will be isolated or removed from the active area immediately. The generator, if identified, will be held responsible for managing the waste

properly. WMNA will provide technical assistance to help determine and implement the proper management method.

Condition A.7 of ODEQ Permit #391, as revised in June, 1991, includes the following requirements related to the management of unacceptable wastes:

> "Any solid wastes delivered for disposal which appear to be unacceptable waste shall immediately be isolated or removed from the active filling area and action commenced to identify the waste. If the waste is determined to be non-hazardous unacceptable waste, the waste shall be transported off-site within 90 days of that determination to an authorized facility or to the generator, unless otherwise approved by the Department. If the unacceptable waste is determined to be hazardous waste, the Department shall be notified and action initiated to arrange for proper treatment, storage or disposal within 72 hours of that determination. The waste, if hazardous, shall be removed from the site within 90 days of that determination, unless otherwise approved by the Department. All unacceptable waste storage, transportation, treatment and/or disposal by the permittee will be performed in accordance with all applicable federal, state and local laws."

As disposal of municipal solid waste streams from additional transfer stations are added to the Columbia Ridge Landfill, OWS will confirm to ODEQ that inspection procedures will be extended to the new loading locations or otherwise implemented.

The telephone notification list for the site is found in Appendix A.

II. COMPANY POLICY ON SPECIAL WASTE MANAGEMENT

A. Introduction

Special wastes defined by WMNA must be specifically approved through the Company Special Waste program prior to acceptance at the landfill. The program is designed to assist environmental and operational personnel to determine the acceptance and handling procedures suitable for each special waste. Generators must provide written documentation on their waste sufficient to make this decision.

The special waste program requires the generator to characterize the special waste and to certify this characterization. If chemical analysis is required, this work must be performed by a laboratory acceptable to WMNA on a sample certified as representative by the generator. The program allows for WMNA to acquire a representative sample from the generator, if necessary, for analysis directed by WMNA that is deemed necessary to independently verify the generator's waste characterization.

WMNA has divided special waste into two categories, Type A and Type B.

B. Type A Special Waste

"Type A Special Waste" means any waste, from a commercial or industrial activity meeting any of the following descriptions (note that some of these special waste types are unacceptable wastes pursuant to Permit #391):

1. Containerized waste (e.g., a drum, portable tank, lugger box, roll-off box, pail, bulk tanker, etc.) listed in paragraphs 2-8 of this subsection B.

2. Waste containing free liquids.

3. Sludge waste.

4. Waste from an industrial process.

5. Waste from a pollution control process.

6. Residue from a spill of a chemical substance or commercial product or a waste listed in paragraph 1-5 or 7 or 8 of this subsection B.

7. Contaminated residuals from the cleanup of a facility generating, storing, treating, recycling, or disposing wastes, chemical substances or commercial products listed in paragraph 1-6 or 8 of this subsection B.

8. Any waste which is non-hazardous as a result of treatment pursuant to the RCRA Subtitle C (or authorized State) hazardous waste program.

C. Type B Special Waste

"Type B Special Waste" means any waste from a commercial or industrial activity meeting the descriptions which follow:

1. Friable asbestos waste from building demolition or cleaning; wall board, wall spray coverings, pipe insulation, etc.

2. Commercial products or chemicals which are off-specification, outdated, unused or banned. Out-dated or off-specification, uncontaminated food or beverage products in original consumer containers are not included in this category, however, containers which once held commercial products or chemicals are included unless the container is empty.

3. Untreated bio-medical waste - Any waste capable of inducing infection due to contamination with infectious agents from a bio-medical source including but not limited to a hospital, medical clinic, nursing home, medical practitioner, mortuary, taxidermist, veterinarian, veterinary hospital, animal testing laboratory or university medical laboratory.

4. Treated bio-medical waste - Any wastes from a bio-medical source including but not limited to a hospital, medical clinic, nursing home, medical practitioner, mortuary, taxidermist, veterinarian, veterinary hospital, animal testing laboratory, or university medical laboratory which has been autoclaved or otherwise heat treated or sterilized so that it is no longer capable of inducing infection.

5. Liquids and sludges from septic tanks, food service grease traps, or washwater and wastewaters from commercial laundries, laundromats and car washes unless these wastes are managed at commercial or public treatment works.

6. Chemical-containing equipment removed from service. Examples: filters, cathode ray tubes, lab equipment, acetylene tanks, fluorescent light tubes, etc.

7. Waste produced from the demolition or dismantling of industrial process equipment or facilities contaminated with chemicals from the industrial process. Chemicals or wastes removed or drained from such equipment or facility are "Type A Special Wastes."

D. Generator Information

Generators provide the following information for each type of special waste being considered for management:

1. Profile sheet describing and certifying waste characteristics (Appendix B).

2. If required by the Technical Manager, laboratory analysis to support and documents the profile sheet.

3. If required by the Technical Manager, a representative sample and certification that the sample represents the waste (Appendix C).

4. Additional information requested by the Technical Manager to support the profile sheet characterization.

5. A Contract/Contractors Definition (Appendix D)

E. WMNA Staff Provides the Following

1. Determines if, based on the information provided, the material is acceptable based on federal, State and local laws, regulations, and permits.

2. Determines if Company policy will allow the waste (e.g. WMNA policy forbids the disposal of certain liquid and sludge wastes).

3. Determines that proper handling requirements, necessary training, engineering controls, etc. are in place or available at the site.

4. Discusses acceptance and handling with appropriate regulatory authorities, when needed.

5. Issues written decision (Appendix E), including any special conditions or handling requirements.

Until these procedures (or an equivalent process) have been completed for any special waste, the waste will not be accepted. If the decisions forbids the disposal of the special waste, the customer will be promptly notified and the identified waste will not be accepted. If the decision carries any conditions, these conditions will be met prior to or as part of the disposal of the identified special waste. Small amounts of special waste may be accepted if determined incidental by WMNA Management or Environmental personnel. These wastes (except for friable asbestos and untreated bio-medical wastes) may be considered "incidental to the load" if the amounts in question do not materially change the physical or chemical identity of the load or make it a hazardous or unacceptable waste.

Documentation obtained during this waste characterization process will be retained indefinitely. ODEQ and WMNA must give approval before these documents may be destroyed.

III. WASTE ANALYSIS

Wastes identified as hazardous by Oregon Administrative Rules (OAR 340-101) are not accepted at this site. Wastes categorized as "Type A" special waste by WMNA require analysis by the generator to provide evidence and certification that they are not hazardous wastes. Analysis requirements are established on a case-by-case by the Technical Manager.

Depending on the process generating the waste and the materials used to generate it, Type A wastes may be analyzed for a wide range of hazardous characteristics and constituents. Wastes for which little information is provided or available will require extensive analysis.

A. Hazardous Waste Characteristics

Depending on the likelihood that a given waste may possess one of the following characteristics, Type A wastes will be analyzed for:

1. Ignitability
2. Corrosivity
3. Reactivity
4. Toxicity

The site will require the results from the Toxicity Characteristic Leaching Procedure (TCLP) or equivalent documentation as per 40 CFR 262.11, Hazardous Waste Determination, for all Type A special wastes and applicable Type B wastes.

B. Listed Wastes

Wastes from the non-specific sources listed in 40 CFR 261.31, hazardous waste from specific sources listed in 40 CFR 261.32, and discarded off-specification products, container residue, and spill residues listed in 40 CFR 261.33 will not be accepted. Wastes from outside Oregon defined as hazardous by the state of origin will also not be accepted.

C. Wastes for which Analysis is not Required

Provided that the generator can adequately describe and certify the waste, the following types of wastes generally do not require chemical analysis for proper characterization as hazardous/nonhazardous.

Wastes not generally requiring analyses:

1. Asbestos
2. Infectious waste
3. Empty containers
4. Chemical containing equipment removed from service
5. Off-specification, outdated, unused or banned commercial products or chemicals
6. Waste produced from the demolition or dismantling of industrial process equipment or facilities contaminated with chemicals from the industrial process

Additional information may be required; see Section IV.

D. Criteria for Evaluating Analytical Lab Data

1. The analytical report must clearly identify whose waste was analyzed and when analyses were conducted; must be signed by the laboratory manager completing the analysis; and must include the laboratory manager's certification that the analyses were completed by the laboratory (not sent to other labs for analysis).
2. Analyses must have been conducted within 12 months prior to the date on the Generator's Waste Material Profile Sheet and within 90 days of the sampling date.

3. The customer must provide a Certification of Representative Sample or equivalent certification that analyses were conducted on a representative sample of the special waste.

4. Analyses may be performed by any of the following:

   a. A commercial or private laboratory certified by a state agency to analyze waste materials, or

   b. A laboratory evaluated by the WMNA Technical Manager and deemed acceptable because of the laboratory's Quality Assurance/Quality Control program, general reputation, record of performance in analyzing waste materials for other clients, or results of any internal or external check samples analyzed by the laboratory.

5. Sample collection, preparation and analytical protocols and methods approved by USEPA, ASTM, Association of Official Analytical Chemists, individual states, or the CWM Vice President of Science and Technology are acceptable.

IV. SPECIAL WASTE MANAGEMENT PRACTICES

A. General

The majority of special wastes will be co-disposed with other solid waste. The site has been designed so that co-disposal at the working face is a safe option for most special wastes. In addition to liner and leachate collection systems, the site protects workers at the face by providing enclosed cabs with dust-filtering systems in all heavy equipment. Spotters and other staff will be provided dust protection and will be required to wear this equipment under certain circumstances, such as those described below. Other safety equipment, including hard hats, gloves, and safety boots, is required at the working face.

All the special waste management methods mentioned below assume the material is not a regulated RCRA or state hazardous waste, and a formal WMNA decision has been completed and approved for that waste. Materials originating in another state must also be non-hazardous in the state of origin.

In general, no special waste will be deposited within ten feet of any liner system.

If approved through the special waste program, specific types of special wastes will be managed as follows:

B. Friable Asbestos

ODEQ Permit #391 (as revised in June, 1991), Condition A.9, states the following:

"Asbestos may be received and disposed in accordance with OAR 340-25-465(13). Friable asbestos-containing waste shall be disposed at one or more clearly marked documented location(s) in accordance with the approved site Operations Manual. Documentation shall include the quantity of asbestos, and accurate dimensions of the storage location(s). The permittee shall not accept friable asbestos-containing waste unless it is wetted and contained in leak-tight containers such as double plastic bags with a minimum thickness of 6 mil each, or fiber or metal drums that are labeled properly. The permittee shall provide a disposal receipt to the transporters of friable asbestos-containing waste, which shows the date and amount of asbestos received."

Condition C.9 of the same Permit #391 states the following:

"Off-loading and disposal of friable asbestos-containing waste shall be accomplished in a manner that prevents leak-tight transfer containers from rupturing and prevents visible emissions to the air.

The permittee shall supervise off-loading of friable asbestos-containing waste. Off-loading shall occur at the immediate location where the asbestos is to be buried and in an area of minimal work activity. Future excavation of this area(s) is not permitted without specific written approval by the Department.

The permittee shall cover friable asbestos-containing waste with at least two feet of soil or one foot of soil and one foot of other waste, or other equivalent cover approved in writing by the Department, before compacting equipment runs over it, but not later than the end of the same operating day that the waste was received."

Friable asbestos will be managed as required by National Emission Standards for Hazardous Air Pollutants (NESHAP) and OAR 340-25-450 through 465. Waste will not be accepted unless wetted with a suitable nonhazardous wetting agent and double-bagged with sealed OSHA or EPA labeled 6 mil plastic bags, or equivalent. Large objects containing friable asbestos must be wetted and double-wrapped and sealed in 6 mil viscuene (or equivalent) to which the appropriate OSHA-required label has been attached. Vehicles must carry a waste shipment record and be properly DOT-placarded. Twenty-four hour shipping notice will be requested before asbestos is to be delivered, so the appropriate disposal area can be prepared.

Asbestos will be placed in the landfill in an area separated from the working face. It must be placed in a manner that will not break open the packaging and allow airborne fibers to escape. Asbestos will be covered with two feet of soil or two feet of refuse plus one foot of soil, at the end of the working day. The location of the asbestos disposal area will be recorded on a 3-D grid basis for future reference. Ideally, asbestos should be placed in vertical columns within a limited number of horizontal locations.

All workers managing asbestos will be trained in asbestos hazards and spill response, and will be fitted for and trained in the use of an OSHA-approved

half-face respirator fitted with HEPA filters. They will be required to wear these respirators whenever they are working in the asbestos disposal area or are examining asbestos loads. Asbestos handling staff will receive a refresher training course at least annually.

No friable asbestos will be accepted at the landfill if the packaging appears to be broken or asbestos is exposed in any way. In cases where the friability of the material under consideration is in question, the ODEQ Air Quality Unit will be consulted.

EXCEPTIONS: Some friable asbestos waste may be accepted in an alternatively packaged form if proper engineering controls, as proposed to and approved by the ODEQ Air Quality Section, are met. In no case would the appropriate OSHA occupational exposure limits be exceeded, or would measurable asbestos fibers be allowed to leave the area.

See Appendix F for additional requirements for asbestos handling.

C. Petroleum Contaminated Soils

Petroleum Contaminated Soils may be accepted provided they do not exhibit any hazardous characteristics as per OAR 340-101. The following analyses are generally considered depending on the specified contaminant.

1. Gasoline Contaminated Soil

   a. Flash point
   b. Toxicity Characteristic Leaching Procedure (TCLP) Test (for appropriate parameters)
   c. Benzene, ethylbenzene, toluene and xylene (BTEX)
   d. Total Petroleum Hydrocarbons (TPH)
   e. PCB Screen
   f. Paint Filter Test

2. Diesel Contaminated Soil

   a. Flash point
   b. Toxicity Characteristic Leaching Procedure (TCLP) Test (for appropriate parameters)
   c. Total Petroleum Hydrocarbon (TPH)
   d. PCB screen
   e. Paint Filter Test

3. Waste Oil/Oil Contaminated Soil

   a. Flash point
   b. Toxicity Characteristic Leaching Procedure (TCLP) Test (for appropriate parameters)
   c. Total Petroleum Hydrocarbons (TPH)
   d. PCB screen
   e. Paint Filter Test

Petroleum contaminated soil which is suitable in quality to be used for daily cover may be used as such. Normally, such soils will only be used for daily cover and not for interim cover or other soil cover layers having specified permeability requirements. Petroleum contaminated soils used as cover will be placed in such manner as to prevent contamination of surface water draining off covered areas. Soils that are unsuitable for use as cover (too rocky, consist of chunks of concrete, etc.) will be managed with other solid wastes in the active disposal area.

D. Industrial Process Waste

Industrial process waste must be analyzed for all hazardous characteristics appropriate to make an adequate determination of its nonhazardous nature. This may depend on the process generating the waste, expected constituents, state of origin, etc.

"Dry" Industrial Process Waste: Unless requested by the generator, this material will be co-disposed. Depending on the type of waste and handling characteristics, it will either be spread thinly over the existing waste and covered as soon as possible with other waste or cover material, or deposited in a pile in one section of the working face.

Wastes capable of creating nuisance dusts or possessing occupational airborne exposure limits will be covered as soon as possible, and received only in a dampened or bagged condition. Any personnel outside of enclosed filtered cabs will wear dust protection, and direct contact will be minimized. Gloves and coveralls are provided and will be cleaned whenever needed.

Industrial Process Waste: Sludge: For the purposes of this section, sludge is defined as wet or semi-solid waste materials that contain no free liquids, as defined and characterized by the US EPA "paint filter test". In general, sludges will be co-disposed with other solid wastes in the active disposal area. Sludges that will benefit from drying and will not create a dust problem may be spread out and allowed to dry somewhat before co-disposal. Certain sludge wastes may require stabilization or solidification before disposal for handling or environmental reasons. Sludge may be accepted if it is manageable, nonhazardous, and does not contain more than 25 gallons of free liquid per load.

E. Nondigested Sewage Sludge, Septic Tank Pumpings

Will not be accepted without specific authorization by the ODEQ.

F. Pollution Control Process Wastes

These materials will be managed as an industrial process waste.

G. Empty Drums or Containers

1. Empty pesticide containers (rigid) will be certified as triple rinsed and one end removed. They will be crushed by the generator or on site and co-disposed with other solid waste. Non-rigid

containers, i.e. bags, will be properly packaged if a dust problem from residual granular product will be created by disposal.

2. Drums, empty, contained hazardous waste - generally, if properly documented and approved by a special waste decision, "RCRA-empty" drums with one end removed may be accepted. They will be crushed and co-disposed. MSDS sheets on the contents are required. The option of recycling these containers will be discussed with the generator/customer.

3. Drums, empty, contained nonhazardous waste - MSDS sheet verifying previous contents will be required. Containers accepted if one end removed and empty. They will be crushed and co-disposed. The option of recycling these containers will be discussed with the generator/customer.

H. Infectious Waste

Untreated infectious waste will not be approved for acceptance after July 1, 1990. Treated infectious waste will be disposed in accordance with Chapter 763 - Oregon Laws 1989, and all regulations written as a consequence of this law.

As of July 1, 1990, the site will accept cultures and stocks, sharps and biological waste, if treated by a method approved by the Environmental Quality Commission. Treated pathological waste cannot be accepted at this landfill without a determination that it is from an area where incineration is not reasonably available, as defined by ODEQ regulation number OAR 340-61-060 (3)(d). Documentation from ODEQ that this determination has been properly made must accompany any request to receive treated pathological waste.

Sterilized infectious waste loads will be received and covered immediately with other waste.

Loads of containerized sharps, which according to OAR 340-61-060(3)(d)(B) are not required to be sterilized, will not be compacted before being covered with other waste or soil. Unsterilized sharps disposed in this manner must be containerized in a leak-proof, rigid, puncture-resistant, red container that is taped closed or tightly lidded to prevent loss of the contents. Sharps will either be disposed at the same location as asbestos or at another segregated area of the landfill. If disposed along with asbestos waste, it will be done in a manner that assures uncovered asbestos containers are not damaged.

I. Infectious Waste Incinerator Ash

Infectious waste incinerator ash may not be co-disposed unless the results of the TCLP analysis do not exceed one-tenth of the regulatory standards for heavy metals, unless otherwise approved by ODEQ. It must be bagged or dampened to reduce dust. Infectious waste incinerator ash will be covered with other waste or cover material as soon as possible. If a municipal waste

incinerator ash monofill is developed, infectious waste incinerator ash may be placed in the monofill.

J. Municipal Waste Incinerator Ash

Municipal waste incinerator ash will be monofilled in accordance with Permit #391. Detailed design and operating plans will be provided to ODEQ for approval prior to the disposal of municipal incinerator ash.

K. Tires

Condition A.10 of ODEQ Permit #391, as revised in June, 1991, includes the following:

> "Up to 2,000 waste tires may be received, stored and removed in accordance with OAR 340-64-050(1), and the site Operations Manual. Waste tires shall be received primarily, and removed only, by waste tire carriers permitted by the Department. The permittee shall maintain a written contract for removal of waste tires. If the contract to remove waste tires becomes void, and the permittee wants to store more than 100 waste tires, the permittee shall advise the Department of such change, and shall contract with another waste tire carrier permitted by the Department.
>
> Waste tires shall not be disposed in the landfill, except in accordance with OAR-340-64-052. Unless otherwise approved by the Department, waste tires may be disposed in the landfill only if:
>
> a. The waste tires are chipped in accordance with standards established by the Environmental Quality Commission;
>
> b. The waste tires are received from a solid waste collector, operating under a license or franchise from any local governments unit, who transports fewer than 10 tires at any one time; or
>
> c. The waste tires are received from a person transporting fewer than five tires in combination with the person's own solid waste for disposal."

Note: On July 1, 1991, Senate Bill 66 became effective. This law forbids the disposal of tires, and does not specify any small quantity exception.

It is believed that the permit's reference to OAR 64 is a typographical error, and is meant to refer to OAR 62. OAR 340-62 should be consulted for more detailed information.

Under OAR 340-62-050(2), up to 2,000 tires can be stored without special permitting if the following is provided:

- A description of the storage method is submitted to ODEQ; and
- A contract for tire removal with a tire carrier is maintained.

L. **Off Specification, Outdated, Unused, Contaminated or Banned Commercial Products**

These materials will be accepted, preferably in original container, providing they are not otherwise unacceptable waste or create an occupational exposure problem that cannot be mitigated by a modified disposal method (additional packaging, wetting, solidification, etc.).

M. **Liquids**

The permit allows free liquids in quantities less than 25 gallons per load; otherwise, this landfill does not accept free liquids. Wastes containing free liquids must have a suitable nonhazardous absorbent added or be in a consumer-sized container (i.e. less than or equal to five gallons) for disposal.

N. **Other Wastes**

Management practices for special wastes not specified herein will be evaluated on a case by case basis.

spwtco10.91
/rt

APPENDIX B

Profile Sheet

WASTE MANAGEMENT OF NORTH AMERICA

GENERATOR'S SPECIAL WASTE PROFILE SHEET
TYPE A WASTE
INSTRUCTIONS

orm n on this form is used to determine if the waste may be transported, treated, stored or disposed gal, safe, and environmentally sound manner. This information will be maintained in strict confidence. ers must be printed in ink or typed. A response of "NONE," or "NA" can be made if appropriate.

RT A. WHERE IS THE WASTE GENERATED?

GENERATOR NAME - Enter the name of the facility where the waste is generated.
FACILITY ADDRESS - Enter the street address (not P.O. Box) of the facility where the waste is generated.
GENERATOR CITY, STATE/PROVINCE - Enter the city and state or province.
ZIP/POSTAL CODE - Enter the generating facility's zip or postal code.
GENERATOR USEPA/CANADIAN FEDERAL ID - Enter the identification number issued by the USEPA or CANADIAN FEDERAL AGENCY to the facility generating the waste (if applicable).
GENERATOR STATE/PROVINCIAL ID - Enter the identification number issued by the state or province to the facility generating the waste (if applicable).
TECHNICAL CONTACT - Enter the name of a person who can answer technical questions about the waste.
PHONE - Enter technical contact's telephone number.

ART B. WHERE ARE WASTE MANAGEMENT OF NORTH AMERICA INVOICES MAILED?

. If you want the invoice mailed to the same address as in PART A, check "Generating Facility." If you want the invoices mailed elsewhere, then answer Questions 2, 3, 4, 5 and 6.
. COMPANY NAME - Enter the name of the company which will receive invoices.
. PHONE - Enter the telephone number of the company receiving invoices.
. ADDRESS - Enter the address of the company receiving invoices.
. CITY, STATE/PROVINCE - Enter the city and state or province of the company receiving invoices.
OSTAL CODE - Enter the zip or postal code of the company receiving invoices.

ART C. PHYSICAL CHARACTERISTICS OF WASTE

1. NAME OF WASTE - Enter a name generally descriptive of this waste. (e.g. paint sludge; contaminated soil, incinerator ash)
2. PROCESS GENERATING WASTE - List the specific process/operation or source that generates the waste. (e.g. paint spray booth, spill clean up, incineration of municipal refuse)
3. SPECIAL HANDLING INSTRUCTIONS - Describe any special handling requirements for proper management of the waste.
4. COLOR - Describe the color of the waste (e.g., blue, transparent, varies).
5. ODOR - **DO NOT SMELL THE WASTE!** If the waste has a known incidental odor, then describe it (e.g., acrid, pungent, solvent, sweet).
6. PHYSICAL STATE - If the four boxes provided do not apply, a descriptive phrase may be entered after "Other" (e.g., gas).
7. LAYERS - Check all applicable boxes. Multi-layered means more than two layers (e.g., oil/water/sludge). Bi-layered means the waste is comprised of two layers which may or may not be of the same phase(e.g., oil/water, solvent/sludge). Single phased means the waste is homogeneous.
8. SPECIFIC GRAVITY - Indicate the range. The specific gravity of water is 1.0. Most organics are less than 1.0. Most inorganics and paint sludge are greater than 1.0.
9. FREE LIQUIDS - Check "YES" if liquid is usually present when packaging for shipment and estimate the percent of liquid volume. Check "NO" if there are no free liquids as determined by the Paint Filter Test or direct observation.
10. pH - Indicate for liquid portions of the waste. Check the appropriate boxes which cover the pH of e waste. Use the "Range" space if appropriate. For solid or organic liquid wastes, indicate the pH 10% aqueous solution of the waste if applicable. Check "NA" for non-water soluble materials (e.g., foundry sands).
11. FLASH POINT - Indicate the flash point obtained using the appropriate testing method.

Side 1 of 2
Form WMNA-0089A (2/89) Waste Management of North America

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WASTE MANAGEMENT OF NORTH AMERICA

ART D. TRANSPORTATION INFORMATION

ME D OF SHIPMENT - Indicate the anticipated method of shipment by checking the appropriate x.

ANNUAL AMOUNT/UNITS - Enter the amount of special waste that will be generated and transported annually. Use appropriate units to describe this volume (e.g., cubic yards, gallons, kilograms, pounds).

SUPPLEMENTAL INFORMATION - Enter any additional shipping information.

INDICATE IF THIS WASTE IS A USDOT OR CANADIAN FEDERAL HAZARDOUS MATERIAL. If so, answer Questions 5, 6, and 7 below:

HAZARD CLASS/ID - Enter the proper USDOT or Canadian Federal hazard class/enter the proper USDOT or Canadian Federal Identification Number

REPORTABLE QUANTITY (RQ)/RQ Units (lb/kg)/Enter the Reportable Quantity for this waste. Indicate the appropriate units for the RQ.

SHIPPING NAME - Enter the proper USDOT or Canadian Federal shipping name for this waste.

ART E. CHEMICAL COMPOSITION

1. List all organic and/or inorganic components of the waste using specific chemical names. If trade names are used, attach Material Safety Data Sheets or other documents which adequately describe the composition of the waste. For each component, estimate the range (in percents) in which the component is present. The total of the maximum values of the components must be greater than or equal to 100% including water, earth, etc.
2. If this waste contains PCBs, cyanides, phenolics or sulfides, indicate the concentration(s). If this waste does not contain these constituents, indicate by checking the "NO" box(es) which apply. If the concentration of these constituents is unknown, please indicate "UNK" under "ACTUAL".

PART F. METALS

1. Indicate whether any of the heavy metals are present in the waste. For each metal, check the box indicating that the metal content will not exceed the stated amount or enter the actual metal content, in parts per million, if available. If metals concentrations are unknown or not present indicate by writing "UNK" or "NA" respectively.
2. If actual concentrations are provided, indicate whether results were determined by the EP TOX (extraction procedure toxicity) or TCLP (Toxicity Characteristics Leaching Procedure) method, or whether the value represents the total metal concentrations.

PART G. GENERATOR CERTIFICATION

By signing this Special Waste Profile Sheet the generator certifies that the statements in Nos. 1, 2, 3 and 4 are true and accurate with respect to the waste streams listed.

5. SIGNATURE - An authorized employee of the generator must sign this Generator's Special Waste Profile Sheet.
6. TITLE - Enter employee's title.
7. NAME - Enter employee's name.
8. DATE - Enter the date signed.

KEEP A COPY OF THIS GENERATOR'S SPECIAL WASTE PROFILE SHEET FOR YOUR RECORDS. SEND THE ORIGINAL AND ATTACHMENTS TO YOUR WASTE MANAGEMENT OF NORTH AMERICA SALES REPRESENTATIVE.

Waste Management of North America

GENERATOR'S SPECIAL WASTE PROFILE SHEET

TYPE A Waste

PLEASE PRINT IN INK OR TYPE

WMA 17410

Waste Profile Sheet Code

STRUCTIONS FOR COMPLETING THIS FORM ARE ATTACHED

(Shaded Areas For WMNA Use Only)

WMNA Sales Rep#:

enewal Date of Service Agreement:

. WHERE IS THE WASTE GENERATED?

. Generator Name:

. Facility Address (site of waste generation):

. Generator City, State/Province:

. Generator USEPA/Federal ID:

. Generator State/Province ID:

. Technical Contact:

4. Zip/Postal Code:

8. Phone: ( ) -

I. WHERE ARE WASTE MANAGEMENT, INC. INVOICES SENT?

. ☐ Generating Facility (A, above), or

. Company Name:

. Address:

. Generator City, State/Province:

3. Phone: ( ) -

6. Zip/Postal Code:

CAL CHARACTERISTICS OF WASTE (See Instructions)

f Waste:

2. Process Generating Waste:

3. Special Handling Instructions:

4. Color	5. Does the waste have a strong incidental odor? ☐ No ☐ Yes If so, describe:	6. Physical State @ 70°F/21°C: ☐ Solid ☐ Semi-Solid ☐ Liquid ☐ Powder Other:	7. Layers ☐ Multi-layered ☐ Bi-layered ☐ Single Phased	8. Specific Gravity: Range -	9. Free Liquids: ☐ Yes ☐ No Volume: %

10. pH: ☐ ≤ 2 ☐ > 2-4 ☐ 4-7 ☐ 7 ☐ 7-10 ☐ 10- < 12.5 ☐ ≥ 12.5 ☐ Range ☐ NA

11. Flash Point: ☐ None ☐ <140°F/60°C ☐ 140°-199°F/60°-93°C ☐ ≥ 200°F/93°C ☐ Closed Cup ☐ Open Cup

D. TRANSPORTATION INFORMATION

1. Method of Shipment: ☐ Bulk Liquid ☐ Bulk Sludge ☐ Bulk Solid ☐ Drum/Box ☐ Other

2. Annual Amount/Units:

3. Supplemental Information:

4. s this a DOT hazardous material? ☐ No ☐ Yes (If so, complete 5, 6 &7)

5. Hazard Class/ID #:

rtable Quantity/ Units (lb/kg):

7. Shipping Name:

☐ Check this box if additional information is attached.

Turn Page and Complete Side 2

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Waste Management of North America

GENERATOR'S SPECIAL WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

E. CHEMICAL COMPOSITION

	RANGE MIN.-MAX.
	- %
	- %
	- %
	- %
	- %
	- %
	- %
	- %
	- %
	- %
	- %
	- %
	- %

Please note: The chemical composition total in the maximum column must be greater than or equal to 100%. Total: _____ %

2. Does this waste contain any of the following (provide concentration if known):

	NO or	LESS THAN or	ACTUAL
PCB's	☐	☐ <50 ppm	_____ ppm
Cyanides	☐	☐ <50 ppm	_____ ppm
Sulfides	☐	☐ <50ppm	_____ ppm
Phenolics	☐	☐ <50 ppm	_____ ppm

F. METALS

1. Does this waste contain any of the following metals (provide concentration if known):

Arsenic	☐ <5	or _____ ppm	Barium	☐ <100	or _____ ppm	Cadmium	☐ <1	or _____ ppm
Chromium	☐ <5	or _____ ppm	Lead	☐ <5	or _____ ppm	Mercury	☐ <0.2	or _____ ppm
Selenium	☐ <1	or _____ ppm	Silver	☐ <5	or _____ ppm	Copper	☐	_____ ppm
Nickel	☐	_____ ppm	Zinc	☐	_____ ppm			_____ ppm

2. Indicate method used to determine concentration (if provided): ☐ EP TOX ☐ TCLP, or ☐ Total

G. GENERATOR CERTIFICATION

By signing this profile sheet, the generator certifies that unless clearly stated above or in attachments:

1. This waste is not a "Hazardous Waste" as defined by USEPA or Canadian Federal regulation and/or the state/province.
2. This waste does not contain regulated quantities of PCB's (Polychlorinated Biphenyls).
3. This sheet and its attachments contain true and accurate descriptions of the waste material. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed.
4. The Contractor's Definition of Special Waste (Form WMNA 0038 AD) has been read, signed and attached.

5. Signature _____ 6. Title _____

7. Name (Type or Print) _____ 8. Date _____

WASTE MANAGEMENT OF NORTH AMERICA
GENERATOR'S SPECIAL WASTE PROFILE SHEET
TYPE B WASTE
INSTRUCTIONS

Information on this form is used to determine if the waste may be transported, treated, stored or disposed in a legal, safe, and environmentally sound manner. This information will be maintained in strict confidence. Answers must be printed in ink or typed. A response of "NONE," or "NA" can be made if appropriate.

PART A. WHERE IS THE WASTE GENERATED?

1. GENERATOR NAME - Enter the name of the facility where the waste is generated.
2. FACILITY ADDRESS - Enter the street address (not P.O. Box) of the facility where the waste is generated.
3. GENERATOR CITY, STATE/PROVINCE - Enter the city and state or province.
4. ZIP/POSTAL CODE - Enter the generating facility's zip or postal code.
5. GENERATOR USEPA/CANADIAN FEDERAL ID - Enter the identification number issued by the USEPA or CANADIAN FEDERAL AGENCY to the facility generating the waste (if applicable).
6. GENERATOR STATE/PROVINCIAL ID - Enter the identification number issued by the state or province to the facility generating the waste (if applicable).
7. TECHNICAL CONTACT - Enter the name of a person who can answer technical questions about the waste.
8. PHONE - Enter technical contact's telephone number.

PART B. WHERE ARE WASTE MANAGEMENT OF NORTH AMERICA INVOICES MAILED?

1. If you want the invoice mailed to the same address as in PART A, check "Generating Facility." If you want the invoices mailed elsewhere, then answer Questions 2, 3, 4, 5 and 6.
2. COMPANY NAME - Enter the name of the company which will receive invoices.
3. PHONE - Enter the telephone number of the company receiving invoices.
4. ADDRESS - Enter the address of the company receiving invoices.
5. CITY, STATE/PROVINCE - Enter the city and state or province of the company receiving the invoices.
6. ZIP/POSTAL CODE - Enter the zip or postal code of the company receiving invoices.

PART C. WASTE STREAM INFORMATION

1. NAME OF WASTE - Enter a name generally descriptive of this waste. (e.g. untreated bio-medical, asbestos, fluorescent bulbs)
2. PROCESS GENERATING WASTE - List the specific process/operation or source that generates the waste. (e.g. nursing home, asbestos removal, building maintenance)
3. METHOD OF SHIPMENT - Indicate the anticipated method of shipment by checking the appropriate box.
4. ANNUAL AMOUNT/UNITS - Enter the amount of special waste which will be generated and transported annually. Use appropriate units to describe this volume (e.g., cubic yards, gallons, kilograms, pounds).
5. SUPPLEMENTAL INFORMATION - Answer the following questions for the Type B Waste listed.

The following waste types are classified by Waste Management as "Type B Special Wastes." If your waste corresponds to one of the following classifications, provide the supplemental information requested after each applicable definition.

A. **Friable asbestos waste from building demolition or cleaning; wall board, wall or ceiling spray coverings, pipe insulation, etc.** This does not include nonfriable asbestos unless it has been processed, handled or used in such a way that asbestos fibers may be freely released. Asbestos-bearing industrial process waste is a "Type A Special Waste." List the source (e.g., building demolition, pipe insulation removal) of the asbestos or asbestos containing material(s) and the type of asbestos containing material (e.g., pipe insulation). List the proper USEPA or Federal (and/or state or provincial) waste identification code (if applicable). List the wetting agent(s) used to wet the asbestos material before packaging and include its chemical composition or a current Material Safety Data Sheet. List the size and type of container(s) that will be used to contain the asbestos. Indicate whether the asbestos has been contaminated with any other wastes, and if so, list them.

B. **Commercial products or chemicals which are off-specification, outdated, unused, or banned.** Outdated or off-specification uncontaminated food or beverage products in original consumer containers are not included in this category, however, containers which once held commercial products or chemicals are included unless the container is empty. A container is empty when:
All wastes have been removed that can be removed using the practices commonly employed to remove materials from the type of container, e.g., pouring, pumping or aspirating, and an end has been removed (for containers in excess of 25 gallons), and no more than 1 inch (2.54 centimeters) of residue remains on the bottom of the container or inner liner, or no more than 3% by weight of the total capacity of the container remains in the container (containers $\leq$ 110 gallons), or no more than 0.3% by weight of the total capacity of the container remains in the container (containers > 110 gallons.) Containers which once held ACUTELY HAZARDOUS WASTES must be triple rinsed with an appropriate solvent or cleaned by an equivalent method. Containers which once held substances regulated under the Federal Insecticide, Fungicide, and Rodenticide Act must be empty according to label instructions or triple rinsed with an appropriate solvent.

List the commercial product or chemical and include the proper waste identification code (if applicable) for that material. List whether the commercial product or chemical has been banned, if so, why and by what agency. List whether the commercial product or chemical is off-specification and why. Attach copies of the most current Material Safety Data Sheets, if they exist. Indicate the current state of the waste. (e.g. sludge, liquid, solid.)

C. Untreated bio-medical waste - Any waste capable of inducing infection due to contamination with infectious agents from bio-medical sources including but not limited to a hospital, medical clinic, nursing home, medical practitioner, mortuary, taxidermist, veterinarian hospital, animal testing laboratory, or university medical testing laboratory. Sharps from these sources must be rendered harmless or placed in needle puncture proof containers. Residue from incineration of infectious waste is a "Type A Special Waste."
List the source from the list above. List the specific waste type(s) and include appropriate warnings for the handling of these wastes. Indicate any special requirements for the labeling, packaging and storage of these waste types.

D. Treated bio-medical wastes - Any wastes from a bio-medical source including but not limited to a hospital, medical clinic, nursing home, medical practitioner, mortuary, taxidermist, veterinarian hospital, animal testing laboratory, or university medical testing laboratory which has been autoclaved or otherwise heat treated or sterilized so that it is no longer capable of inducing infection. Any sharps from these sources must be rendered harmless or placed in needle puncture proof containers. List the source from the list above. Specify how the waste was treated.

E. Liquids and sludges from septic tanks, food service grease traps, or washwater and wastewaters from commercial laundries, laundromats and car washes unless these wastes are managed at public or commercial treatment works. Indicate the physical state of the waste (e.g., liquid, sludge, solid). List the specific source(s) (e.g., septic tank pumpings from hotel) of the waste and indicate whether there are any industrial discharges incorporated into the waste. Indicate whether or not a commercial laundry cleans clothing that may be contaminated with chemicals from an industrial facility. List the types of vehicles cleaned at car washes. Include a statement that indicates whether the interiors of any truck, the exteriors of bulk chemical or waste tank trucks are washed.

F. Chemical-containing equipment removed from service (e.g., filters, acetylene tanks, cathode ray tubes, lab equipment, fluorescent light tubes etc.).
List the specific equipment removed from service and any additional information pertaining to the chemical contained in that equipment, including type, concentration and volume.

G. Waste produced from the demolition or dismantling of industrial process equipment or facilities contaminated with chemicals from the industrial process. Chemicals or residues removed or drained from such equipment or facility are "Type A Special Wastes."
List the waste type(s) (e.g., piping, pumps, tanks) and the process type(s) from which they came. Indicate whether there are residuals contained in the process equipment. Describe the process used to decontaminate the equipment and list any chemicals or mixtures of chemicals that were used in the cleaning process. Attach copy of the most current Material Safety Data Sheets for each of the chemicals used in the original process, the end product of the process, and the chemicals or mixtures of chemicals used in the cleaning process. Indicate whether this waste is contaminated with asbestos or asbestos insulation.

Attachments: Include any additional information that you feel would assist in determining the proper method(s) for transportation, treatment, storage and disposal of your "Type B Special Waste." Provide a list of the attachments that you have included in your submittal.

6. INDICATE IF THIS WASTE IS A USDOT/CANADIAN FEDERAL HAZARDOUS MATERIAL. If so, complete Questions 7, 8, and 9.
7. HAZARD CLASS/I.D.# Enter the proper USDOT or Canadian Federal hazard class/enter the proper USDOT or Canadian Federal Identification Number
8. REPORTABLE QUANTITY (RQ)/RQ Units (lb/kg)/Enter the Reportable Quantity for this waste/indicate the appropriate units for the RQ.
9. SHIPPING NAME - Enter the proper USDOT or Canadian Federal shipping name for this waste.

PART D. GENERATOR CERTIFICATION

By signing this Special Waste Profile Sheet the generator certifies that the statements in Nos. 1, 2, 3 and 4 are true and accurate with respect to the waste streams listed.

5. SIGNATURE - An authorized employee of the generator must sign this Generator's Special Waste Profile Sheet.
6. TITLE - Enter employee's title.
7. NAME - Enter employee's name.
8. DATE - Enter the date signed.

KEEP A COPY OF THIS GENERATOR'S SPECIAL WASTE PROFILE SHEET FOR YOUR RECORDS. SEND THE ORIGINAL AND ATTACHMENTS TO YOUR WASTE MANAGEMENT OF NORTH AMERICA SALES REPRESENTATIVE.

Waste Management of North America

GENERATOR'S SPECIAL WASTE PROFILE SHEET

TYPE B Waste

PLEASE PRINT IN INK OR TYPE

☐ WMA 105702
Waste Profile Sheet Code

STRUCTIONS FOR COMPLETING THIS FORM ARE ATTACHED

(Shaded Areas For WMNA Use Only)

newal Date of Service Agreement: WMNA Sales Rep#:

WHERE IS THE WASTE GENERATED?

Generator Name:
Facility Address (site of waste generation):
Generator City, State/Province: 4. Zip/Postal Code:
Generator USEPA/Federal ID:
Generator State/Province ID:
Technical Contact: 8. Phone: ( ) -

WHERE ARE WASTE MANAGEMENT, INC. INVOICES SENT?

☐ Generating Facility (A, above), or
Company Name: 3. Phone: ( ) -
Address:
Generator City, State/Province: 6. Zip/Postal Code:

STREAM INFORMATION:

Name of Waste:
Process Generating Waste:
Method of Shipment: ☐ Bulk Liquid ☐ Bulk Sludge ☐ Bulk Solid ☐ Drum/Box ☐ Other
Annual Amount/Units:
Supplemental Information (see instructions):

Is this a DOT hazardous material? ☐ No ☐ Yes (If so, complete 7, 8 & 9) 7. Hazard Class/ID #:
Reportable Quantity/ Units (lb/kg): 9. Shipping Name:

☐ Check this box if additional information is attached.

). GENERATOR CERTIFICATION

By signing this profile sheet, the generator certifies that unless clearly stated above or in attachments:

1. This waste is not a "Hazardous Waste" as defined by USEPA or Canadian Federal regulation and/or the state/province.
2. This waste does not contain regulated quantities of PCB's (Polychlorinated Biphenyls).
3. This sheet and its attachments contain true and accurate descriptions of the waste material. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed.
4. The Contractor's Definition of Special Waste (Form WMNA 0038 AD) has been read, signed and attached.

5. Signature 6. Title

7. Name (Type or Print) 8. Date

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G

ONEticket Tab Page

the Milton-Freewater event has ranged from 5.8 (Jacobson 1986) to 6.2 (Zollweg, personal communication, 1992) and had a Modified Mercalli Intensity of VII-VIII (see Table G-2), with Intensity V in the Hermiston area (US Army Corps of Engineers 1993). In the vicinity of the Wallula fault zone, the earthquake was associated with ground breakage and possible localized liquefaction features (Mann and Meyers, in preparation). The location of these features strongly suggest the earthquake was generated by movement in the Wallula fault zone.

An earthquake centered near Umatilla on March 3, 1893 had a Modified Mercalli Intensity of VII. Jacobson (1986) estimated, based on the Intensity VII, that this earthquake had a Richter magnitude of 5.7. However, Zollweg (personal correspondence 1992), suggests the Umatilla earthquake was a relatively small earthquake on the order of Richter magnitude 4.5 that occurred at a very shallow depth (<2 mi). This is supported by the fact that the Umatilla earthquake was felt over a very localized area. The source structure for the Umatilla earthquake has not been identified.

This past summer, a 3.7 magnitude earthquake was recorded in the Hermiston-Umatilla area; and a 4.2 magnitude earthquake occurred in the Milton-Freewater area.

Regional MCE Estimates -- Project Order Addendum 2 Paragraph II.C.1

Pertinent faults within a 100-km radius of the site, and their estimated maximum credible earthquakes ("MCE") and corresponding peak bedrock accelerations ("PGA") are summarized in Table G-3. The values in Table G-3 represent the most recent quantitative estimates of seismic risk for the region. Gary Mann of the U.S. Geological Survey is currently preparing a paper on the OWL; however, his draft paper does not include estimates of MCE for either the OWL or the Wallula fault segments (Mann, in preparation). As shown in Table G-3, the MCE for the site corresponds to a 6.5 Richter magnitude event occurring on the Wallula fault zone at a distance of 30 miles from the site. Using the empirically derived curves for PGA (Campbell 1981; Joyner and Boore 1981), the estimated PGA for the site is 0.34 times gravity (g). This compares favorably with the recent Johnson and Scofield (1991) estimate of an MCE of Richter magnitude 6.7 and 0.3+g PGA for northeastern Oregon. A 5.5 Richter magnitude event at or near the site, or centered on the Service anticline 4 miles east of the site would produce an estimated PGA of 0.22 to 0.25 g.

Groundwater levels are important in evaluating potential seismic hazards because shallow groundwater in unconsolidated, sandy material can contribute to liquefaction potential. Static

water levels recorded during 1969 and 1973 for the three Lamb Weston wells indicate that water levels fluctuate throughout the year with typically the highest levels recorded in the winter and spring and lowest levels at the end of the summer. The lowest water level recorded for the wells was 85 feet for Well #1, the high water level recorded was 31 feet in Well # 3. Similar depths to ground water are anticipated at the plant site.

Mitigation of Potential Impacts

The following measures will be taken to offset potential seismic impacts associated with the Generating Project:

1. As discussed in Exhibit B, Project structures will be designed and constructed to minimize potential damage from strong ground shaking. This will include compliance with UBC requirements.

2. Project structures will be founded in dense materials beneath unconsolidated surface materials to offset potential impacts from differential settlement.

3. Placement of electrical transmission towers will avoid or other wise mitigate for, to the extent practical, the narrow strip of alluvium along the Umatilla River that may be subject to liquefaction;

Detailed Geotechnical Investigation -- Project Order Addendum 2 Paragraph II.C.2

In addition, prior to construction, a detailed geotechnical investigation will be performed at the Project site to evaluate the subsurface conditions and further evaluate the potential for liquefaction, as well as provide information for foundation design, site preparation and grading, and roadway design.

DOE and EFSC Review of Results

The results of the investigation will be submitted to the Oregon Department of Energy (ODOE) and the Energy Facility Siting Council (EFSC) for review.

Proposed Scope of Investigation

The geotechnical investigation will include groundwater observation wells, soil borings, and various testing. The exact scope and methodology that will be employed for the investigation will partially depend on the subsurface characteristic encountered at the site. The expected scope of the investigation will include:

- Borings beneath the footprint of key structures to define subsurface conditions across the site. The borings will be of sufficient depth (depending on subsurface conditions encountered) to define subsurface conditions to the anticipated depth of influence for the major foundation elements. Disturbed and undisturbed soil samples will be collected for visual and laboratory analysis of soil characteristics.

- Depending on subsurface conditions laboratory tests may include:

  - Moisture Content (ASTM D 2216)
  - Unit Weight
  - Specific Gravity (ASTM D 854)
  - Sieve Analysis (ASTM D 422)
  - Atterberg Limits (ASTM D 4318)
  - Chemical Analysis (chloride, sulfate, pH)
  - Moisture Density Testing (ASTM D 1557)
  - Unconfined Compression Test (Soil ASTM D 2166 or Rock ASTM D 2938)
  - Unconsolidated Undrained Triaxial Test (ASTM D 2850)
  - Consolidated Undrained Triaxial Test with Porepressure Measurements
  - Consolidation Test (ASTM D 2435)

- Standard Penetration Tests (SPT) at specified intervals to correlate blow counts to various soil properties.

- Cone penetration, piezocone, dilatometer, and vane shear as appropriate to determine penetration resistance, hydraulic characteristics, deformation characteristics, and shear strength of soils. These data can be used in determining bearing pressure and settlement, and pile capacity if necessary.

- Field resistivity to obtain data for switchyard and other grounding purposes.

- Installation of groundwater observation wells to determine groundwater depths for potential influence on foundations and liquefaction potential.

Expected locations of groundwater observation wells, soil borings, and other tests are identified on Figure G-5. Locations are approximate and may vary depending on site conditions identified.

Technical specifications for subsurface investigations and laboratory testing are included as an appendix to this Exhibit.

Schedule, Completion Prior to Building Codes Agency Review of Project Plans

To meet an expected construction schedule beginning in early 1994, it is anticipated that the geotechnical investigations will be conducted in the fourth quarter of 1993 to allow for the evaluation of results prior to completion of final facility design and submittal of project plans to the Building Codes Agency.

Modifications to Seismic Characterization and Facility Design

The results of this investigation will be used to confirm the seismic characterization of the site. If this investigation identifies features that dictate a modification of the seismic characterization of the site, project design will be revised as necessary to incorporate any necessary measures to ensure both the integrity of the facility and compliance with all applicable building standards.

PROJECT ORDER, PARAGRAPH 15.

Consideration was given to work by Mann and Pogue as required in the Project Order. Mann's work evaluated historical movement along the Wallula Fault Zone. His work indicates evidence of Late Quaternary to Holocene movement along this fault zone. This is consistent with work by others in this area. Pogue (1992) was contacted regarding the work he had performed in the Project area. He indicated that his work does not represent the most recent work in this area, and that the work described above is more current.

TABLE G-3a

ESTIMATED MAXIMUM CREDIBLE EARTHQUAKES (MCE) AND PEAK BEDROCK ACCELERATIONS (PGA) FOR SIGNIFICANT FAULTS AND STRUCTURES IN THE REGION

Fault or Structure	Distance from Power Plant Site (miles)	Maximum Credible Earthquake	Estimated Peak Bedrock Acceleration (g) Corresponding to MCE	Recurrence Intervals
Service Anticline	4	5.5 (a)	0.22 (e) 0.32 (f)	N/A
Toppenish Ridge Fault	60	7.3 (a)	0.08 (d) 0.9 (f)	1,000's to 10,000's of years (WPPSS 1981)
Wallula-Rattlesnake Alignment	30	6.4 (a) 6.5 (b)	0.34 (e) 0.10 (f)	200 - 1,000 years (Zollweg, personal communication)
Gable Mountain	60	5.9 (a) 5.0 (b)	0.01 (e) >0.05 (f)	10,000 years (WPPSS 1981)
Umatilla Basin	0	5.5 (c)	0.25 (c)	N/A

(a) U.S. Army Corps of Engineers, 1983.
(b) DOE, 1988.
(c) Blume, 1987.
(d) Based on Joyner and Boore, 1981.
(e) Based on Campbell, 1981.
(f) Based on Johnson and Scofield, 1986.

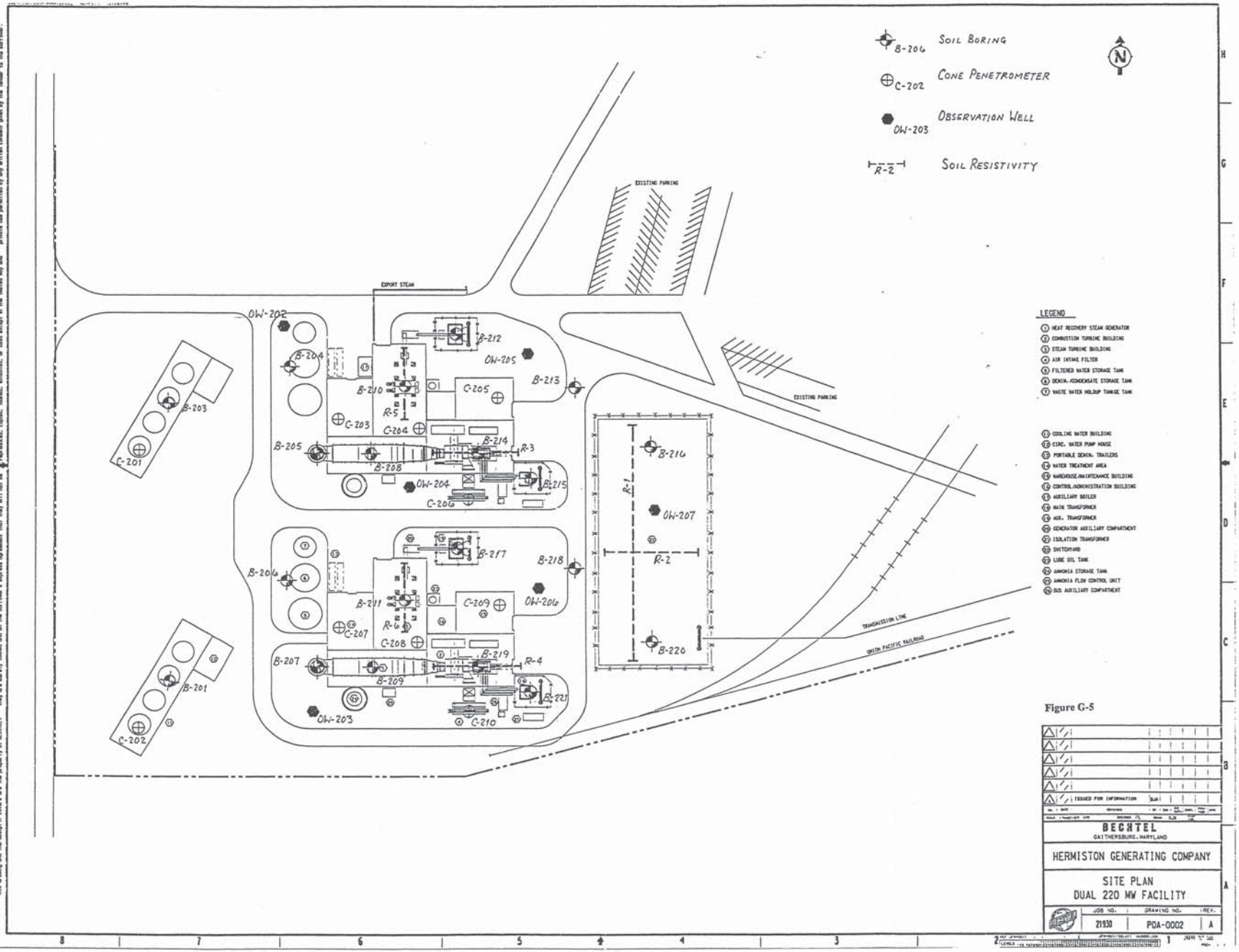
B-206 SOIL BORING
C-202 CONE PENETROMETER
OW-203 OBSERVATION WELL
R-2 SOIL RESISTIVITY
N
EXISTING PARKING
EXPORT STEAM
OW-202
B-204
B-203
C-201
B-212
OW-205
B-213
B-210
C-205
R-5
C-203
C-204
B-205
B-214
R-3
B-208
B-215
OW-204
C-206
B-216
R-1
OW-207
R-2
B-220
B-217
B-218
B-206
B-211
C-209
OW-206
R-6
C-207
C-208
B-207
B-219
R-4
B-209
B-221
OW-203
C-210
B-201
C-202
TRANSMISSION LINE
UNION PACIFIC RAILROAD
LEGEND
1 HEAT RECOVERY STEAM GENERATOR
2 COMBUSTION TURBINE BUILDING
3 STEAM TURBINE BUILDING
4 AIR INTAKE FILTER
5 FILTERED WATER STORAGE TANK
6 DEMIN./CONDENSATE STORAGE TANK
7 WASTE WATER HOLDUP TANKGE TANK
11 COOLING WATER BUILDING
12 CIRC. WATER PUMP HOUSE
13 PORTABLE DEMIN. TRAILERS
14 WATER TREATMENT AREA
15 WAREHOUSE/MAINTENANCE BUILDING
16 CONTROL/ADMINISTRATION BUILDING
17 AUXILIARY BOILER
18 MAIN TRANSFORMER
19 AUX. TRANSFORMER
20 GENERATOR AUXILIARY COMPARTMENT
21 ISOLATION TRANSFORMER
22 SWITCHYARD
23 LUBE OIL TANK
24 AMMONIA STORAGE TANK
25 AMMONIA FLOW CONTROL UNIT
26 BUS AUXILIARY COMPARTMENT
ISSUED FOR INFORMATION
BECHTEL
GAITHERSBURG, MARYLAND
HERMISTON GENERATING COMPANY
SITE PLAN
DUAL 220 MW FACILITY
JOB NO. 21930
DRAWING NO. POA-0002
REV. A

Figure G-5

APPENDIX G-1

TECHNICAL SPECIFICATIONS
FOR
SUBSURFACE INVESTIGATION AND LABORATORY TESTING

Specification 21219-C-1000

TECHNICAL SPECIFICATION

FOR

SUBSURFACE INVESTIGATION AND LABORATORY TESTING

HERMISTON GENERATING FACILITY

HERMISTON, OREGON

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TECHNICAL SPECIFICATION

FOR

SUBSURFACE INVESTIGATION AND LABORATORY TESTING

1.0 SCOPE

1.1 The Contractor shall provide all tools, equipment, labor, qualified personnel and services to perform soil and rock borings, sampling, observation well installation, cone penetrometer testing, resistivity testing, laboratory testing, and reporting of results as indicated in the specification and shown on attachment 1. The Contractor shall also survey in the boring locations and elevations.

1.2 Borings, sampling and testing, and cone penetrometer testing shall be in accordance with the most recent ASTM standards or other recognized standards.

1.3 In this specification, the term "Owner" refers to the US Generating Company, or its representative the Bechtel Corporation.

2.0 FIELD INVESTIGATION

2.1 The Contractor shall notify the Owner of his intention to start exploration operations at least 3 working days before the start of work.

2.2 Borings and Cone Penetrometer Tests (CPT) will be located in the field as shown on attachment 1. All boring and CPT locations will be staked out by the Contractor prior to the start of work. Borings and CPT may be relocated by the Owner after the start of work. The field work will be under the technical direction of the Owner. The Contractor must coordinate the subsurface investigation with local utility companies and the property owner to locate any underground utilities at the site.

2.3 Borings shall be made with appropriate equipment for the type of soil or rock and depth of hole. Casing or other methods shall be used to prevent collapse of the hole. Water level readings shall be taken in the open boreholes as directed by the Owner. Borings shall be grouted up to the surface at the completion of the field work. The grout shall be a bentonite-cement mix subject to approval by the Owner.

2.4 Water used for drilling shall be from a source approved by the Owner. Water shall be from a potable supply. Delivery to the site, if required, shall be by truck or other conveyance intended for potable water storage. On site storage of drilling water shall be in a container intended for potable water storage. If required, the Contractor shall provide a current analysis of the intended water supply indicating the source is within the limits of the national drinking water standards. The use of local surface water sources shall not be permitted. All discharge of uncontaminated water shall be in an environmentally acceptable manner and controlled to prevent excessive erosion or any other damage.

2.5 Samples shall be obtained continuously to a depth of 15 feet and at 5 feet intervals or change of strata thereafter. The Owner may direct continuous sampling to extend below 15 feet under certain conditions. In general, standard penetration test (SPT) split-spoon samples will be taken in non-cohesive soils; in cohesive soils, thin-walled tube samples will be taken in addition to SPT samples, when directed by the Owner. The exact depths and type of sampling will be determined by the Owner.

2.6 SPT samples shall be obtained in accordance with ASTM D 1586. These samples shall be preserved in airtight clean glass jars, labeled to show date, boring number, sample number, blow count, and the depth at which the sample was taken.

2.7 Three-inch diameter thin-walled tube samples shall be obtained in general accordance with ASTM D 1587. The samples shall be either extruded in the field and preserved, or preserved in the tube, as directed by the Owner. All preserved extruded samples and tubes containing samples shall be labeled to show date, boring number, sample number, and the depth at which the sample was taken. All samples shall be handled in a manner to ensure minimum sample disturbance.

2.8 Rock coring shall be performed in accordance with ASTM D 2113 at locations and depths directed by the Owner. The drilling into rock shall be done with a double or triple split-tube core barrel and side discharge diamond bit. The core shall have a minimum diameter of 2 1/8 inches. Penetration into rock is not anticipated to exceed 20 feet. The rock core shall be carefully placed in suitable wooden

boxes that are partitioned so that the rock from each core run will be kept separate. Rock cores shall be suitably labeled and arranged neatly in the boxes. The depths of the run and the amount of recovery shall be clearly marked. Rock cores from two borings shall not be placed in the same box.

2.9 In the top 10 feet of all borings, after collecting the sample from each standard penetration test (SPT) split-spoon sampler for soil testing purposes, a portion of that SPT sample shall be placed in a container for contamination testing as directed by the Owner. The container shall be labeled to show date, boring number, sample number and the depth at which the sample was taken. The contamination test sample shall be delivered/ shipped to a testing laboratory as directed by Owner. Contamination testing is not a part of this contract.

2.10 The sampling apparatus shall be cleaned prior to each use in contamination test sampling in accordance with the applicable case set forth below.

Case I: When Analyzing for Contaminants Other Than Those in Case II

See Attachment 2, ENSR Standard Operating Procedure, Number 7600, For Decontamination of All Field Equipment.

Case II: When Analyzing for Heavy Metals, Volatiles and/or Semi-Volatiles

See Attachment 2, ENSR Standard Operating Procedure, Number 7600, For Decontamination of All Field Equipment.

2.11 The drill rod assemblies, auger flights and other downhole items excluding sampling apparatus shall be cleaned prior to use in each borehole as set forth in Attachment 2.

2.12 Friction-cone penetrometer tests shall be performed at locations and to depths shown on the Boring Location Plan or as designated by the Owner. Tests shall be performed in accordance with ASTM D-3441. All tests shall be performed using a self-contained electrical friction-cone penetrometer, that has the capability of measuring local side friction, the end-bearing component of penetration resistance, and the

pore pressure developed in the soil during penetration. The final data presented shall meet the minimum requirements of ASTM D-3441.

If, after a minimum of 3 attempts, the cone penetrometer cannot be advanced due to obstructions, the borehole shall be advanced using rotary drilling techniques through obstructions or to a maximum penetration of 5 feet, at which time cone penetrometer testing shall be continued.

3.0 OBSERVATION WELLS FOR MEASURING GROUND WATER LEVEL

3.1 Holes for observation wells will be a minimum of 3 inches in diameter and will be kept from caving with temporary casing, recirculating water, or Wyoming-type bentonite, and shall be drilled at least 1 foot below the bottom of the depth interval to be screened. Water used for drilling shall be as provided in Section 2.4. If used, the amount of bentonite to be added to the drilling fluid shall be kept to a minimum. The amount of fluid lost in drilling shall be accurately recorded by the Contractor. If, at any time, the Owner determines that the drilling fluid is unsuitable, the Contractor shall replace it.

3.2 Well screen will consist of minimum 1 1/2-inch slotted Schedule 40 flush-coupled PVC pipe with manufactured slots. The slot size will be determined by the Owner. The gravel pack around the screen will be clean, uniform sand, with a grain-size distribution to be specified by the Owner after examining the natural material. The well section above the screen will be minimum 1 1/2-inch Schedule 40 flush-coupled PVC pipe, equipped with a cap.

3.3 If a seal is necessary above the gravel pack, it will consist of at least 2 feet of tamped bentonite pellets. The well will be backfilled above the seal to the ground surface with a bentonite-cement grout.

3.4 Well Development

3.4.1 All observation wells shall be developed by bailing or pumping until clear, relatively sediment-free water appears. The Contractor shall continue pumping clear water for at least 5 minutes following that time when the return water is determined to be clear, or as directed by the Owner.

3.4.2 Upon completion, each observation well shall be tested by the Owner to confirm that the well is operative. If, as a result of improper installation, a well is considered to be inoperative by the Owner, the Contractor shall, at his own expense, repair or replace the well with a satisfactory well.

4.0 FIELD SOIL RESISTIVITY TESTING

Field testing shall be performed to determine the in-place resistivity of the site soils at the location shown on the attached drawing. Procedures used for such testing shall be in accordance with ASTM G 57.

5.0 LABORATORY TESTING

5.1 Laboratory testing shall consist of the following tests. All testing shall be performed in accordance with the most recent ASTM standards, where applicable. Selection of samples and tests shall be determined by the Owner.

5.2 Identification Tests

a. Moisture Content (ASTM D 2216)

b. Unit Weight

c. Specific Gravity (ASTM D 854)

d. Sieve Analysis (ASTM D 422)

e. Atterberg Limits (ASTM D 4318)

f. Chemical Analysis (Chloride, Sulphate, pH)

5.3 Compaction, Strength and Consolidation Tests

a. Moisture Density Testing (ASTM D 1557)

b. Unconfined Compression Test (Soil ASTM D 2166 or Rock ASTM D 2938)

c. Unconsolidated Undrained Triaxial Test (ASTM D 2850)

d. Consolidated Undrained Triaxial Test with Porepressure Measurements

e. Consolidation Test (ASTM D 2435)

6.0 SUBMITTALS

6.1 Two copies of the driller's log shall be submitted to the Owner within 2 days of the completion of each boring. The log shall contain the following information.

a. Boring number, vertical arrangement, thickness, and classification of the materials penetrated.

b. Elevation, type, and number of each sample taken.

c. Number of blows required for each 6-inch penetration for the standard penetration test.

d. Size and type of equipment used for drilling boring.

e. Elevation of ground water table at time of boring and after 24 hours.

f. Description of samples by visual soil classification system.

g. Date of boring and name of driller.

6.2 Two copies of the CPT test results shall be submitted to the Owner within 2 days of the completion of the test. The cone penetrometer test report shall include the raw data including as a minimum, depth versus tip resistance, local friction, friction ratio, pore pressure (piezocones only), and differential pore pressure ratio (piezocones only) in tabular and graphical forms. The interpretation, where required, will include as a minimum effective overburden pressure, soil classification, relative density, internal friction angle, equivalent SPT-N value, and undrained shear strength.

The pore pressure dissipation test report shall include the raw data including time versus pore pressure measurements in tabular and graphical forms.

6.3 Two copies of the laboratory test data shall be submitted to the Owner within two weeks of the laboratory test assignment.

6.4 Three copies of the final field and laboratory test report shall be submitted to the Owner within three weeks of the laboratory test assignment. This report will include the following information.

a. Final boring logs

b. Final CPT logs

c. Water level observations

d. Field resistivity test results

e. Final laboratory test results

APPENDIX A

QUANTITIES, PRICES, AND DATA

1.0 PRICING

Pricing contained herewith is firm. Contractor understands that payment in accordance with the pricing shown shall constitute full payment for the work specified including all applicable taxes.

Contractor shall furnish all tools, equipment, labor, qualified personnel, and services to survey the borings and to perform soil and rock borings, sampling, installation of observation wells, resistivity tests and laboratory testing in accordance with the provisions of the Contract Document.

If Contractor is delayed during a work item for reasons other than his own doing, standby payment will be made, except in the following situations. Standby payment will not be made for mechanical breakdowns, lost time due to lack of necessary supplies or material, backfilling completed holes or cleanup of work areas, moving between boreholes or obtaining drilling water, or for lost time due to inclement weather or utility clearances.

2.0 UNIT PRICING

Item No.	Estimated Quantity	Description	Unit Price		Extension
2.1	3 Rigs & crew	Mobilization & Demobilization	$	/LS	$_____
2.2	1800 LF	Standard Penetration Boring with Grouting	$	/LF	$_____
2.3	8 EA	Thin Wall Tube Samples	$	/EA	$_____
2.4	60 LF	Rock Coring	$	/LF	$_____
2.5	200 LF	Observation Well	$	/LF	$_____
2.6	4 EA	Field Soil Resistivity	$	/EA	$_____
2.7	5 HR	Standby Time	$	/HR	$_____

Item No.	Estimated Quantity	Description	Unit Price	Extension
2.8	CONE PENETROMETER TESTING			
(a)	0 LF	Friction-Cone Penetrometer Testing	$ /LF	$_____
(b)	800 LF	Friction-Piezocone Penetrometer Testing	$ /LF	$_____
(c)	8 CPT	Interpretation of Penetrometer Test	$ /CPT	$_____
(d)	4 HRS	Pore Pressure Dissipation Test	$ /HR	$_____
2.9	LABORATORY TESTING			
(a)	10	Moisture Content	$ /EA	$_____
(b)	0	Unit Weight	$ /EA	$_____
(c)	1	Specific Gravity	$ /EA	$_____
(d)	30	Sieve Analysis	$ /EA	$_____
(e)	5	Atterberg Limits	$ /EA	$_____
(f)	6	Chemical Analysis (Chloride, Sulfate, pH)	$ /EA	$_____
(g)	3	Moisture Density Testing	$ /EA	$_____
(h)	2	Unconfined compression (soils)	$ /EA	$_____
(i)	5	Unconfined Compression (rock)	$ /EA	$_____
(j)	2	Unconsolidated Undrained Triaxial Compression	$ /EA	$_____

Item No.	Estimated Quantity	Description	Unit Price		Extension
(k)	0	Consolidated Undrained Triaxial Compression With Porepressure (3 Stage)	$	/EA	$_____
(l)	2	Consolidation Test	$	/EA	$_____
2.9	1	Preparation of Final Report	$	/LS	$_____
2.10	1	Survey for Locating Borings and CPTs	$	/LS	$_____
2.11	3 WK	HNU Detector Rental	$	/WK	$_____

Estimated Total $_____

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H

EXHIBIT H

WETLANDS - OAR 345-21-015(1)(h)

INTRODUCTION

Exhibit H requires the submittal of either (1) a completed application to the U.S. Army Corps of Engineers ("Corps") and the Oregon Department of State Lands ("ODSL") for a Section 404 permit under the Clean Water Act and for a state fill and removal permit or (2) a map identifying the location of any jurisdictional wetland, along with certain additional information describing those wetlands. Because the Project will not impact any jurisdictional wetlands, this requirement does not appear to be applicable to the Project.

EXISTING WETLANDS

There are no jurisdictional wetlands at the site of the energy facility. The only areas that may be considered wetlands or other "waters of the United States" subject to Corps or ODSL jurisdiction are located along the electrical transmission line and gas pipeline routes. These include the riparian corridor along the Umatilla River at the point where the transmission line crosses the river, and a small area (about one acre) approximately one quarter of a mile west of the river crossing. The source of water for the small wetland area is irrigation water. A pond that has been used for potato processing wastewater is also located in the southeast corner of Section 1, T4N, R28E. All three of these areas are described in Exhibit N. The High Line Canal is located along the gas pipeline route in Section 31, T4N, R28E. These areas and any features identified on the National Wetlands Inventory Maps in the area of the project facilities are identified on Figure H-1.

POTENTIAL IMPACTS

Development of the Project will not have any impact on any jurisdictional wetlands. The Umatilla River will be spanned by the transmission line, which will not, therefore, impact the river or associated riparian zones. Similarly, the transmission line will either span or otherwise avoid the small wetland area west of the river, as well as the potato wastewater pond. Applicant will not be removing fill from or placing material in any of these areas. The High Line Canal will be crossed by boring under the canal so that this activity will not impact the integrity of the canal or associated wildlife and habitat.

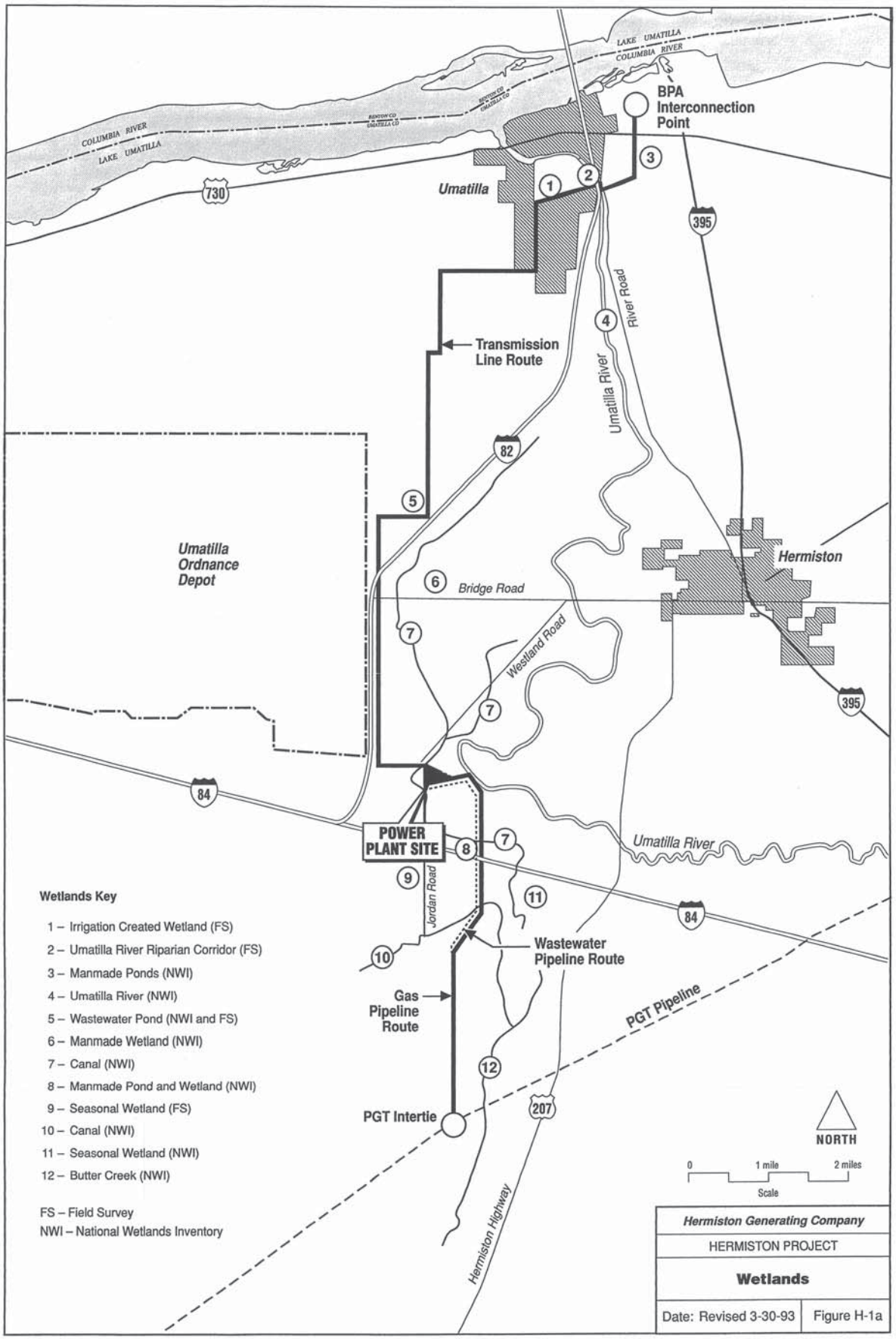

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EXHIBIT I

LAND USE PLANS AND POLICIES

INTRODUCTION

This Exhibit addresses the land use standards for approval of the site certificate application ("SCA"). OAR 345-22-030 requires the EFSC to find that the local governments having jurisdiction over the facility have acknowledged comprehensive plans and zoning ordinances, and that the SCA is consistent with those land use regulations. This Exhibit also contains the information required by OAR 345-21-015(1)(i) which includes:

- maps showing the comprehensive plan designations and zoning of the site and property adjacent to the site (Figures I-2 through I-4);
- a description of the proposed facility's consistency with the acknowledged comprehensive land use plans and land use regulations of the local governments having jurisdiction over the site;
- a description of the proposed facility's consistency with any applicable land use management plan adopted by a federal agency having jurisdiction; and
- a description of the proposed facility's compliance with the applicable criteria and standards of the zoning ordinances of any city with planning jurisdiction over the site.

CONCLUSION

Both Umatilla County (the "county") and the City of Umatilla (the "city"), the two local governments having land use jurisdiction over the Project, have acknowledged comprehensive plans and zoning ordinances. The Project is consistent with the acknowledged comprehensive plans and zoning ordinances of the city and county, and complies with applicable City of Umatilla ordinances. In addition, the Project complies with the applicable Statewide Planning Goals. No federal land use management plan is applicable to the proposed facility.

LAND USE IMPACT AREA

The Project Order issued by the EFSC identifies the land use impact area for the power plant as the area that consists of either the noise boundary as determined by 10 dBA over ambient background noise under normal conditions, or a distance of one-half mile from the energy facility site, whichever is greater. The one-half mile impact area represents the greater distance and has been utilized for analysis of the land use impacts of the Project. For the transmission line and pipeline, the Project Order identifies the land use impact area as provided for in OAR 345-01-010(22)(f) as the area determined by 10 dBA over ambient background noise under normal conditions, or one-half mile from the pipeline or transmission line, whichever is greater. The one-half mile distance represents the greater distance and has been utilized for analysis of land use impacts of these facilities. Figure I-1 shows the land use impact areas.

STANDARD OF REVIEW AND APPLICABLE LAW

1. Standard of Review

The EFSC's Division 22 standards for site certificates require compliance with state law and city ordinances, OAR 345-22-000(1), and consistency with county and city comprehensive plans and land use regulations. OAR 345-22-030. The terms "compliance" and "consistency" are not defined in the EFSC rules.

Under other provisions of state law, state agency decisions affecting land use are required to "comply" with the Statewide Planning Goals, and to be "consistent" or "compatible" with acknowledged comprehensive plans and land use regulations. Statewide Planning Goal 2; OAR 660-30-005; ORS 197.180. Under the LCDC's rules, the term "consistent" is expressly defined as meaning the same thing as "compatible," OAR 660-30-005(7). "Compatibility" is defined by LCDC rule OAR 660-30-005 (5). A state agency action is not "compatible" (or "consistent") if it approves an activity not allowed under the local government's comprehensive plan and land use regulations. ORS 197.180(10). In contrast, "compliance" presumably means that all applicable standards are satisfied. Based on the distinction in the rules with respect to the land use standard for cities and counties and OAR 345-22-000(4) which provides a general preemption of county ordinances, the applicant believes that the EFSC intended that a lower standard be used for evaluating projects in relation to county comprehensive plans and land use regulations (through the use of the terms "consistent" and "consistency").

This exhibit identifies the applicable state, county, and city land use regulations or standards and demonstrates how the Project meets the referenced standards. Following issuance of the Site Certificate by EFSC, the local jurisdictions will act to issue their respective local approvals in accordance with the Site Certificate.

LCDC RULES AND THE STATEWIDE PLANNING GOALS

The Project Order references ORS 197; OAR 660, Divisions 4, 9, 11, 12, 15, 16, 18, and 25; and the Statewide Planning Goals as applicable to the Project.

1. OAR 660, Division 4: "Interpretation of Goal 2 Exception Process"

This rule specifies when exceptions to the Statewide Planning Goals are required, and how such exceptions are to be processed and evaluated. The rule does not apply to the Project because the Project does not require an exception to any of the Statewide Planning Goals and is not located in an exception area. Moreover, Umatilla County has received acknowledgment as to the exception areas in its comprehensive plan, except for the McNary Industrial Site (the Project is not located on this site). The City of Umatilla has taken no exceptions to the Statewide Planning Goals.

2. OAR 660, Division 9: "Industrial and Commercial Development"

This rule sets requirements for county and city comprehensive plans for areas within urban growth boundaries. See OAR 660-09-010(1). The only portion of the Project located within an urban growth boundary is a portion of the transmission line, which is located within the urban growth boundary for the City of Umatilla. Under the Urban Growth Area Management Agreement, the City of Umatilla's comprehensive plan goals and policies are applied inside the UGB. The city's comprehensive plan and land use regulations will be reviewed and amended as necessary to comply with the Division 9 rule at the time of the next periodic review. OAR 660-09-010(2). The city was not directed to comply with this rule at its first periodic review. No amendments are required for this Project.

3. OAR 660, Division 11: "Public Facilities Planning"

This rule applies to areas within an urban growth boundary containing population greater than 2,500. The City of Umatilla is responsible for public facilities planning within the city's urban growth boundary. The Division 11 rule was addressed during the City of Umatilla's most recent periodic review, which terminated on January 8, 1988. See Exhibit I-1. [Periodic Review Report at pp. 12-14]. The city was found to satisfy the requirement.

4. OAR 660, Division 12: "Transportation Planning"

This rule applies to the City of Umatilla and to Umatilla County. However, under OAR 660-12-055(2), the city and county have until May 8, 1996 to adopt Transportation System Plans and implementing measures. The Project does not require amendments to functional plans, acknowledged comprehensive plans, and land use regulations. Thus, OAR 660-12-060 ("plan and land use regulation amendments") does not apply to the Project.

5. OAR 660, Division 16: "Requirements and Application Procedures for Complying With Statewide Goal 5"

This rule has been addressed as a result of the acknowledgment process for Umatilla County's comprehensive plan and land use regulations, with the exception of the McNary industrial site which is not a part of this Project. The county's comprehensive plan and land use regulations were found to comply with Goal 5. The City of Umatilla's most recent periodic review order finds that the city's comprehensive plan and land use regulations comply with the Goal 5 rule requirements.

6. OAR 660, Division 18: "Plan and Land Use Regulation Amendment Review Rule"

This rule does not apply because the Project does not require amendment of the comprehensive plans or land use regulations of Umatilla County or the City of Umatilla.

7. OAR 660, Division 25:

This rule sets forth requirements for periodic review of comprehensive plans and land use regulations, and prohibits amendments to plan or regulation provisions currently subject to a work program. As no plan or regulation amendments are necessary for the Project, the rule does not apply.

8. OAR 660, Division 15: "Statewide Planning Goals and Guidelines"

The following Statewide Planning Goals may apply to the Project: (1) Goal 3 (Agricultural Lands); (2) Goal 5 (Open Spaces, Scenic and Historic Areas, and Natural Resources); (3) Goal 6 (Air, Water and Land Resources Quality); (4) Goal 9 (Economy of the State); (5) Goal 11 (Public Facilities); and (6) Goal 12 (Transportation).

Goal 3 (Agricultural Lands)

Goal 3 requires agricultural lands to be "preserved and maintained for farm use." "Farm use" is defined to include the non-farm uses authorized by ORS 215.213 and ORS 215.283. These non-farm uses include utility facilities, commercial utility facilities for generating power and transmission towers. At the same time, however, Goal 3 and ORS Chapter 215 require that non-farm uses be minimized and that they be compatible with agricultural uses.

Portions of the proposed transmission line and gas pipeline are on agricultural lands. These facilities have been sited to use existing utility and road corridors for most of their length. In addition, the gas pipeline will be buried, resulting in only a short-term impact on agricultural uses where the pipeline crosses lands in farm use. For these reasons, and the additional reasons identified below in connection with applicable comprehensive plan and land use regulations, the Project complies with Goal 3.

Goal 5 (Open Spaces, Scenic and Historic Areas, and Natural Resources)

Umatilla County and the City of Umatilla have inventoried open space, scenic and historic areas and significant natural areas within the impact area for the Project. Additional information on these resources is provided in the following Exhibits of this SCA: (1) Exhibit H (Wetlands; (2) Exhibit J (Protected Areas); (3) Exhibit M (DEQ Permits); (4) Exhibit N (Native Vegetation and Soil Cover); (5) Exhibit O (Water Resources); (6) Exhibit P (Fish and Wildlife); (7) Exhibit Q (Recreational Facilities and Opportunities); (8) Exhibit R (Threatened and Endangered Species); (9) Exhibit S (Visual Quality and Aesthetics); (10) Exhibit T (Historical, Cultural and Archaeological Resources; and (11) Exhibit W (Mitigation Plans).

There is no conflict between the Project and open space. The property containing the power plant has been planned for industrial use. The transmission line will upgrade an existing transmission line, and the gas pipeline will be buried.

Similarly, no conflicts with significant natural areas are anticipated. To the extent that pipeline or transmission line construction may involve impacts to wetlands or areas of important plant or animal habitat, the Project has been designed to avoid such conflicts to the

extent possible, and to mitigate conflicts where they are unavoidable (as described in Exhibit W).

As described in Exhibits M and O, the Project will utilize a portion of an existing water right held by the Port of Umatilla, and wastewater will be beneficially reused for irrigation. This element of the Project conserves scarce surface and ground water resources in the area.

As discussed in Exhibit T, no significant historic or cultural areas have been identified for the Project site. The applicant will continue to coordinate and consult with the Confederated Tribes of the Umatilla Indian Reservation to assure that no conflicts develop, or that if they do, appropriate remedial measures are taken.

For the foregoing reasons, and the additional reasons identified below in connection with the local government comprehensive plan and land use regulations, the Project complies with Goal 5.

Goal 6 (Air, Water and Land Resources Quality)

Goal 6 addresses waste and process discharges and their impacts on air, water and land. All waste and process discharges from the Project will comply with state and federal environmental quality statutes, as demonstrated in Exhibit M of this SCA. For these reasons, the Project complies with Goal 6.

Goal 9 (Economic Development)

Goal 9 is directed towards identifying areas suitable for increased economic growth and activity. The location of the energy facility for this Project has been inventoried and planned for industrial use by Umatilla County, is designated as an enterprise zone, and services for the site have been planned by the county and the Port of Umatilla. The Project is not located in an area designated as unsuitable by the EFSC, and for these reasons the Project complies with Goal 9.

Goal 11 (Public Facilities and Services)

Under Goal 11, facilities and services provided to rural areas should be suitable and appropriate solely for the needs of rural uses. As noted above, in connection with Goal 3, commercial utility facilities for generating power are a use that is allowed on rural lands. The public facilities and services for the Project include a water line connecting the Project with the Port of Umatilla's distribution system and limited police or other emergency services. No public road improvements are needed for the Project. Exhibit U discusses the availability and adequacy of the existing public facilities and services.

The facilities and services required by the Project are adequate and suitable for the Project, and do not encourage the extension of inappropriate services to other rural uses. The transmission and gas pipeline have been located to utilize existing rights-of-way and avoid dividing farm units. For these reasons, the Project complies with Goal 11.

Goal 12 (Transportation)

Goal 12 calls for lands adjacent to freeway interchanges to be managed and controlled so as to be consistent with the land use and development patterns identified in applicable local comprehensive plans. Umatilla County's comprehensive plan identifies the site of the energy facility as appropriate for industrial use. The Project will have peak employment of 25 persons, and will not significantly affect, or require any new, transportation facility. For these reasons, the Project complies with Goal 12.

LOCAL COMPREHENSIVE PLANS AND LAND USE REGULATIONS

The power plant and the gas pipeline are located entirely within Umatilla County's planning jurisdiction. The transmission corridor is also located primarily within the county, although a small portion of the corridor passes through the planning jurisdiction of the City of Umatilla. The locations of these three components of the Project are shown in Figures I-1 through I-4. The following sections describe the Project site and surrounding land uses, and then assess the Project's consistency with relevant county land use regulations and compliance with city ordinances.

Combustion Turbine Power Plant

The power plant is located on an undeveloped, industrially-zoned, 10-acre parcel in Umatilla County. It is adjacent to an existing industrial facility, the Lamb-Weston potato processing plant on the east and is bounded by the Lamb-Weston access road to the north, Westland Road to the west and the Union Pacific Railroad track to the south. It is otherwise in an area predominated by industrial and agricultural uses. The power plant is within an enterprise zone intended for future industrial development. It has a comprehensive plan designation of Industrial and a zoning designation of Light Industrial (LI). The LI zone permits utility facilities as a conditional use.

Land uses within a one-half mile radius of the power plant include the following:

- The Lamb-Weston potato processing facility, immediately east of the project site;
- A residence surrounded by trees and located approximately 500 feet north of the project site;
- Several mobile homes surrounded by trees about 1/4 mile south of the project site;
- A mobile home about 200 feet northeast of the Lamb- Weston facility and adjacent to the Umatilla River;
- Several residences about 1/4 to 1/2 mile northeast of the project site, and across the Umatilla River;
- The Northwest Livestock Commission about 2/3 mile southeast of the project site;
- A mobile home situated near the Northwest Livestock Commission property;

- The Umatilla-Morrow Growers Coop about 1/4 mile southwest of the site along Westland Road;
- An open field located west of Westland Road and across from the project site;
- Westland Furniture store and a mobile home about 1/4 mile north of the project site at the intersection of Westland Road and Walker Road; and
- The Umatilla Army Ordnance Depot west of I-82, about 3/4 of a mile from the project site.

Agricultural and agribusiness uses are the predominant land use beyond the one-half mile site radius.

Gas Pipeline

The natural gas pipeline corridor consists of a lateral connection approximately 4-1/2 miles long to the existing PGT natural gas pipeline, which brings natural gas from the Canadian province of Alberta. Beginning at the power plant, the pipeline route generally parallels County Road No. 1327 south for about 2 miles. It then continues south across lands principally in agricultural use. See Figure I-3.

The lateral pipeline will be underground. Construction of the pipeline will temporarily remove about 27 acres of land from agricultural use. Construction of the pipeline is expected to take 3 to 4 months. Once construction is completed, the pipeline will be covered and agricultural lands can be returned to production.

The entire lateral pipeline is within Umatilla County's jurisdiction. A small portion of the pipeline—closest to the plant—will be on land with a comprehensive plan designation of Industrial and zoned LI (Light Industrial). The remainder of the pipeline will be on land with a comprehensive plan designation of North and South County Agricultural and zoned EFU (Exclusive Farm Use).

Land uses within a one-half mile area of the pipeline corridor include agricultural and agribusiness uses.

Transmission Line

Electric power from the Project will be delivered to the regional power grid at BPA's McNary Substation at Umatilla. This will require upgrading approximately 12 miles of the existing UECA Westland-McNary transmission line from 115 kV to 230 kV. See Figure I-4. This upgrade will consist of replacing existing wooden pole structures with single-shaft steel poles. These poles will carry both the existing 115 kV and the new 230 kV circuits. The existing wood poles also support a 12.47 kV circuit. Approximately every other existing wood pole will be replaced with a steel pole. The remaining wood poles may be left in place to help support the 12.47 kV circuit. Depictions of typical steel pole designs under consideration are provided as Figures B-6. Steel poles will incorporate raptor-proof design features described in Exhibit P.

Upgrading of the transmission line will occur within the existing transmission right-of-way. Where the right-of-way crosses the Umatilla River, poles will be setback from the river as much as possible.

In addition, approximately 1/4 mile of new 230 kV transmission line will be required from the existing transmission line route to the McNary substation. This new section of transmission line will be of similar design to that of the upgraded portion of the line and is located on federally-owned lands.

Most of the existing transmission line and all of the new transmission line is within the jurisdiction of Umatilla County. From the power plant site, approximately the first mile of the transmission line is Zoned LI (Light Industrial), with a comprehensive plan designation of Industrial. The transmission line proceeds north along the boundary of the Umatilla Ordnance Depot. For 2-1/2 miles, the transmission line is on land zoned by the county EFU-40 (Exclusive Farm Use, 40-acre minimum) with a comprehensive plan designation of West County Irrigation Districts. The right-of-way continues north and east to the urban growth boundary (UGB) of the City of Umatilla on land zoned EFU (Exclusive Farm Use) with a comprehensive plan designation of North and South County Agricultural.

Land inside the UGB but outside the city (i.e., in the "urban growth area") is under county jurisdiction. However, under the "Urban Growth Area Joint Management Agreement" between the county and the City of Umatilla, the county has agreed to incorporate into the Umatilla County Comprehensive Plan that portion of the City of Umatilla Comprehensive Plan which addresses the urban growth area. Thus, in the urban growth area, county zoning designations apply, but the city's comprehensive plan designations apply.

Approximately 1/4 mile of existing right-of-way along Spud Road is within the urban growth area, and has county zoning of EFU and a city comprehensive plan designation of SR (suburban residential). The transmission line then enters the city limits, and passes through several zones. As discussed below, the city allows transmission lines as a conditional use under a "Community Service" designation which can be applied in any city zoning district.

After leaving the city, the remainder of the existing UECA transmission line right-of-way is within the urban growth area, and has county zoning of F1 (Exclusive Farm Use,19-acres), F2 (General Rural, 19-acres) and R1 (Agricultural-Residential, 4 acres). These zones predate the current County Development Ordinance, and are not part of that ordinance, but these zones are still in effect.

The portion of the transmission line requiring new right-of-way will be within the urban growth area, on land zoned F1, with city comprehensive plan designations of PF (Public Facilities) and R-O/S (Recreation-Open Space). The new transmission line will be located on federally-owned land.

Land uses within a one-half mile area of the transmission corridor include agriculture and agribusiness, the Umatilla Ordinance Depot, and urban and rural uses including residential, commercial and industrial uses.

COMPLIANCE WITH LOCAL LAND USE REGULATIONS

This section describes the land use regulations applicable to each part of the Project (the power plant, the gas pipeline and the transmission line) and describes how the Project is consistent with

the comprehensive plans and land use regulations of Umatilla County and complies with the ordinances of the City of Umatilla. Particular local approvals and permits necessary for the construction and/or operation of the Project will be required as a condition of the site certificate, including conditional use permits from Umatilla County for the power plant and from the City of Umatilla for the transmission line. Following issuance of the site certificate, the appropriate local approvals will be issued.

Umatilla County

Power Plant

This subsection describes how the proposed power plant is consistent with the applicable comprehensive plan policies and zoning regulations of Umatilla County. The gas pipeline and those portions of transmission line under Umatilla County's jurisdiction are addressed in the two subsections following this one.

As described above, the power plant is located in the county's LI zoning district. In addition, because portions of the related and supporting facilities (the gas pipeline and the electrical transmission line) also are located in the same LI zoning district, these aspects of the Project are also addressed here.

Applicable County Zoning Regulations

Conditional Use Criteria

Utility facilities are a conditional use in the county's Light Industrial (LI) zone. Umatilla County Development Ordinance (UCDO) Section 3.184(16). As a utility facility in the LI zone, the power plant is subject to two sets of conditional use criteria: the general criteria for conditional uses in the LI zone (UCDO Sections 3.185 and 7.050); and the more specific criteria for utility facilities as conditional uses (UCDO Section 7.060(55)).

The general criteria for conditional uses in the LI zone (UCDO Sections 3.185 and 7.050) are evaluated below. The applicable requirement is cited, after which the Project is evaluated against the requirement.

UCDO Section 3.185. "The following general criteria shall be used to review all conditional uses listed in the LI Zone, notwithstanding any other criteria listed in this Ordinance for a particular use:

"(1) The use will be compatible with other uses allowed in the LI Zone;

The LI zone permits industrial uses such as warehouses, manufacturing of processed materials, machine shops, bottling works, food processing facilities, nurseries and greenhouses, grain elevators, flour mills, and other uses. Conditional uses permitted include utility facilities, major manufacturing, junk yards, sand or gravel storage, wood processing facilities, gas stations, gravel extraction and processing facilities and other uses listed in Section 3.184 of the UCDO.

The power plant is located on a site that is presently undeveloped. It will introduce another industrial facility within an area that presently contains a potato processing plant, railroad tracks, warehouses, animal stockyards, agricultural activities, and several rural residences. Generally, the power plant will result in the intensification of industrial activity in an area that is designated for that use.

During construction, the Project will result in minor inconveniences caused by increases in noise, dust and traffic. However, these impacts are not considered significant (see Exhibit M for a discussion of air quality). During operation, the Project will not result in land use incompatibilities. It will not cause significant land use conflicts with nearby uses nor will it be adversely affected by the operations associated with these uses.

Once operational, the Project will be a low intensity use. It will employ about 25 workers over a 24-hour period with the greatest number of employees (15) working during the eight to five shift. The Project will not generate significant increases in noise, dust or vibrations that could adversely affect nearby land uses. The parking areas for the power plant will be paved so that dust will not be a concern. Access to the site will be via the existing Lamb-Weston access road which is in compliance with county standards. Project traffic will include employees (25 employees over 3 shifts) commuting to and from the site and infrequent deliveries to the Project.

"(2) The use will be in conformance with policies listed in the text of the Comprehensive Plan;

Conformity with comprehensive plan policies is addressed below.

"(3) The use would not have an adverse impact on existing industrial uses in that it would not be incompatible with the noise, dust, vibrations and odors that may emanate from or be caused by the existing adjacent industrial uses."

As discussed in connection with subsection (1), existing industrial uses in the area include a potato processing plant, railroad tracks, warehouses, and animal stockyards. The Project will serve as a source of process steam for the Lamb-Weston potato processing plant and is therefore supportive of one of the primary existing industrial uses in the area. The Project is not sensitive to existing levels

of noise, dust, vibrations and odors, and will not be constrained by existing conditions.

UCDO Section 7.050 provides the county's Hearing's Officer with general authority to impose conditions on conditional uses. Umatilla County has indicated that pursuant to this section it would like general landscaping for the entire energy facility site (not just the parking area). As stated below, a landscaping plan for the entire energy facility will be prepared and implemented.

In addition, Section 7.060(55) of the county's zoning code identifies specific conditional use criteria relevant to utility facilities. They include the following:

"(a) **The facility is designed to minimize conflicts with scenic values and adjacent recreational residential, forest, grazing and farm uses as outlined in policies of the Comprehensive Plan;**

Conformity with these comprehensive plan policies is addressed below. In addition, issues relating to scenic values are addressed in Exhibit S. Of the listed uses, only farm uses are in the proximity of the site. The power plant will not conflict with farm uses. The gas pipeline will only temporarily disturb farming during construction. Placement of the pipeline underground and use of the existing transmission line rights-of-way will minimize conflicts with farm uses.

"(b) **The facility be of a size and design to help reduce noise or other detrimental effects when located adjacent to recreational residential dwellings;**

There are no recreational residential dwellings adjacent to the power plant.

"(c) **The Hearings Officer may require that the facility be fenced and landscaped buffering and/or screening be provided;**

The power plant will be fenced and landscaped. A landscaping plan will be developed to include, as appropriate, a combination of native and ornamental plants. The landscaping plan will allow easy access to equipment, while partially screening the power plant and providing visual buffering.

"(d) The facility does not materially alter the stability of the overall land use pattern of the area;

The power plant is an industrial use in an area designated and developed for industrial uses. It will help assure the successful development of this area for industrial uses and, in particular, will be complementary with the Lamb-Weston potato processing plant as a source of process steam.

"(e) The facility does not constitute an unnecessary fire hazard, and consideration be made for minimum fire safety measures which can include but are not limited to:

"(A) The site be maintained free of litter and debris;

Litter and debris will be stored in on-site dumpsters, with periodic hauling via a private contractor to a properly licensed facility. Site maintenance will be performed on a regular basis to assure that the grounds are kept free of litter and debris.

"(B) Using non-combustible or fire retardant treated materials for structures and fencing;

As described in Exhibit B, the power plant will be constructed from fire retardant materials, and will incorporate a comprehensive on-site fire suppression system.

"(C) Clearing site of all combustible materials within thirty (30) feet of structures;

As part of the maintenance plan for the Project, clearing of combustible materials from the site at regular intervals will be required, including all areas within 30 feet of structures.

"(f) **Major transmission tower, poles and similar gear shall consider locations within or adjacent to existing rights-of-way in order to take the least amount of timberland out of production and maintain the overall stability and land use patterns of the area, and construction methods consider minimum soil disturbance to maintain water quality;**

The portion of the electrical transmission line within the LI zone will utilize an existing transmission right-of-way held by Umatilla Electric Cooperative. Only a very small portion of the natural gas lateral pipeline is within the LI zone. The pipeline will be buried, and will require a new right-of-way to connect with the PGT main line to the south. Beginning at the power plant site, the pipeline route generally parallels County Road No. 1327 south for about 2 miles.

"(g) **The facility shall adequately protect fish and wildlife resources by meeting minimum Oregon State Department of Forestry regulations;**

This criterion is applicable only to forest lands which are not included in this Project. Nevertheless, the Project is located approximately 1/4 mile west of the Umatilla River, and is well outside of both the flood plain and riparian zone of the river. No wildlife resources are inventoried in the area of the plant site. As a result, fish and wildlife resource will not be impacted by the power plant or by those portions of the electrical transmission line or natural gas line within the LI zone.

"(h) **Access roads or easements be improved to a standard and follow grades recommended by the Public Works Director;**

The power plant is located on a twenty-acre site, which is bounded on the north by the existing, fully-improved access road to Lamb-Weston's potato processing facility. The power plant is bounded on the west by Westland Road. Access to the site will be from Lamb-Weston's existing access road. From the power plant site, Interstate-84 can be accessed from Westland Road and Interstate-82 can be accessed from Lamb Road. The only access improvements that will be required are the on-site road system shown on Exhibit B. These roads will be constructed to county standards.

"(i) Road construction be consistent with the intent and purposes set forth in the Oregon Forest Practices Act or the 208 Water Quality Program to minimize soil disturbance and help maintain water quality;

A construction management plan to minimize erosion and maintain water quality is required in conjunction with the construction stormwater permit contained in Exhibit M. This plan will minimize soil disturbance and maintain water quality during road construction.

"(j) Land or construction clearing shall be kept to a minimum to minimize soil disturbances and help maintain water quality;

See immediately above.

"(k) Complies with other conditions deemed necessary by the Hearings Officer."

No other conditions on the construction or operation of the power plant have been identified as necessary by Umatilla County.

Other Standards.

Several other standards for uses in the LI zone apply to the proposed power plant and its related and supporting facilities. These include: (1) Limitations on Use (UCDO Section 3.186); (2) Design Review (UCDO Section 3.187); (3) Dimensional Standards (UCDO Section 3.188); and (4) Supplementary Regulations (UCDO Chapter 4). These regulations are discussed below.

Limitations on Use (UCDO Section 3.186). This code section contains two applicable requirements. The first is that all activities be conducted wholly within a building, or if not conducted in a building, that the activities be screened unless the activity is more than 500 feet from surrounding non-industrial uses or public roads. The second is that all noise, vibration, dust, odor, smoke, appearance or other objectionable factors involved in any activity shall comply with appropriate state and federal regulations. As described above and in Exhibit B, activities will be conducted within buildings with few exceptions. In addition, the power plant site will be landscaped to screen any exterior activities from view. The closest residential use is approximately 500 feet north of the plant site. As described in Exhibits M and CC, all applicable state and federal regulations will be met during operation of the facility.

Design Review (UCDO Section 3.187). This code section provides that the Planning Director may require landscaping around the building(s) or property line to insure conformance with county policies, and require compliance with parking, setback and vision clearance standards. Proposed landscaping for the Project is described above. The Project will include parking and access improvements in conformity with county requirements. Setbacks are described immediately below.

Dimensional Standards (UCDO Section 3.188). This section establishes standards for lot size, lot width, setbacks, and stream setbacks. The energy facility will be located on a lot containing ten acres, well above the minimum lot size. Minimum lot width is well above the 100 foot requirement. The following setbacks will be observed: front yard -- 20 feet; side yard --20 feet; rear yard -- 20 feet. Sewage disposal stream setbacks do not apply to this proposal as Lamb-Weston's existing sanitary system will be utilized.

Supplementary Regulations (UCDO Chapter 4). Chapter 4 of the UCDO contains supplementary regulations regarding signs, off-street parking and loading, access and vision clearance, fences and riparian areas. Any signs erected in connection with the proposed power plant will comply with the sign standards in UCDO Sections 4.010 to 4.040. Section 4.110 requires one parking space per employee and one additional space per 200 square feet of building space. This standard will be met or exceeded, as will the standards for off-street loading.

The access standards in UCDO Section 4.220 encourage shared access in industrial zones. The existing access road to the site will be shared with Lamb-Western, so that there is only one access point onto Westland Road. There is no other access onto Westland Road within 200 feet. In addition, the 15-foot vision clearance standard in UCDO Section 4.230(2) will be met.

Finally, any fences constructed in connection with the power plant will comply with applicable Uniform Building Code requirements and will be placed outside of vision clearance areas. No riparian vegetation is present at the site and UCDO Section 4.600 does not apply to this component of the Project.

Applicable County Comprehensive Plan Policies

The following Umatilla County Comprehensive Plan Policies are applicable to the proposed energy facility. The compliance of the Project with these policies is addressed below.

Economic Policies: The following economic policies are relevant to the proposed power plant:

1. **Encourage diversification within existing and potential resource-based industries.**

10. **Encourage industry and manufacturing diversification while preserving the more productive agricultural lands.**

The proposed power plant will add approximately 25 full-time, year-round jobs to the county's economy, helping to offset seasonal unemployment and underemployment. This will be done on non-agricultural lands. As a new source of employment in a sector that is not highly developed in the county, the proposed Project directly supports these policies.

7. Cooperate with development-oriented entities in promoting advantageous aspects of the area.

The Project links with and promotes the area's comparative advantages in availability of labor, reasonably priced land, access to energy sources, and excellent transportation access. It supports this policy.

8. Evaluate economic development proposals upon the following: will the proposal: (a) increase or decrease available [water] supplies; (b) improve or degrade [water] qualities; (c) balance [water] withdrawal with recharge rates; (d) be a beneficial use; (e) have sufficient quantities available to meet needs of the proposed project and other existing and reasonably anticipated needs; and (f) reduce other opportunities and, if so, will the loss be compensated by other equal opportunities?

This policy concerns the availability of water for future economic growth in the county. The proposed power plant is located within one of the Port of Umatilla's industrial areas, which the Port has applied for, and received a water right permit to allow for future industrial development. In other words, a supply of water for this project has already been set aside, and by helping to fund the delivery system needed to complete the water supply to this area of the county, the proposed power plant is supportive of this policy. Cooling water from the facility will be beneficially reused for irrigation, under a permit from the Oregon DEQ. The Project is supportive of this policy.

13. Provide for two types of industrial classification: light industry with less offensive odors and likely compatibility with commercial uses and heavy industry which may generate noise, offensive odors, vehicular traffic, or require large amounts of energy and require isolation from people-oriented land uses.

The proposed power plant is compatible with commercial uses. Noise and odors generated by the project are within applicable Oregon DEQ limits. Traffic generation, with 25 employees, is quite low and well within the capacity of surrounding streets. There is no health or safety reason to isolate the proposed facility and doing so would make the proposed co-generation of steam to supply Lamb-Weston difficult if not impossible.

Agriculture Policies: As noted above, the power plant is located outside of agriculturally designated areas, and is not on land currently in farm use (the gas pipeline and the transmission line are addressed in the subsections following this one). As a source of process steam to the Lamb-Weston potato processing plant, and as a source of irrigation water for Madison Ranches, the power plant is supportive of agricultural uses in Umatilla County and particularly Agriculture Goal 15, which calls on the county to support new surface water irrigation supplies. As a result, to the limited extent they apply to the power plant, the power plant is consistent with the policies.

Open Space, Scenic and Historic Areas, and Natural Resources Policies: There are no inventoried significant open space, scenic, historic, or natural resource areas in the vicinity of the power plant or that portion of the natural gas pipeline or electrical transmission line within the LI zoning district. The only inventoried site in the vicinity, the Westland School, burned down in the late 1980s. There is no wetland and/or riparian vegetation on site. Although there are no inventoried significant scenic sites or views in the area, Exhibit S contains a description of the scenic impacts of the Project, and proposed measures to mitigate for potential adverse visual impacts.

Policy 26 of the county's Open Space, Scenic and Historic Areas, and Natural Resources Comprehensive Plan element calls for the county to "cooperate with the [Umatilla] Tribe,

Oregon State Historic Preservation Office, and others involved in identifying and protecting Indian cultural areas and archeological sites." In accordance with this policy, the county has referred the SCA to the Confederated Tribes of the Umatilla Indian Reservation ("CTUIR") and the State Historic Preservation Office for further consultation, and the applicant will continue to consult with all of these entities.

CTUIR has pointed out that the Comprehensive Plan anticipates an on-going effort to identify and inventory cultural resources. Exhibit T to this SCA contains the results of the site surveys conducted for cultural and archeological resources at the location of the proposed energy facility. Additional consultation with the CTUIR will occur as the Project progresses.

Air, Land and Water Quality Policies: The following policies from Chapter IX of the County's Comprehensive Plan are relevant to the proposed power plant:

1. **Discharges from existing and future developments shall not exceed applicable federal and state environmental quality standards.**

7. **Consider cumulative noise impacts and compatibility of future developments, including the adoption of appropriate mitigating requirements of plan updates.**

The Project has been designed with the Best Available Control Technology to maintain air emissions within state and federal air quality standards as described in Exhibits B and M. Cooling water will be reused beneficially for irrigation on Madison Ranches, as described in Exhibits B and M, avoiding impacts to surface and groundwater, and reducing demands on limited water supplies. Impacts to fish and wildlife are assessed in detail in Exhibit P. The power plant is consistent with Policy 1.

The power plant will comply with state noise regulations. The surrounding land uses are predominantly industrial, commercial and agricultural, and are not noise sensitive as defined by DEQ rule. The power plant is consistent with Policy 7.

Natural Hazards Policies: The power plant is located outside of the designated floodway and floodplain boundaries of the Umatilla River. Seismic issues are addressed in Exhibit G, and the power plant's design takes into account potential earthquake hazards. As described above, the twenty-acre site is generally level, and has no slopes exceeding 25 percent.

Gas Pipeline

The entire natural gas pipeline is within the land use jurisdiction of Umatilla County. This subsection describes how the proposed natural gas pipeline, connecting the power plant with the PGT gas pipeline to the south, is consistent with the applicable comprehensive plan policies and zoning regulations of Umatilla County. As described above, the pipeline would temporarily remove about 27 acres of land from agricultural use. This land would be contained within approximately a 50 foot wide, four-mile long corridor. Construction of the pipeline is expected to occur over a 3 to 4 month time frame. Once installed, the pipeline will be covered, and soils replaced. The pipeline will be partially constructed along County Road 1237 and would not seriously interfere with farm operations and practices. Although it will temporarily affect a limited amount of agricultural lands, these lands will be returned to agricultural production upon completion of the pipeline construction. The Project will not permanently remove agricultural lands from production and the Project will be in conformance with the Comprehensive Plan.

Applicable County Zoning Regulations

Light Industrial Zone

As discussed above, the section of the gas pipeline closest to the plant site is on land zoned Light Industrial. The pipeline is a "utility facility," which is a conditional use in the LI zone. UCDO Section 3.184(16). This portion of the pipeline is included in the discussion above of the consistency of the plant site with the conditional use criteria of the County Development Ordinance.

Exclusive Farm Use (EFU) Zone

The county's EFU zone permits outright the "construction and maintenance of local feeder lines of utility companies and agencies." UCDO Section 3.011.4. The pipeline corridor for the Project consists only of a lateral to connect the plant site to the PGT line, much of which is along existing road right-of-way. Therefore, its construction is permitted outright in the county's EFU zone.

Applicable County Comprehensive Plan Policies

As a use allowed without review under the county's zoning code, the lateral natural gas pipeline is consistent with the county's Comprehensive Plan. While the county's Agriculture Policies (Nos. 9a and 9b) prohibit certain non-farm uses in particular areas and make others conditional uses, they do not regulate this use. The only agricultural policy with any relevance is Policy 8, which states that "the county shall require appropriate procedures/standards/policies be met in the Comprehensive Plan and Development Ordinance when reviewing non-farm uses for compatibility with agriculture." As noted above, the pipeline will largely utilize existing road right-of-way and will be buried, such that the only impacts to agriculture are during the three to four month construction period. These impacts, due to the limited area and timeframe, are not significant. The proposal is consistent with Policy 8.

Transmission Line

As described above, almost all of the required upgrading of the existing UECA transmission line will occur on lands under the land use jurisdiction of Umatilla County. The 1/4 mile of new transmission line is also within county jurisdiction. This subsection describes how the transmission line is consistent with applicable zoning regulations and comprehensive plan policies of Umatilla County. Compliance with the City of Umatilla's comprehensive plan and land use regulations is addressed in the next section of this Exhibit.

Applicable County Zoning Regulations

Light Industrial Zone

As discussed above, the section of the transmission line closest to the plant site is on land zoned Light Industrial. The transmission line is a "utility facility," which is a conditional use in the LI zone. Section 3.184(16). The transmission line is included in the discussion above of the energy facility.

EFU and EFU-40 Zones

The majority of the transmission line corridor is in the county's EFU and EFU-40 zones. The "maintenance and minor betterment of existing transmission lines and facilities of utility companies and agencies" is an outright permitted use in both of these zones. UCDO Sections 3.011.5 (EFU) and 3.051.5 (EFU-40). The proposed upgrading of the existing transmission line operated by UECA consists of the replacement of approximately every other existing wooden pole with single-shaft steel poles which will carry both existing 115 kV and 12.47 kV lines, and the new 230 kV lines. The remaining wood poles may be maintained to help support the existing 12.47 kV circuit. No new right-of-way is required in the EFU and EFU-40 zones. The upgrading of UECA's existing transmission lines within an existing right-of-way is "minor betterment of existing transmission lines and facilities" and is a permitted use in the EFU and EFU-40 zones.

F-1, F-2, and R-1 Zones

As discussed above, the transmission line passes through land within the City of Umatilla's urban growth boundary zoned by the county as F-1, F-2, and R-1. The one-quarter mile section of new transmission line is located entirely within the F-1 zone. These three zones are in effect only within the City of Umatilla's urban growth boundary.

A portion of the upgraded transmission line and all of the new transmission line is located on land zoned F-1. The F-1 zone is an exclusive farm use zone. Included among the permitted uses allowed outright within the F-1 zone are "utility facilities necessary for public service except

commercial facilities for the purpose of generating power for public use by sale." Section 3.012(5)(prior zoning ordinance). The transmission line is a utility facility necessary for public service, and does not generate power for public use by sale. Therefore, a zoning permit or land use approval is not required.

A "utility facility" is a conditional use in both the F-2 (general rural) and R-1 (agricultural/residential) zones. See Sections 3.024(14) and 3.072(6)(prior zoning ordinance). Therefore, the portion of the upgraded transmission line within the F-2 and R-1 zones must satisfy county conditional use criteria. The joint management agreement between the city and the county requires that the city's comprehensive plan be applied if the county's conditional use criteria require the application of comprehensive plan policies or goals.

Section 7.060(55) of the Umatilla County Zoning Ordinance identifies the conditional use criteria relevant to utility facilities. These are analyzed below:

> **"(a) The facility is designed to minimize conflicts with scenic values and adjacent recreational residential, forest, grazing and farm uses as outlined in policies of the Comprehensive Plan;**
>
> As discussed above, the policies of the City of Umatilla Comprehensive Plan apply within the urban growth boundary. There are no recreational residential or forest uses adjacent to the existing UECA powerline corridor. The city's Comprehensive Plan does not identify any scenic values associated with the relevant section of the power line. Some agricultural uses are located adjacent to the existing right-of-way. However, the location and design of the transmission line avoids any conflict with grazing and farm uses, and any unidentified scenic values, by utilizing the existing right-of-way and upgrading the existing facility operated by the Umatilla Electric Cooperative.
>
> **"(b) The facility be of a size and design to help reduce noise or other detrimental effects when located adjacent to recreational residential dwellings;**

The relevant portion of the transmission line is not located adjacent to recreational residential dwellings.

"(c) The Hearings Officer may require that the facility be fenced and landscaped buffering and/or screening be provided;

The transmission line will be suspended from steel poles, which have minimal visual impact at ground level. Thus, landscaping is not appropriate.

"(d) The facility does not materially alter the stability of the overall land use pattern of the area;

The Project will utilize an existing powerline right-of-way and will upgrade the existing poles from wood to steel. It does not introduce a new land use to the area, nor will it result in any significant secondary effect (noise, traffic, population growth, etc.) that could alter the stability of the land use pattern of the area.

"(e) The facility does not constitute an unnecessary fire hazard, and consideration be made for minimum fire safety measures which can include but are not limited to:

"(A) The site be maintained free of litter and debris;

The facility will be located in the existing Umatilla Electric Cooperative powerline right-of-way, which is maintained by the UECA. Applicant anticipates that UECA will continue to maintain the right-of-way, including removal of litter and debris, to minimize the fire hazard associated with the facility.

"(B) Using non-combustible or fire retardant treated materials for structures and fencing;

The upgraded transmission line will use steel poles, rather than the existing wooden poles.

"(C) Clearing site of all combustible materials within thirty (30) feet of structures;

See discussion above, under criterion (A).

"(f) Major transmission tower, poles and similar gear shall consider locations within or adjacent to existing rights-of-way in order to take the least amount of timberland out of production and maintain the overall stability and land use patterns of the area, and construction methods consider minimum soil disturbance to maintain water quality;

The relevant portion of the transmission line will utilize the existing transmission right-of-way held by UECA. Replacement of existing wooden poles with steel poles will require only temporary and very limited soil disturbance.

"(g) The facility shall adequately protect fish and wildlife resources by meeting minimum Oregon State Department of Forestry regulations;

This regulation applies only on forest lands. Nevertheless, where the transmission line crosses the Umatilla River, poles will be placed to avoid riparian habitat. As discussed in Exhibit P, upgrading the electrical transmission line will result, at most, in a temporary disturbance to ground-nesting birds and small mammals. Those impacts will be mitigated by scheduling construction outside the nesting season or developing other mitigation in coordination with the Oregon Department of Fish and Wildlife.

"(h) Access roads or easements be improved to a standard and follow grades recommended by the Public Works Director;

No access improvements will be required in conjunction with upgrading the transmission line.

"(i) Road construction be consistent with the intent and purposes set forth in the Oregon Forest Practices Act or the 208 Water Quality Program to minimize soil disturbance and help maintain water quality;

No road construction will be required in conjunction with upgrading the transmission line.

"(j) Land or construction clearing shall be kept to a minimum to minimize soil disturbances and help maintain water quality;

Soil disturbance will be minimal, given the single steel pole structure from which the transmission line will be suspended. Areas of soil disturbance will be small in dimension and separated from each other.

"(k) Complies with other conditions deemed necessary by the Hearings Officer."

No other conditions on upgrading the existing transmission line have been identified as necessary by Umatilla County.

City of Umatilla

This section addresses the relevant portion of the City of Umatilla's comprehensive plan and land use regulations.

Power Plant

The power plant is not located within the city's planning jurisdiction.

Gas Pipeline

The gas pipeline is not located within the city's planning jurisdiction.

Transmission Line

Applicable City Zoning Regulations

As indicated on Figure I-4, the existing UECA transmission line corridor passes through several zoning districts inside the city limits of the City of Umatilla. The city's zoning ordinance allows certain Community Service uses, "which, by reason of their public convenience, necessity, unusual character or effect on the neighborhood, may be appropriate in any district, but not suitable for listing within the other sections of this ordinance." Zoning Ordinance No. 554 (UZ0), Section 3.120. These community service uses are permitted throughout the city as conditional uses. "Community Service" uses include "[p]ower substation or other public utility building or use." UZ0 Section 3.121.

UZ0 Section 7.020(4) identifies the standards of approval for conditional uses, including Community Service uses, as follows:

> "For such facilities as a utility substation, water storage tank, radio or television transmitter, etc., the Planning Commission shall determine that the site is so located as to best serve the intended area with a minimum effect on surrounding property. Towers, tanks, poles, overhead wires, pumping stations and similar structures shall be located, designed and installed with suitable regard for aesthetic values."

The proposed transmission line upgrade complies with this standard. The upgrade will utilize an existing right-of-way within the city limits. It will replace approximately every other wooden pole that supports the existing 115 kV line and 12.47 kV line with steel poles that will support both the existing lines and the new 230 kV line. The remaining wood poles may be maintained to help support the existing 12.47 kV circuit. This minimizes the effect on surrounding property, as compared with establishing an additional right-of-way or duplicating facilities within or adjoining the existing right-of-way.

Similarly, upgrading existing facilities minimizes the aesthetic impacts of the 230 kV powerline. Use of steel poles will have little if any additional visual impact as compared to the existing wooden poles.

Applicable City Comprehensive Plan Goals and Policies

According to the city's Comprehensive Plan, the plan is not intended to deal with detailed site planning issues. (Comprehensive Plan, at 59.) The city's comprehensive plan is implemented, for purposes of reviewing specific development proposals, through the zoning code provisions addressed above. (Comprehensive Plan, at 57.) Nevertheless to assure a complete analysis of all possible issues, the following analysis addresses those Goals and Policies of the city's comprehensive plan that may be relevant to the Project.

Land Use Element: The following two policies may be relevant to the proposed transmission line:

> "Development proposals will be required to conform to the City's Zoning and Subdivision Ordinance."
>
> "The comprehensive plan will designate types of developable areas that will be derived from primary and secondary categories of development suitability." (Comprehensive Plan at 9.)

As addressed above, the upgrading of the UECA transmission line conforms to the city's Zoning Ordinance. No land division is required for the upgrade. The transmission line is located on lands designated as developable in the comprehensive plan.

Open Space, Scenic and Historic Areas, and Natural Resources Element: The comprehensive plan provides that: "the City will protect natural resource areas and require that the long-range availability and use of the following will not be limited or impaired by development: mineral and aggregate deposits, energy resources, domestic water supplies, fish and wildlife habitats,

ecologically and scientifically significant areas, agricultural land not needed for urbanization, and historically significant sites/areas." Comprehensive Plan at 10.

By utilizing the existing UECA transmission line right-of-way, the new transmission line will avoid any impacts on inventoried Goal 5 resources.

Development Hazards Element: This element of the city's comprehensive plan provides that the city will prohibit development in areas with natural limitations unless it is shown that design or engineering techniques can avoid adverse effects. Again, by utilizing existing right-of-way that is already developed for the same use, the transmission line will avoid development hazards.

Recreation Element: The Comprehensive Plan Recreation Element encourages pathways along utility easements. Upgrading of the transmission lines will not affect the suitability of the properties for any future recreational use.

Economics Element: This element of the comprehensive plan requires the city to coordinate with the Port of Umatilla and the State Department of Economic Development on local and regional economic development projects. Both entities are involved in the review of this Project through the normal EFSC coordination process and through the applicant's efforts.

Urban Facilities and Services: The upgrading of the UECA transmission line does not require any facilities or services, nor does it affect existing services.

In conclusion, although the city's comprehensive plan is implemented through its Zoning Ordinance for the purpose of development review not requiring a plan or zoning amendment, the transmission line upgrade complies with the Plan.

LAND USE IMPACTS WITHIN THE IMPACT AREA

Energy Facility

The energy facility site is shown on Figure I-2. As described above, the Project is within an existing industrial area designated for industrial use by Umatilla County. Based on the findings

in this Exhibit I, and the analyses of soils, water, resources, fish and wildlife, recreational facilities, threatened and endangered species, visual quality, cultural resources, and socioeconomic impacts, and noise (in Exhibits N, O, P, Q, R, S, T, U, & CC, respectively) the proposed energy facility will have no significant impact on land uses within the Impact Area.

Gas Pipeline Right-of-way

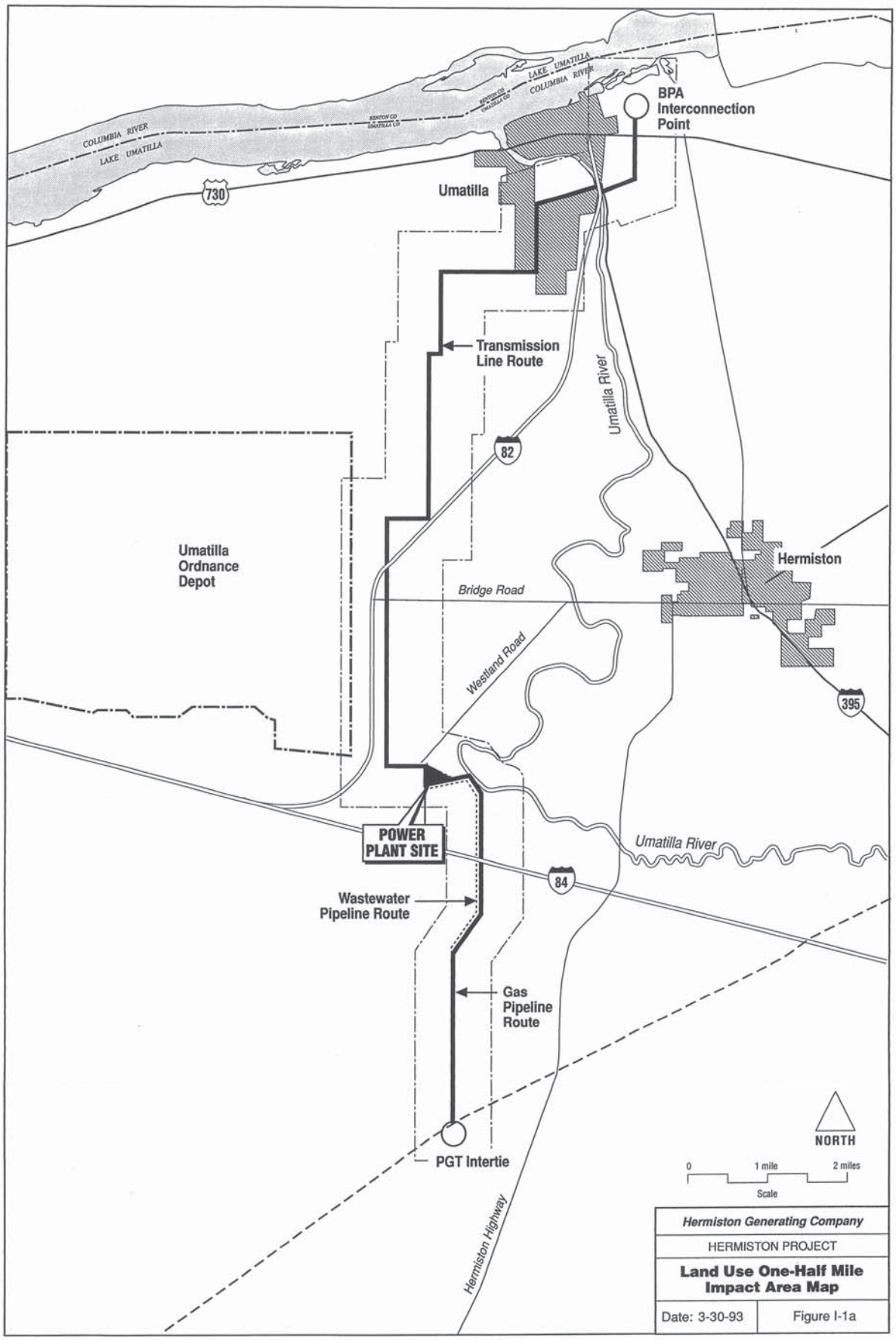
The gas pipeline right-of-way is shown on Figure I-3. As described above, the pipeline will be buried, and will follow an existing road right-of-way for part of its length. Such facilities are allowed outright by the county on agricultural lands, in recognition that any impacts are limited to the period of construction.

Transmission Line Right-of-way

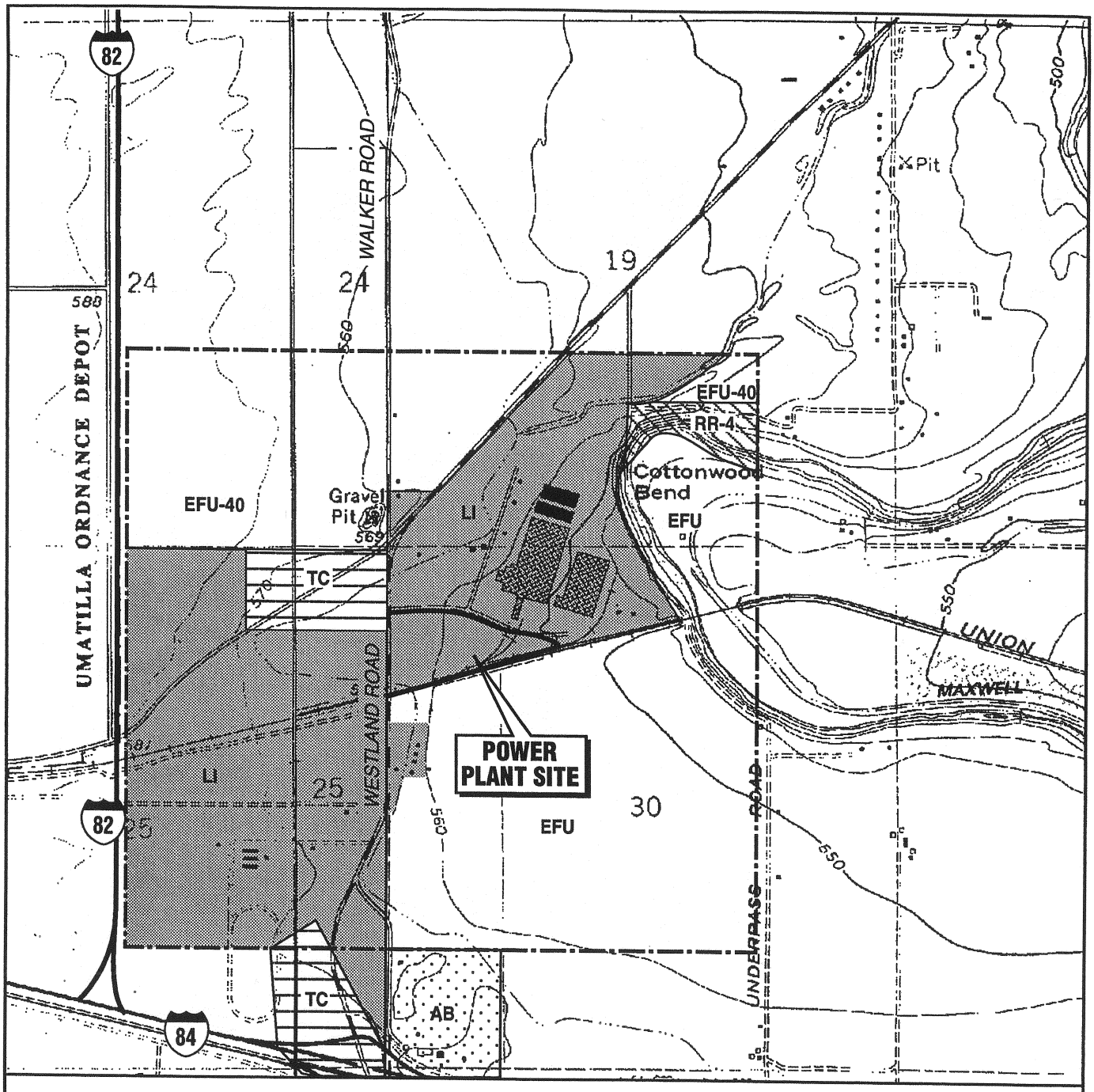
The transmission line right-of-way is shown on Figure I-4. As described above, the transmission line will consist almost entirely of the upgrade of existing UECA lines and, as a result, there will be no impacts on land uses. The one small section of new transmission line is sited in an area that already contains multiple transmission lines, adjacent to the McNary Substation.

FEDERAL LAND MANAGEMENT PLANS

Neither the energy facility nor the natural gas pipeline are located on lands under federal land use jurisdiction. The upgraded electrical transmission line crosses several small parcels under the control of the BPA and the Department of Interior (Bureau of Land Management and Reclamation). However there is no applicable federal land management plan for these properties. As a result, the proposed facility meets the requirements of OAR 345-21-015(1)(i) and OAR 345-22-030(2) with respect to federal lands.



92-4345b.002/rs/5
4-7-93



One-half Mile Impact Area Boundary

Umatilla County Zoning Designations

- LI – Light Industrial
- EFU – Exclusive Farm Use
- EFU-40 – 40 Acre Minimum
- EFU/FI – 19 Acre Minimum
- TC – Tourist Commercial
- AB – Agribusiness
- RR-4 – Rural Residential/ 4 Acre Minimum

Umatilla County Comprehensive Plan Land Use Designations

- Industrial
- Exclusive Farm Use
- Commercial
- Agribusiness
- Rural Residential

0 .5 mile
Scale

NORTH

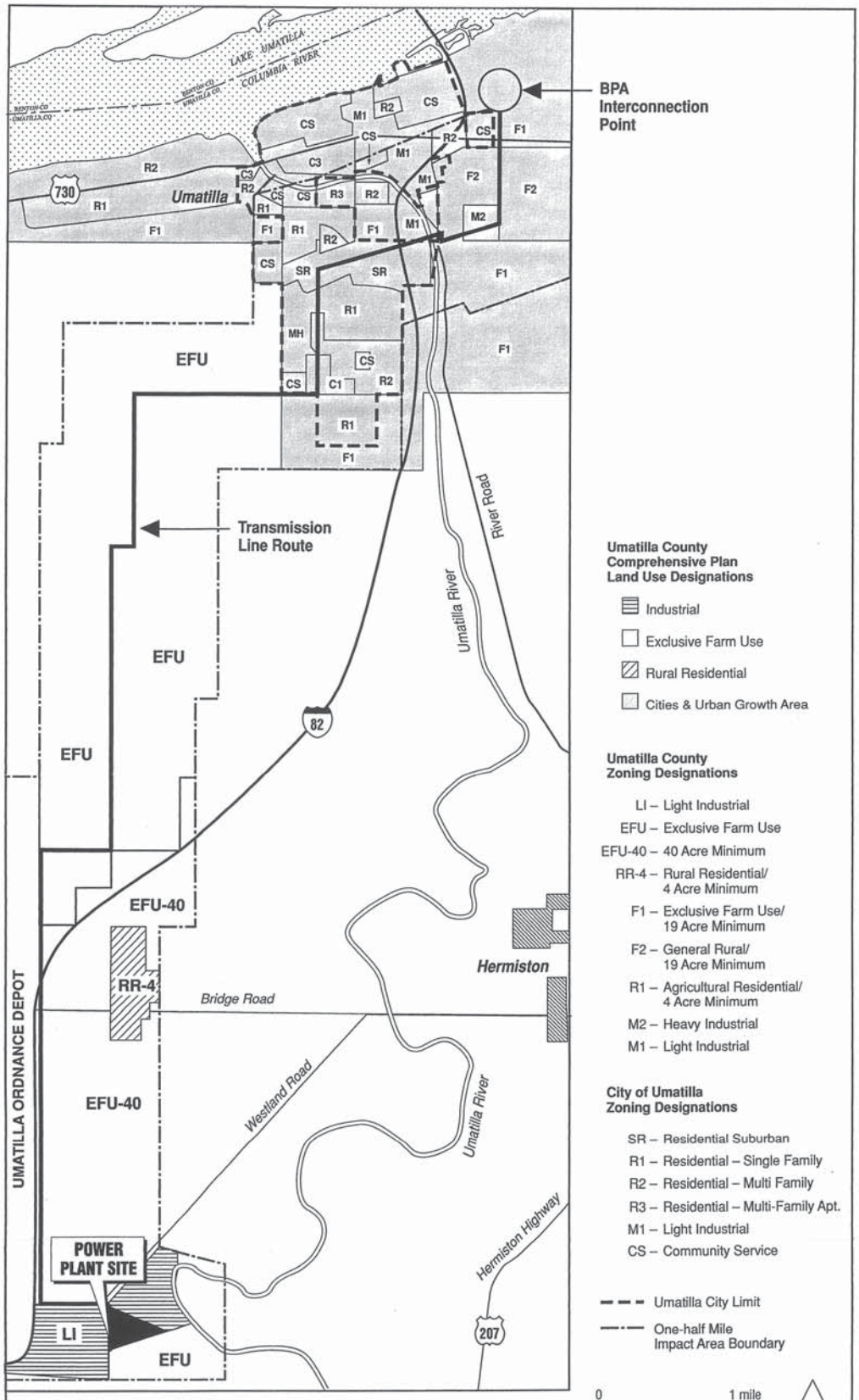
Hermiston Generating Company

HERMISTON PROJECT

Land Use Designation and Zoning – Energy Facility

Date: 3-29-93 | Figure I-2a

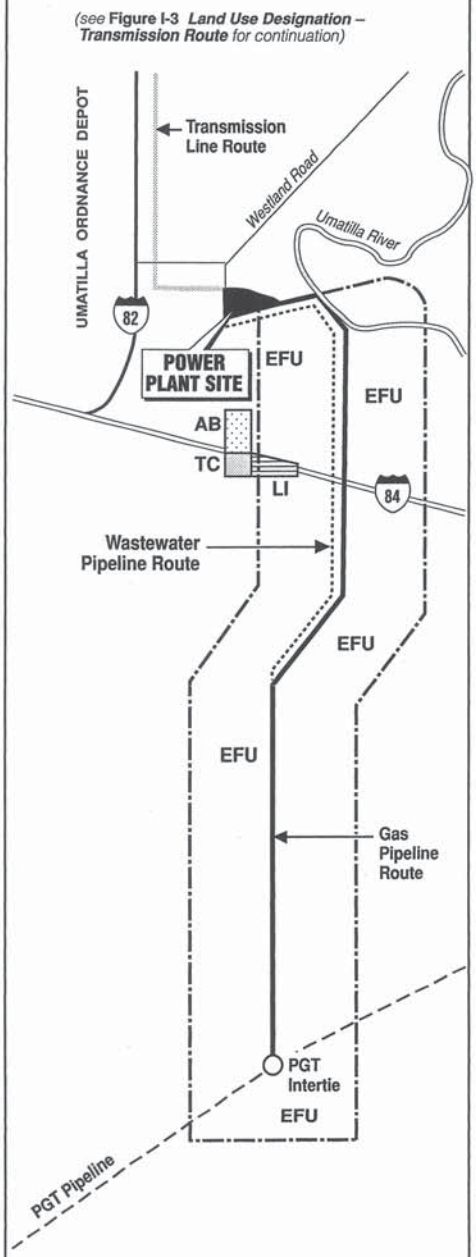
92-4345b.001
5-10-93 rs:5



(see **Figure I-3 Land Use Designation and Zoning – Gas Pipeline Route** for continuation)

Hermiston Generating Company
HERMISTON PROJECT
Land Use Designation and Zoning – Transmission
Date: 3-30-93 / Figure I-3a

93-4345b.003/rs/rs.8
5-10-93



Umatilla County Comprehensive Plan Land Use Designations

- Industrial
- Exclusive Farm Use
- Commercial
- Agribusiness

Umatilla County Zoning Designations

LI – Light Industrial
EFU – Exclusive Farm Use
TC – Tourist Commercial
AB – Agribusiness

0 — 1 mile
Scale

One-half Mile Impact Area Boundary

NORTH

Hermiston Generating Company

HERMISTON PROJECT

Land Use Designation and Zoning – Gas and Wastewater Pipeline Routes

Date: 3-30-93 | Figure I-4a

92-4345b.004/rs/5
4-8-93

URBAN GROWTH AREA JOINT MANAGEMENT AGREEMENT

City of Umatilla and Umatilla County, Oregon

The parties to this Joint Management Agreement shall be the City of Umatilla Oregon, and Umatilla County, Oregon.

The terms of this Joint Management Agreement shall be applicable to the City of Umatilla Urban Growth area. For the purposes of this Agreement the Urban Growth area shall be defined as that area of land extending from the Umatilla City Limits to the City of Umatilla Urban Growth Boundary as referenced and mapped in the City of Umatilla Comprehensive Plan on December 19, 1977 and made a part of this document (see Attachment A).

This Joint Management Agreement is entered into pursuant to ORS Chapters 190 and 197 and the Statewide Planning Goals for the purpose of facilitating the orderly transition from rural to urbanizable land uses within the City of Umatilla Urban Growth area.

Words and phrases used in this Joint Management Agreement shall be construed in accordance with ORS Chapters 92, 197, 215 and 227 and the applicable Statewide Planning Goals unless otherwise specified. In the event two or more definitions are provided for a single word or phrase, the most restrictive definition shall be utilized in construing this document.

I. Introductory Information

A. This Joint Management Agreement is the culmination of a series of actions intended, in part, to facilitate the orderly and efficient transition from urbanizable to urban land uses within the urban growth area. Such actions include the preparation of the comprehensive plan, a cooperately established urban growth boundary (see Attachments A-1, and D), coordination with affected governmental units, and county review of the comprehensive plan, including the urban growth boundary.

B. The Umatilla City Council has adopted by ordinance the City of Umatilla Comprehensive Plan, including the Urban Growth Boundary and Land Use Planning Goals, Objectives and Policies (see Attachment A-1).

C. The Umatilla County Board of Commissioners has amended the Umatilla County Comprehensive Plan by the adoption of the City of Umatilla Comprehensive Plan for land uses within the Urban Growth area (see Attachment A-1).

II. General Comprehensive Plan Provisions

A. Umatilla County shall retain responsibility for land use decisions and actions affecting the Urban Growth area. However, the Urban Growth area has been identified as urbanizable and is considered to be

II. A. Continued . . .

available over time for urban expansion. In order to promote consistency between the city planning effort and Umatilla County land use decisions and actions affecting the Urban Growth area it is agreed that Umatilla County shall incorporate that portion of the City of Umatilla Comprehensive Plan which addresses the Urban Growth area into the Umatilla County Comprehensive Plan.

B. After the City of Umatilla Comprehensive Plan has been reviewed and adopted by the Umatilla County Board of Commissioners, all public sector actions which fall within the scope of the City of Umatilla Comprehensive Plan shall be consistent with the Plan.

C. It is the policy of the City of Umatilla and Umatilla County to maintain a rapid exchange of information relating to their respective land use decisions within the City of Umatilla Urban Growth area.

III. Zoning and Subdivision

A. The substantive, as opposed to procedural, portions of the zoning and subdivision ordinances (see Attachments B-1 and B-2) shall be incorporated into and made a part of the Umatilla County Zoning and Subdivision Ordinances with exceptions as necessary and as agreed upon in writing by both parties to this Joint Managment Agreement no later than March 1, 1978. Such incorporated ordinances shall be applied only to zone change, conditional use, variance, subdivision, and major partition requests within the Urban Growth area.

B. Copies of each zone change, conditional use, variance, subdivision, and major partition request within the Urban Growth area received by Umatilla County shall be forwarded to the Umatilla City Planning Commission for its comment and recommendation. Such comment and recommendation shall be be submitted to the Umatilla County Planning Commission pursuant to Sections IV. A., V. A., and VI. A. below.

IV. Subdivision Applications

A. The Umatilla County Planning Department shall refer each subdivision application within the City of Umatilla Urban Growth area to the Umatilla City Planning Commission for its recommendation within ten (10) days of the date the application was filed. Such recommendation shall be submitted to the Umatilla County Planning Commission within thirty (30) days of the date the application was received by the Umatilla City Planning Commission.

B. The Umatilla County Planning Commission shall be responsible for all subdivision decisions within the City of Umatilla Urban Growth area, but such decisions shall be made only after the receipt of timely recommendations from the Umatilla City Planning Commission.

C. Should no response be forthcoming within established response times, absent a request for an extension, the City of Umatilla shall be presumed to have no comment regarding the issue.

V. Zone Change Applications

A. The Umatilla County Planning Department shall refer each zone change

V. A. Continued . . .

City Planning Commission for its recommendation within ten (10) days of the date the application was filed. Such recommendation shall be submitted to the Umatilla City Council for its review and recommendation within thirty (30) days of the date the application was received by the Umatilla City Planning Commission.

B. The Umatilla City Council shall review the Umatilla City Planning Commission recommendation and submit its own recommendation along with the Umatilla City Planning Commission recommendation to the Umatilla County Planning Commission within ten (10) days of the date the application was received by the Umatilla City Council.

C. The Umatilla County Planning Commission shall be responsible for all preliminary zone change decisions within the City of Umatilla Urban Growth area, but such decisions shall be made only after the receipt of timely recommendations from the Umatilla City Planning Commission and Umatilla City Council. The Umatilla County Planning Commission shall submit its preliminary decision along with the Umatilla City Planning Commission and Umatilla City Council recommendations to the Umatilla County Board of Commissioners within sixty (60) days of the date the application was received by the Umatilla County Planning Commission.

D. The Umatilla County Board of Commissioners shall retain final decision making responsibilities for zone changes within the City of Umatilla Urban Growth area, but such decisions shall be made only after the receipt of timely recommendations from the Umatilla City Planning Commission, Umatilla City Council, and Umatilla County Planning Commission.

E. Should no response be forthcoming within established response times, absent a request for an extension, the City of Umatilla shall be presumed to have no comment regarding the issue.

VI. Conditional Use, Variance, and Major Partition Applications

A. The Umatilla County Planning Department shall refer each conditional use, variance, and major partition applications within the City of Umatilla Urban Growth area to the Umatilla City Planning Commission for its recommendation within ten (10) days of the date the application was filed. Such recommendation shall be submitted to the Umatilla County Planning Commission within thirty (30) days of the date the application was received by the Umatilla City Planning Commission.

B. The Umatilla County Planning Commission shall be responsible for all conditional use, variance, and major partition decisions within the City of Umatilla Urban Growth area, but such decisions shall be made only after the receipt of timely recommendations from the Umatilla City Planning Commission.

C. Should no response be forthcoming within established response times, absent a request for an extension, the City of Umatilla shall be assumed to have no comment regarding the issue.

VII. City Services

A. The City of Umatilla may extend city services to any site within the City of Umatilla Urban Growth area at the affected property owner's expense. Such extension of city services to sites not contiguous to the City of Umatilla shall be conditioned upon an unlimited agreement signed by the affected property owner that the site may be annexed by City Council action as soon as the site becomes contiguous to the City of Umatilla.

B. For the purposes of this Joint Management Agreement, city services shall be limited to sewer and water.

C. For the purposes of this Joint Management Agreement, contiguous shall be defined as adjoining.

D. For the purposes of this Joint Management Agreement, expenses to be incurred by the affected property owner shall include the extension of service mains or lines from the city mains or lines, including tap-in costs, to the properties to be served.

E. Service and hook-up charges shall be as established by the Umatilla City Council.

VIII. Annexation

Annexation of sites within the City of Umatilla Urban Growth area shall be in accordance with relevant annexation procedures contained in the Oregon Revised Statutes, Oregon case law, and Umatilla City Ordinances and (see Attachments B-1 and B-2) shall not occur until such sites become contiguous to the City of Umatilla as required by the Oregon Revised Statues.

IX. Roads

Umatilla County and the City of Umatilla shall cooperatively develop an implementation policy regarding streets and roads within the urban growth area city limits which is consistent with the comprehensive plan. Such policy shall include, but not be limited to, the following:

A. The circumstances under which the City of Umatilla will assume ownership of and maintenance responsibility for county roads with the city limits.

B. The conditions under which new streets and roads will be developed in conjunction with subdivisions within the urban growth area.

C. The conditions under which new public streets and roads will be developed within the urban growth area.

D. The conditions under which existing roads designated as future arterials in the comprehensive plan will be improved.

E. See Attachments A-1 and C for existing county roads within the Umatilla city limits. (Attachment A-1 also displays roads within Urban Growth Area).

X. Appeals

A. As Umatilla County retains responsibility for land use decisions and actions affecting the urban growth area, appeals from such decisions and actions shall be in accordance with the appeals process specified in the Umatilla County Zoning or Subdivision Ordinances.

B. In the event that either the Umatilla County Planning Commission or the Umatilla County Board of Commissioners disagrees with the City of Umatilla comment and recommendation provided for in Section III. B. of this Joint Management Agreement, the City of Umatilla shall have standing to appeal as provided in Section X. A. above.

XI. Comprehensive Plan and Implementation Measure Review and Amendment

A. The comprehensive plan, including this Joint Management Agreement, and the zoning, subdivision, and other implementation ordinances or measures shall be reviewed at least annually to determine conformity with changes in:

1. The Oregon Revised Statutes;

2. Oregon case law;

3. Oregon Statewide Planning Goals;

4. Requirements of the City of Umatilla; and,

5. Requirements of residents of the City of Umatilla Urban Growth area.

B. If either the comprehensive plan or implementation measures or both fail to conform to any or all of the above-mentioned criteria, the nonconforming document shall be amended as soon as practicable. Such amendments shall be adopted:

1. By a majority of both the full City Council and the Umatilla County Board of Commissioners after recommendations have been received from the Planning Commissions of Umatilla County and the City of Umatilla, and,

2. In accordance with the Umatilla County Board of Commissioners Resolution and Order dated July 20, 1977, and entitled "In the matter of the Development and Adoption of Procedures and Standards for County Review of City Comprehensive Plans." (see Attachment E).

IN WITNESS WHEREOF, this Urban Growth Area Joint Management Agreement is signed and executed this 25th day of January, 1978.

UMATILLA COUNTY BOARD OF COMMISSIONERS

F. K. Starrett, Chairman

Ford Robertson, Vice-Chairman

Barbara Lynch, Commissioner

ATTEST: County Clerk

Jessie M. Bell

UMATILLA CITY COUNCIL

Al Draper, Mayor

Walt Stephenson

Cora Jean Cartwright

Sue Stamate

Tom Hyatt

Betty Stevens

May 22, 1987

CITY OF UMATILLA, OREGON

URGAN GROWTH AREA
JOINT MANAGEMENT AGREEMENT AMENDMENT

WHEREAS the City of Umatilla, Oregon, a municipal corporation, and Umatilla County, a political subdivision of the State of Oregon, entered into an Urban Growth Area Joint Management Agreement on July 20, 1977; and

WHEREAS Oregon State Law, specifically Oregon Administrative Rule 660-11-015(1) requires the Joint Management Agreement be amended to assign responsibility for preparation of the Public Facilities Plan; and

WHEREAS the City has, in fact, prepared the required Public Facilities Plan;

NOW, THEREFORE, said agreement is hereby amended to add Section XII, "Public Facilities Plan" which shall read as follows:

> The City of Umatilla shall be responsible for preparing a Public Facilities Plan for the City of Umatilla and its Urban Growth Boundary.

IN WITNESS THEREOF this amendment to the Urban Growth Area Joint Management Agreement is signed and executed this 16th day of June, 1987.

Attest: J. Dean Fouquette Sr.
Margaret McLaughlin, Deputy
County Clerk
cc - Ann Little

Exhibit I-3

NEIL GOLDSCHMIDT
GOVERNOR

Department of Land Conservation and Development

1175 COURT STREET NE, SALEM, OREGON 97310-0590 PHONE (503) 378-4926

January 8, 1988

The Honorable Allan J. Lambert
Mayor, City of Umatilla
P.O. Box 130
Umatilla, Oregon 97882

Dear Mayor Lambert:

I would like to congratulate you and other city officials and citizens of the City of Umatilla on completion of the periodic review process. Attached is the Director's report and an order which finds your submittal meets statutory and rule requirements for periodic review.

Again, you are to be commended for your work on periodic review. You will be notified soon concerning requirements for filing a codified version of your plan with our office. If you have further questions about this process or other requirements of the state land use program, please contact Brent Lake, your field representative, at 388-6424.

Sincerely,

James F. Ross
Director

JFR:DB/deb
<orders>

Enclosure

cc: Chairman Glenn Youngman, Board of Commissioners
County Planning Director
City Planning Director
LCDC
Brent Lake, Field Representative
Review Coordinator File
Portland PR File
Lead Reviewer File
Library File

BEFORE THE DIRECTOR OF THE
DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
OF THE STATE OF OREGON

IN THE MATTER OF THE PERIODIC REVIEW	)	
OF THE CITY OF UMATILLA'S	)	DIRECTOR'S TERMINATION
PLAN AND LAND USE REGULATIONS	)	ORDER 87-TERM-310

This matter came before the Director on January 8, 1988, as a final periodic review order pursuant to ORS 197.641 and the Commission Periodic Review Rule, OAR 660-19-000 to 660-19-110. The Director, having fully considered the City of Umatilla's final periodic review order, comprehensive plan and land use regulations, and comments and objections of interested parties, now enters these:

Findings of Fact and Conclusions

1. The attached written report of the Director of the Department of Land Conservation and Development constitutes the findings of fact related to the requirements of ORS 197.640 and OAR 660, Division 19.

2. Based on this review, the Director finds that the City of Umatilla's periodic review order and the comprehensive plan and land use regulations meet the requirements of the periodic review factors of ORS 197.640 for the reasons set forth in the Director's report dated January 8, 1988, which is made a part of this order (Exhibit A).

THEREFORE, IT IS HEREBY ORDERED THAT:

The Director of the Department of Land Conservation and Development terminates the City of Umatilla's periodic review.

Dated this 8th day of January 1988.

James F. Ross, Director
Department of Land
Conservation and Development

NOTICE: Objectors are entitled to review of this order by the Oregon Land Conservation and Development Commission. Commission review may be obtained by filing an appeal of the Director's action within 30 days from the mailing of this final order. Commission review is pursuant to the provisions of ORS 197.645 and 197.647.

** Copies of all exhibits are available for review at the Department's office in Salem.

JFR:DB/deb
<orders>

DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
PERIODIC REVIEW

City of Umatilla

DLCD PERIODIC REVIEW NOTICE DATE:
June 28, 1985

FINAL ORDER RECEIVED:
October 20, 1987

DATE OF REPORT:
January 8, 1988

I. ACTION OF THE DIRECTOR

Terminate the City of Umatilla periodic review on the basis that the city has satisfactorily addressed the periodic review factors of ORS 197.640(3) and OAR 660--Division 19, "Periodic Review."

Field Representative: Brent Lake
Phone: 388-6424

Lead Reviewer: Jim Hinman
Phone: 373-0088

City Contact: Dan Meader
Phone: 296-9177

II. BACKGROUND

Umatilla is a city of approximately 3,000 people, located in Umatilla County. The city's comprehensive plan was acknowledged on February 10, 1978. Amendments to the zoning ordinance, comprehensive plan, and inventory, and a final periodic review order were adopted as Ordinances No. 542 and 543 on September 21, 1987.

Objections

No objections to the order have been received by the Department.

III. FINDINGS

The city has made findings regarding the four periodic review factors under OAR 660-19-005. These are summarized below, along with the Department's evaluation.

FACTOR ONE

SUBSTANTIAL CHANGE IN CIRCUMSTANCES (OAR 660-19-055(2)(a))

Substantial change in circumstances is defined in OAR 660-19-055(2)(a) and -057 as follows:

A. Major developments or events which have occurred that the acknowledged plan did not assume or anticipate or major developments or events which have not occurred that the acknowledged plan did assume or anticipate;

B. Cumulative effects resulting from plan and land use regulation amendments and implementation actions on the acknowledged plan's factual base, map designations, and policies which relate to statewide goal requirements;

C. Oversight or a decision by the local government to delay or not carry out plan policies which relate to a statewide goal requirement; or

D. Incorporation into the plan of new inventory material which relates to a statewide goal made available to the jurisdiction after acknowledgment.

In addition to the four factors listed above, OAR 660-19-055(4) states that:

E. "Nothing in subsections (1)(a-e) of this rule is meant to limit or prevent any person from raising other issues or objections involving the 'substantial change in circumstances' factor set forth in OAR 660-19-057 as long as

II. BACKGROUND

Umatilla is a city of approximately 3,000 people, located in Umatilla County. The city's comprehensive plan was acknowledged on February 10, 1978. Amendments to the zoning ordinance, comprehensive plan, and inventory, and a final periodic review order were adopted as Ordinances No. 542 and 543 on September 21, 1987.

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No objections to the order have been received by the Department.

III. FINDINGS

The city has made findings regarding the four periodic review factors under OAR 660-19-005. These are summarized below, along with the Department's evaluation.

FACTOR ONE

SUBSTANTIAL CHANGE IN CIRCUMSTANCES (OAR 660-19-055(2)(a))

Substantial change in circumstances is defined in OAR 660-19-055(2)(a) and -057 as follows:

A. Major developments or events which have occurred that the acknowledged plan did not assume or anticipate or major developments or events which have not occurred that the acknowledged plan did assume or anticipate;

B. Cumulative effects resulting from plan and land use regulation amendments and implementation actions on the acknowledged plan's factual base, map designations, and policies which relate to statewide goal requirements;

C. Oversight or a decision by the local government to delay or not carry out plan policies which relate to a statewide goal requirement; or

D. Incorporation into the plan of new inventory material which relates to a statewide goal made available to the jurisdiction after acknowledgment.

In addition to the four factors listed above, OAR 660-19-055(4) states that:

E. "Nothing in subsections (1)(a-e) of this rule is meant to limit or prevent any person from raising other issues or objections involving the 'substantial change in circumstances' factor set forth in OAR 660-19-057 as long as

such concerns are submitted consistent with the requirements of OAR 660-19-080."

Subfactor A: Major Unanticipated Developments or Events (OAR 660-19-057(1)(a))

Requirement

The city must address major developments or events which have occurred that the acknowledged plan did not assume or anticipate or major developments or events which have not occurred that the acknowledged plan did assume or anticipate.

The Department's periodic review notice requested that the city address the impact of the new winery in Washington state immediately north of Umatilla and the anticipated development of Pebble Springs power plant and a second power house at McNary Dam which did not occur.

Response

The winery in Washington state is 14 miles away and has had no effect on the city. The fact that the major power facilities were not built as well as the general economic conditions in the region have resulted in a lower growth rate than expected. The city has, however, experienced a net population increase since 1975. The city expects that in the long term, the population projections in the plan will be realized (Final Order, p. 3,4).

Conclusion

The city satisfies this requirement. The city has addressed the concerns listed in the Department's notice. Based upon the city's data, the city's population has grown 35% since 1975. The recent slowdown in growth has not been long enough to demonstrate that a substantial change in circumstances has occurred.

Subfactor B: Cumulative Effects of Plan Amendments and Implementation Actions (OAR 660-19-057(1)(b))

Requirement

The city must address cumulative effects resulting from plan and land use regulation amendments and implementation actions on the acknowledged plan's factual base, map designations, and policies which relate to statewide goal requirements.

Response

The city states that there have been no major amendments to the plan or implementing measures since acknowledgment. The city has reviewed the residential and commercial building permits issued

over the past six years and finds very little residential and commercial land has been committed to development. The city finds that there are no significant cumulative effects which need to be addressed.

Conclusion

The city satisfies this requirement. The city has reviewed the amendments and implementing actions which have occurred since acknowledgment and has found no cumulative effects that need to be addressed.

Subfactor C: Plan Policies Related to Goal Requirements Which Have Not Yet Been Carried Out (OAR 660-19-057(1)(c))

Requirement

The city must address oversights or decisions to delay or not carry out plan policies which relate to a statewide goal requirement.

Response

The city finds that this requirement is not applicable.

Conclusion

The city satisfies this requirement. Neither the city nor the Department have found any policies which are applicable under this requirement.

Subfactor D: Availability of New Inventory Information (OAR 660-19-057(1)(d))

Requirement

The city must incorporate into the plan new inventory material relating to a statewide goal which was made available to the city after acknowledgment.

The city's periodic review notice listed the following inventories to be addressed: 1983 State Comprehensive Outdoor Recreation Plan (SCORP), state parks plans and inventories, airport updates, highway plans and Six-Year Improvement Plan (ODOT); Atlas of Oregon Lakes, air quality reports, water quality reports, hazardous waste sites, and aquifers with sensitive areas (DEQ); critical groundwater studies and basin programs (DWR); and annual population estimates (PSU).

over the past six years and finds very little residential and commercial land has been committed to development. The city finds that there are no significant cumulative effects which need to be addressed.

Conclusion

The city satisfies this requirement. The city has reviewed the amendments and implementing actions which have occurred since acknowledgment and has found no cumulative effects that need to be addressed.

Subfactor C: Plan Policies Related to Goal Requirements Which Have Not Yet Been Carried Out (OAR 660-19-057(1)(c))

Requirement

The city must address oversights or decisions to delay or not carry out plan policies which relate to a statewide goal requirement.

Response

The city finds that this requirement is not applicable.

Conclusion

The city satisfies this requirement. Neither the city nor the Department have found any policies which are applicable under this requirement.

Subfactor D: Availability of New Inventory Information (OAR 660-19-057(1)(d))

Requirement

The city must incorporate into the plan new inventory material relating to a statewide goal which was made available to the city after acknowledgment.

The city's periodic review notice listed the following inventories to be addressed: 1983 State Comprehensive Outdoor Recreation Plan (SCORP), state parks plans and inventories, airport updates, highway plans and Six-Year Improvement Plan (ODOT); Atlas of Oregon Lakes, air quality reports, water quality reports, hazardous waste sites, and aquifers with sensitive areas (DEQ); critical groundwater studies and basin programs (DWR); and annual population estimates (PSU).

Response

The city has reviewed all inventories listed in the DLCD periodic review notice and finds that this information applies to the plan as described below (Final Order, pp. 5-8). No other relevant inventory information is known to be available.

1) Department of Transportation (ODOT)

a) Statewide Comprehensive Outdoor Recreation Plan (SCORP): The 1983 SCORP contains no new information. A recreational needs assessment is already included in the city's comprehensive plan (p. 33).

b) State parks inventory updates: There are no state parks in Umatilla.

c) Airport inventory updates: There are no airports in the vicinity.

d) Highway inventory updates and Six-Year Highway Improvement Program: The city has addressed major additions to ODOT's highway program in its public facilities plan.

2) Department of Environmental Quality (DEQ)

a) 1985 Atlas of Oregon Lakes: There are no lakes in the city.

b) Annual Air Quality Reports: There are no known air quality problems in Umatilla.

c) Semi-Annual Water Quality Assessment Reports: This inventory is not applicable to the city.

d) EPA 1985 Hazardous Waste Disposal Sites Inventory: This inventory is not applicable to the city.

e) 1980 Major Water Table Aquifers with Sensitive Areas: This inventory is not applicable to the city.

3) Department of Water Resources (DWR)

Critical Groundwater Studies: The Department of Water Resources was contacted and no additional recommendations were received.

4) Portland State University (PSU)

Annual Population Estimates: The city has experienced a decline in population in the short run. However, it is

anticipated that the long range projection is accurate and the city will experience the growth projected over the planning period.

Conclusion

The city satisfies this requirement. The city has addressed applicable inventory information.

Subfactor E: Other Issues Involving a Substantial Change in Circumstances (OAR 660-19-057(2))

Requirement

"Nothing in subsections (1) (a-e) is meant to limit or prevent any person from raising other issues or objections involving the 'substantial change in circumstances' factor set forth in OAR 660-19-057 as long as such concerns are submitted consistent with the requirements of OAR 660-19-080."

Note: The city has addressed statutory changes which were adopted after the city's acknowledgment under Factor Two.

Response

The city did not respond to this requirement.

Conclusion

This requirement is not applicable. No "other issues" have been raised by any person. Statutory changes are addressed under Factor Two.

CONCLUSION FACTOR ONE

The city has satisfied all of the requirements of Factor One.

FACTOR TWO

NEW OR AMENDED GOALS OR RULES ADOPTED SINCE THE DATE OF ACKNOWLEDGMENT (OAR 660-19-055(2)(b))

Requirement

Under this factor, the city must address the following statewide planning goals and administrative rules which were amended after the city's acknowledgment.

anticipated that the long range projection is accurate and the city will experience the growth projected over the planning period.

Conclusion

The city satisfies this requirement. The city has addressed applicable inventory information.

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Requirement

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Note: The city has addressed statutory changes which were adopted after the city's acknowledgment under Factor Two.

Response

The city did not respond to this requirement.

Conclusion

This requirement is not applicable. No "other issues" have been raised by any person. Statutory changes are addressed under Factor Two.

CONCLUSION FACTOR ONE

The city has satisfied all of the requirements of Factor One.

FACTOR TWO

NEW OR AMENDED GOALS OR RULES ADOPTED SINCE THE DATE OF ACKNOWLEDGMENT (OAR 660-19-055(2)(b))

Requirement

Under this factor, the city must address the following statewide planning goals and administrative rules which were amended after the city's acknowledgment.

RULES	EFFECTIVE DATE
Goal 2 Land Use Planning Rule 660-04-000 (Exceptions) As Amended	07/21/82 12/20/83
Goal 5 Open Space/Natural Resource Rule 660-16-000	06/29/81
Goal 10 Housing Rule 660-08-000	07/21/82
Goal 11 Public Facilities Rule 660-11-000	At First Periodic Review

GOALS	EFFECTIVE DATE
Goal 2 Land Use Planning Amendments (Exceptions)	12/30/83

Requirement--OAR 660-04-000, Goal 2

The city must comply with the requirements of the Goal 2 rule (OAR 660--Division 4) and Goal 2, which were amended after the city's acknowledgment.

Response

The city has taken no exceptions. The city's plan contains no conflicting information concerning the exceptions process (Final Order, p. 10).

Conclusion

This requirement is not applicable to the city's periodic review.

Requirement--OAR 660-16-000, The Goal 5 Rule

The city must comply with the Goal 5 rule (OAR 660--Division 16) which was adopted after the city's acknowledgment.
OAR 660--Division 16 requires a detailed inventory of Goal 5 resources, and describes a process for evaluating the economic, social, environmental, and energy (ESEE) consequences of conflicting uses.

The Goal 5 rule addresses the following resources:

a. Land needed or desirable for open space;

b. Mineral and aggregate resources;

c. Energy sources;

d. Fish and Wildlife areas and habitats;

e. Ecologically and scientifically significant natural areas, including desert areas;

f. Outstanding scenic views and sites;

g. Water areas, wetlands, watersheds, and groundwater resources;

h. Wilderness areas;

i. Historic areas, sites, structures, and objects;

j. Cultural areas;

k. Potential and approved Oregon recreation trails;

l. Potential and approved federal wild and scenic waterways and state scenic waterways.

The Goal 5 rule requires the following for each of the above resources:

1. An inventory of the quality, quantity, and location of the resources, if available;

2. A determination of potential uses of the resource property or surrounding properties which may conflict with the resource;

3. An analysis of the environmental, social, economic, and energy consequences of allowing conflicting uses;

4. Decisions, including plan policies, which describe the city's action regarding the resources and potential conflicting uses; and

5. Implementing ordinances, including zoning which carry out these decisions and resolve conflicts.

Response

The city's response to the Goal 5 rule is described on pages 11 through 15 of the final order. The city's Goal 5 element, as amended, is summarized below by the Department:

a. Open Space: The city has inventoried recreation and open space needs and has designated these areas on the comprehensive plan map (plan, Figure 5). These areas include the banks of the Umatilla River, the Columbia River, several city parks, and a golf course. These areas are protected through federal ownership (Army Corps of Engineers), floodplain zoning, and a "Community Service" zone. The city's floodplain zone limits uses primarily to open space uses. The golf course and parks are zoned "Community Service."

e. Ecologically and scientifically significant natural areas, including desert areas;

f. Outstanding scenic views and sites;

g. Water areas, wetlands, watersheds, and groundwater resources;

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b. Mineral and aggregate resources: There are five sites within the city's urban growth boundary. The county's plan designates these sites "not significant." However, these sites are either in use now or have been in the past. The city needs to complete the Goal 5 analysis to determine which of these sites will be needed in the future. Those sites which are significant need to be protected from encroachment by conflicting uses such as rural residential development. The county needs to apply its gravel resource zone to those sites which are found to be significant. The city has designated the sites "1B" and adopted a policy to reexamine these sites in cooperation with the county by September 1, 1988 (Final Order, p. 11).

c. Energy sources: The only energy source within the urban growth boundary is McNary Dam. The dam is operated and protected by the federal government and no action is needed by the city (Final Order, p. 12).

d. Fish and wildlife areas and habitats: The Columbia and Umatilla river banks are fish and wildlife habitat. The city has attached a Goal 5 worksheet for these areas and has designated them as open space in the plan (Figure 5). The comprehensive plan contains a policy to protect fish and wildlife habitat (Plan, p. 10). The Columbia River banks are owned by the Army Corps of Engineers. These areas are within the city's floodplain zoning district. The city has amended the floodplain district (Section 3.100) to include a standard requiring protection of wildlife habitat. The uses allowed within the zone do not conflict with wildlife habitat (Final Order, p. 13).

e. Ecologically and scientifically significant natural areas: No such areas are identified (Final Order, p. 13).

f. Outstanding scenic views and sites: The Umatilla and Columbia rivers are identified as scenic areas (Final Order, p. 13). The protection mechanisms are the same as are discussed under open space, above.

g. Water areas, wetlands, watersheds, and groundwater resources: Water areas or wetlands associated with the Columbia and Umatilla rivers are already protected as open space as discussed above. No other areas are identified. Ground water resources are inventoried on page 29 of the comprehensive plan. The city protects groundwater resources by requiring development to connect to the city's water and sewer systems (Final Order, p. 14).

h. Wilderness areas: There are no wilderness areas in or near the city (Final Order, p. 14).

i. Historic areas, sites, structures, and objects: The city has identified and completed Goal 5 worksheets for two

archeological sites. No program for protection by the city is required because the sites are located on federal land (Final Order, p. 14). The city has adopted a policy to support the federal government's efforts to protect these sites (Ordinance No. 544). There are no other historic sites or structures within the city.

j. Cultural areas: (See Historic Areas, above.)

k. Potential and approved Oregon recreation trails: There are no potential or approved outdoor recreation trails in the city (Final Order, p. 15).

l. Potential and approved federal wild and scenic waterways and state scenic waterways: There are none of these resources within the planning area (Final Order, p. 15)

Conclusion

The city satisfies this requirement. The city has identified and protected applicable Goal 5 resources, except for the five aggregate sites discussed above. The city has classified the five sites "1B" (not enough information) and has adopted a policy to address these sites by September 1, 1988.

Requirement--OAR 660-08-000, The Goal 10 Rule

The city must comply with the Goal 10 rule which incorporates applicable provisions of ORS 197.295-313.

Needed Housing:

Needed housing as applied to Umatilla means housing types determined to meet the price range for housing within an urban growth boundary at particular price ranges and rent levels and includes attached and detached single family housing, multiple family housing for both owner and renter occupancy, manufactured housing, and government assisted housing. The mix and density of needed housing is determined in the housing needs projection (OAR 660-08-010).

Clear and Objective Approval Standards:

Standards for needed housing "must be clear and objective and must not have the effect, either individually or cumulatively, of discouraging needed housing through unreasonable cost or delay" (OAR 660-08-015).

Plan Designations:

The plan must either contain specific residential plan designations to accommodate the identified housing needs or defer assignment of plan designations based on conditions set forth in the rule (OAR 660-08-020).

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Rezoning to Maximum Density:

If land within the urban growth boundary is not zoned to the maximum planned residential density, a process for rezoning must be established; standards for rezoning must be clear and objective (OAR 660-08-025).

Regional Coordination:

Housing needs must be coordinated on a regional basis and each local community must accommodate a fair share allocation of housing types and densities (OAR 660-08-030).

Tenure:

A local government which restricts rental or owner occupied housing must project housing need according to tenure (OAR 660-08-040).

Response

Needed Housing:

The city has updated its buildable lands inventory and housing mix assumptions. The city does not regulate by tenure of occupancy and does not restrict government assisted housing. The city finds that an adequate amount of land is available to meet projected needs (Final Order, p. 16-22):

Housing Mix Assumptions

Single family dwellings	48%
Mobile homes	23%
Multi-family	29%

Housing Needs

Housing Type	Unit
Single Family	1,315
Mobile Homes	630
Multi-family	794

Vacant Land

Zone	Acres
R-1	226
R-2	49
R-3	23
M-H	109

Clear and Objective Standards:

The city's zoning ordinance (No. 412) allows multi-family and manufactured housing as outright uses in the "R-3" and "M-H" zones. The zoning ordinance provides clear and objective standards for all housing types (Final Order, p. 23).

Plan and Zoning Designations:

The city's plan map (Figure 5) designates land for single family, multi-family and mobile home developments.

Rezoning to Maximum Density:

All land within the city is zoned to maximum density (see zoning map). Land within the urban growth boundary will be zoned according to the plan designations upon annexation to the city.

Regional Coordination:

The city has provided an adequate amount of land to meet its housing needs and therefore will not impact other jurisdictions in the region through expansive or restrictive housingi policies.

Tenure:

The city has amended its zoning ordinance to remove restrictions on renter-occupied mobile homes (Section 7.050). The city no longer regulates housing tenure (Final Order, p. 24).

Conclusion

The city satisfies this requirement.

Requirement--OAR 660-11-000, Public Facilities Planning Rule

The city must comply with the Public Facilities Planning Rule (OAR 660--Division 07) which was adopted after the city's acknowledgment. OAR 660--Division 11 requires jurisdictions within urban growth boundaries of 2,500 or more population to

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plan water, sanitary sewer, storm drainage, and transportation projects to support the land uses designated in the comprehensive plan.

Response

The city has adopted a public facilities plan (Ordinance No. 542, Exhibit 1). The city has amended its "Urban Growth Area Joint Management Agreement" with Umatilla County to state that the city "shall be responsible for preparing a Public Facilities Plan for the City of Umatilla and its Urban Growth Boundary" (Signed by the county, June 16, 1987).

The public facilities rule requires that the following be adopted as a part of the comprehensive plan:

- a list of project titles,
- a map or written description of the project's location, and
- policies designating the provider of each facility system or project, as applicable.

For purposes of analysis, the city is divided into six subareas. The plan describes development trends and services within these areas (pp. 2-7). Because of the severe decline in economic growth in the region, the city expects little or no population growth in the short term. Therefore, in the short term, the city is focusing on daily maintenance and minor improvements (p. 6).

The public facilities plan includes a project list which is supported by a set of project maps and designates the provider of each project (Exhibits 2-6). The project list includes only long range projects, with the exception of several State highway projects which are scheduled for construction in 1987. Water, sanitary sewer, and transportation projects are included on the project list. The city does not have and does not require a central storm sewer system (p. 11).

The remaining items of information required by the rule (OAR 660-11-010) are an inventory and general assessment of the condition of each public facility system, rough cost estimates, project timing, and a discussion of funding mechanisms and their ability to fund projects in the plan. The inventory and assessment (pp. 8-10) summarizes information from the city's comprehensive plan, Sanitary Sewer Facilities Plan, and Water System Study. Information on cost, timing, and funding mechanisms is included with the project list (Exhibit 6).

Conclusion

The city satisfies this requirement. The emphasis on long range projects is consistent with recent low rates of growth in the

area. The city's public facilities plan contains a project list and the other items of information required by the rule. The city has coordinated its planning with Umatilla County.

Requirement

Under this factor, the city has addressed the following statutory changes which were adopted after the city's acknowledgment:

STATUTE		EFFECTIVE DATE
CHAPTER 197		
197.295-.313	'Needed Housing'	At First Periodic Rev
197.732	'Goal Exceptions'	1983
197.752	'Lands Available for Urban Development'	1983
CHAPTER 227		
227.175	'Application for Permit or Zone Change Fees'	At First Periodic Rev
227.178	'Final Action on Application for Permit or Zone Change Required within 120 Days	1983
227.180	'Review of Action on Permit' Application	1979,1981 1983

Requirement--ORS 197.295-313, Needed Housing

ORS 197.303 states that after periodic review "needed housing" also means: "(a) Housing that includes, but is not limited to, attached and detached single-family housing and multiple family housing for both owner and renter occupancy and manufactured homes; and (b) Government assisted housing." The statute exempts a city with a population of less than 2,500 or a county with a population or less than 15,000 from applying ORS 197.303(1)(a).

Response

This requirement is addressed under Factor Two, "Housing Rule."

Conclusion

The city satisfies this requirement.

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Response

This requirement is addressed under Factor Two, "Housing Rule."

Conclusion

The city satisfies this requirement.

Requirement--ORS 197.732, Goal Exceptions

ORS 197.732 revised the requirements for taking an exception to the statewide goals. These amended exception requirements were incorporated into Goal 2 and the Goal 2 rule (OAR 660-04-000).

Response

This requirement is addressed under Factor Two, "Exceptions Rule."

Conclusion

The city satisfies this requirement.

Requirement--ORS 197.752, Lands Available for Urban Development

ORS 197.752(1) requires that lands within urban growth boundaries shall be available for urban development concurrent with the provision of key urban facilities and services in accordance with locally adopted development standards. ORS 197.752(2) requires that, notwithstanding ORS 197.752(1), lands not needed for urban uses during the planning period may be designated for agriculture, forestry or other nonurban uses.

Response

The city states that it has adopted an urban growth boundary and a policy for the provision of urban services (Final Order, p. 25). The city's plan diagram designates land within the urban growth boundary for urban uses except for areas protected under Goal 5.

Conclusion

The city satisfies this requirement.

Requirement--ORS 227.175, Application for Permit or Zone Change Fees

ORS 227.175(1) requires a city to "establish fees charged for processing permits at an amount no more than the actual or average cost of providing that service."

ORS 227.175(2) requires a city to establish a consolidated procedure allowing an applicant to apply at one time for permits or zone change requests needed for a development project.

ORS 227.175(3)-(6) requires at least one public hearing, approval based on compliance with the comprehensive plan, notice to the applicant and other interested parties, notice to mobile home park tenants at least 20 but no more than 40 days before a

hearing on a proposed zone change for the mobile home park they reside within, and approval or denial of an application without a hearing if notice and appeal provisions are provided to those persons who would have had a right to notice if a hearing had been scheduled or who are adversely affected by the decision.

Response

The city has a consolidated hearing procedure in its zoning ordinance. Filing fees are established by the city council and are not more than the cost of providing the service. Notice to mobile home tenants is not addressed (Final Order, p. 26).

Conclusion

The city satisfies this requirement. Although the ordinance does not contain notice requirements for tenants of mobile home parks, the notice requirements in ORS 227.173 still apply to the city. This requirement should be included in the ordinance to insure that correct notice procedures are followed.

Requirement--ORS 227.178, Final Action on Application for Permit or Zone Change Required Within 120 Days

ORS 227.178(1) requires a city to take final action on a permit or zone change application, including all appeals, within 120 days of completion of the application;

ORS 227.178(5) applies the 120-day limit only to decisions wholly within the control of the city;

ORS 227.178(6) exempts those plan or land use regulation amendments or adoptions of new regulations that must be submitted to the DLCD Director under ORS 197.610(1) from the 120-day time limit; and

ORS 227.178(7) allows an applicant whose application has not been acted on finally within 120 days after the application was completed to seek a writ of mandamus to compel issuance of the permit or zone change or a determination that approval would violate the city's plan or land use regulations.

Response

The city has amended its zoning ordinance, Section 8.040, to require final action within 120 days (Final Order, p. 26).

Conclusion

The city satisfies this requirement.

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Response

The city has amended its zoning ordinance, Section 8.040, to require final action within 120 days (Final Order, p. 26).

Conclusion

The city satisfies this requirement.

Requirement--ORS 227.180, Review of Action on Permit Application

ORS 227.180(1)(a)(A) establishes that the period for filing an appeal of a local government's decision on a permit or zone change shall not be less than seven days after the governing body mails or delivers the decision of a hearings officer;

ORS 227.180(a)(B) and (C) require that a hearing on the appeal be held and that the record of the hearing officer's action be considered;

ORS 227.180(1)(b) states that, notwithstanding (1)(a), a city council may establish that a hearings officer's decision is the final decision of the city;

ORS 227.180(1)(c) requires that fees for filing an appeal shall be no more than the average cost of such appeals or the actual cost of the appeal excluding the cost of preparation of a written transcript; (1)(c) also requires that fees for preparation of written transcripts not exceed the actual cost of preparing the transcript, up to $500, plus one half of the actual cost over $500;

ORS 227.180(2) allows an aggrieved party in a proceeding for a zone change or discretionary permit to appeal the decision to LUBA;

ORS 227.180(3) states that ex parte contacts with a member of the decision-making body shall not invalidate a final decision or action of the decision making-body, provided that the member receiving the ex parte contact places the substance of the content of the ex parte contact on the record of the hearing, makes a public announcement of the content of the ex parte contact, and grants parties the right to rebut the content at the first hearing following the ex parte contact where action will be considered or taken.

Response

The zoning ordinance contains an appeal procedure for rulings of a city administrative officer or the planning commission (Section 8.030). The city's appeal procedure does not conflict with the statute (Final Order, p. 26).

Conclusion

The city satisfies this requirement. The city's appeal procedure does not conflict with the statute. The requirements for ex-parte contacts are self-executing and need not be included in the zoning ordinance.

CONCLUSION FACTOR TWO

The city has satisfied all of the requirements of Factor Two.

FACTOR THREE

NEW OR AMENDED STATE AGENCY PLANS OR PROGRAMS ADOPTED SINCE THE DATE OF ACKNOWLEDGMENT (OAR 660-19-055(2)(c))

"The comprehensive plan or land use regulations are inconsistent with a state agency plan or program relating to land use that was not in effect at the time the local government's comprehensive plan was acknowledged, and the agency has demonstrated that the plan or program:

(A) Is mandated by state statute or federal law;

(B) Is consistent with the goals; and

(C) Has objectives that cannot be achieved in a manner consistent with the comprehensive plan or land use regulation."

State agency programs that apply to the city were listed in the DLCD periodic review notice.

Department of Environmental Quality (DEQ)

Requirement

Local governments must maintain an up-to-date inventory of major air, water, solid, and hazardous waste and noise pollution sources and sites.

Response

There is no information in the updated DEQ inventories which is applicable to the city. There is no new information which needs to be added to the city's plan. The city's noise generators are the highway corridors (Highway 730, Highway 395, and Interstate 82) which traverse the city. The city has planned and zoned the areas adjacent to these noise generators for commercial and industrial uses as much as possible. The city's sewage plant has considerable excess capacity. There are no known air quality problems in the city. Solid waste is transported to the Hermiston Sanitary Service landfill, which is in compliance with state standards. (Final Order, p. 7,8.)

Conclusion

The city satisfies this requirement.

Requirement

Local governments which lack a policy or a complete policy to comply with state and federal air, water, solid and hazardous waste and noise regulations must adopt such a policy.

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(A) Is mandated by state statute or federal law;

(B) Is consistent with the goals; and

(C) Has objectives that cannot be achieved in a manner consistent with the comprehensive plan or land use regulation."

State agency programs that apply to the city were listed in the DLCD periodic review notice.

Department of Environmental Quality (DEQ)

Requirement

Local governments must maintain an up-to-date inventory of major air, water, solid, and hazardous waste and noise pollution sources and sites.

Response

There is no information in the updated DEQ inventories which is applicable to the city. There is no new information which needs to be added to the city's plan. The city's noise generators are the highway corridors (Highway 730, Highway 395, and Interstate 82) which traverse the city. The city has planned and zoned the areas adjacent to these noise generators for commercial and industrial uses as much as possible. The city's sewage plant has considerable excess capacity. There are no known air quality problems in the city. Solid waste is transported to the Hermiston Sanitary Service landfill, which is in compliance with state standards. (Final Order, p. 7,8.)

Conclusion

The city satisfies this requirement.

Requirement

Local governments which lack a policy or a complete policy to comply with state and federal air, water, solid and hazardous waste and noise regulations must adopt such a policy.

Response

The city's plan contains the following policy (final order, p. 27):

> "The city shall continue to meet State and federal air, water, solid and hazardous waste and noise quality standards."

Conclusion

The city satisfies this requirement.

Requirement

Local governments which have land use regulations relating to air, water, solid and hazardous waste and noise pollution which conflict with those of DEQ must amend them to be consistent.

Response

The city's order states (p. 28):

> "There are no Plan or Ordinance provisions which would interfere with the objectives of any DEQ plan or program adopted since acknowledgment."

Conclusion

The city satisfies this requirement.

Oregon Department of Transportation

Requirement

Parks Division (ODOT): Local governments must maintain an up-to-date inventory of state parks and assure that local plans are consistent and coordinated with state parks master plans.

Highway Division (ODOT): Local governments must amend Goal 11 elements to inventory proposed highway improvements, and to adopt a policy to coordinate with ODOT in implementing its Six Year Highway Improvement Program.

Response

There were no changes in the State Parks Master Plan which affect the city. The city has incorporated projects from the Six Year Highway Improvement Program into the Public Facilities Plan. The city has adopted a policy to coordinate with ODOT in implementing its improvement program (Ordinance No. 544). (Final Order, p. 28.)

Conclusion

The city satisfies this requirement.

Oregon Department of Water Resources

Cities relying upon surface water from any stream for which a minimum stream flow has been set by the Water Resources Commission as a significant part of local water supplies need to review their plans to assure that: (1) they have adequate water; (2) they have additional water rights to meet future needs; and (3) there is adequate flow in streams to fulfill water rights. If adequate water rights have not been obtained or flows are inadequate, additional supplies will have to be identified. Where cities have unexercised rights, use of those rights may affect junior water users, minimum flows, and instream users. Such facts must be addressed in the plan.

Response

New minimum stream flows have been established for the Umatilla River. These do not affect the city because the city obtains ample water from four deep wells (Public Facilities Plan, p. 8).

Conclusion

This requirement is not applicable to the city.

CONCLUSION FACTOR THREE

The city has satisfied all of the requirements of Factor Three.

FACTOR FOUR

ADDITIONAL PLANNING TASKS REQUIRED AT THE TIME OF ACKNOWLEDGMENT OR AGREED TO IN RECEIPT OF STATE GRANT FUNDS (OAR 660-19-055(2)(d))

Requirement

The city or county must do additional planning that:

(a) Was required in the comprehensive plan or land use regulations at the time of initial acknowledgment or that was agreed to by the city or county in the receipt of state grant funds for review and update; and

(b) Is necessary to make the comprehensive plan or land use regulations comply with the goals.

Conclusion

The city satisfies this requirement.

Oregon Department of Water Resources

Cities relying upon surface water from any stream for which a minimum stream flow has been set by the Water Resources Commission as a significant part of local water supplies need to review their plans to assure that: (1) they have adequate water; (2) they have additional water rights to meet future needs; and (3) there is adequate flow in streams to fulfill water rights. If adequate water rights have not been obtained or flows are inadequate, additional supplies will have to be identified. Where cities have unexercised rights, use of those rights may affect junior water users, minimum flows, and instream users. Such facts must be addressed in the plan.

Response

New minimum stream flows have been established for the Umatilla River. These do not affect the city because the city obtains ample water from four deep wells (Public Facilities Plan, p. 8).

Conclusion

This requirement is not applicable to the city.

CONCLUSION FACTOR THREE

The city has satisfied all of the requirements of Factor Three.

FACTOR FOUR

ADDITIONAL PLANNING TASKS REQUIRED AT THE TIME OF ACKNOWLEDGMENT OR AGREED TO IN RECEIPT OF STATE GRANT FUNDS (OAR 660-19-055(2)(d))

Requirement

The city or county must do additional planning that:

(a) Was required in the comprehensive plan or land use regulations at the time of initial acknowledgment or that was agreed to by the city or county in the receipt of state grant funds for review and update; and

(b) Is necessary to make the comprehensive plan or land use regulations comply with the goals.

Response

The final order states (p. 29) that this requirement is not applicable.

CONCLUSION FACTOR FOUR

Factor four is not applicable to the city's periodic review. Neither the city nor the Department have found any planning tasks which were required at the time of acknowledgment or agreed to in receipt of grant funds.

IV. OVERALL CONCLUSION

The Director terminates the City of Umatilla periodic review on the basis that the city has satisfactorily addressed the periodic review factors of ORS 197.640(3) and OAR--Division 19 Periodic Review.

JH/sp
<prr>

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J

EXHIBIT J

PROTECTED AREAS - OAR 345-21-015(i)(j)

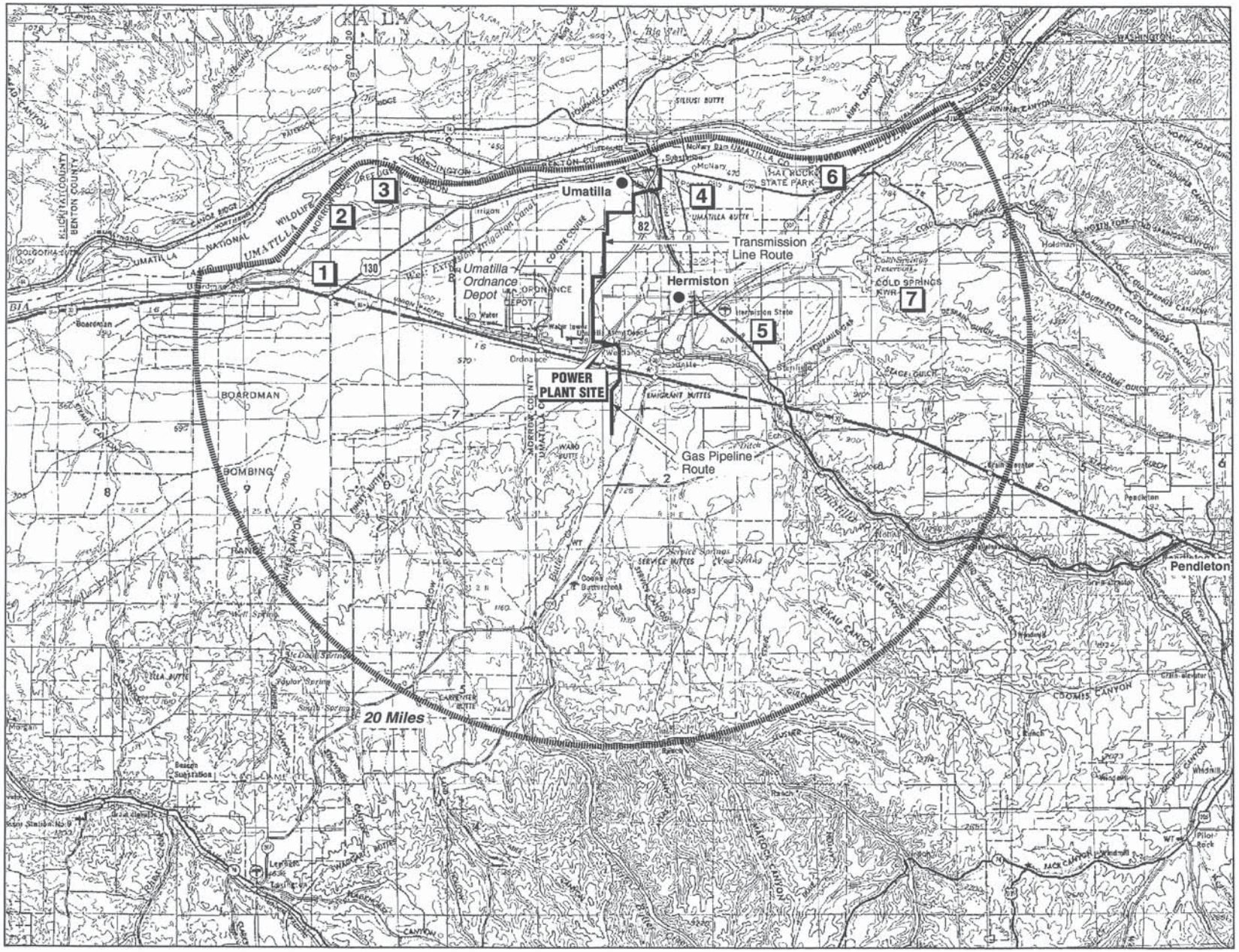
INTRODUCTION

With certain exceptions not relevant here, OAR 345-22-040 provides that the EFSC must find that (1) the components of the Project will not be located within any of the "Protected Areas" listed in OAR 345-22-040(1); and (2) taking into account mitigation, the design, construction and operation of the Project will not result in significant adverse impacts to any Protected Area. Exhibit J is relevant to those findings. As described in Exhibit C, the Impact Area for Protected Areas is within 20 miles of the energy facility, gas pipeline, or transmission line.

The Project is not located within Protected Areas as described in OAR 345-22-040. In addition, because of the distance of the Project from those areas, it will have no adverse impacts on them.

LOCATION OF PROTECTED AREAS -- Project Order Addendum 2 Paragraphs I.B and II.E.1

Figure J-1a is a map showing the locations of Protected Areas within the Impact Area. Table J-1 lists these areas and their distance and direction from the energy facility, gas pipeline, and electrical transmission line.



Protected Areas

1 – Coyote Springs State Wildlife Area
2 – Umatilla National Wildlife Refuge
3 – Irrigon Fish Hatchery
4 – Power City State Wildlife Area
5 – Hermiston Agricultural Research & Extension Center
6 – Hat Rock State Park
7 – Cold Springs National Wildlife Refuge

0 1 2 3 4 5 miles
Scale

NORTH

Hermiston Generating Company	
HERMISTON PROJECT	
Protected Areas Map	
Date: Rev. 3-30-93	Figure J-1a

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K

EXHIBIT K

FINANCIAL ANALYSIS

INTRODUCTION

Under OAR 345-22-050, the EFSC must find that Applicant has, or has reasonable assurance of obtaining, the funds necessary to construct, operate and retire the Project and to do so without violating its respective bond indenture provisions, articles of incorporation, common stock covenants or similar agreements. This Exhibit is relevant to that finding.

ESTIMATED LIFETIME OF THE PROJECT - OAR 345-21-015(1)(k)(A)(i)

Applicant's registered engineer estimates that the lifetime of the Project is between twenty-five and thirty years. The engineer's signed and stamped estimate is attached as Exhibit K-1.

ESTIMATE OF THE COST TO CONSTRUCT THE PROJECT - OAR 345-21-015(k)(A)(i)), Project Order Addendum 2, Paragraph II.F.3

Introduction

OAR 345-21-015(1)(k)(A)(i) requires Applicant to submit the estimated cost to construct the facility, which estimate is to be signed by an engineer and include the engineer's licensing stamp. To satisfy this requirement, Applicant represents that the total cost to construct the Project for a

commercial operation date of 1996 is $440 million, which includes the cost of developing, constructing, and equipping the Project. This figure was based upon estimates to construct the Project provided by Applicant's general contractor, Bechtel Power Corporation, which estimates are signed and stamped by a licensed engineer, and provided as Exhibit K-1.

The Applicant's Project Order Addendum 2 Paragraph II.F.3 provides that Applicant need not submit a detailed construction cost break-down if it submits information on the costs of similar facilities to show that Applicant's cost estimate is within a reasonable range for similar facilities. That information follows.

Costs to Construct Similar Facilities

Appendix 8-A of the Northwest Power Planning Council's (NWPPC) 1991 Northwest Conservation and Electric Power Plan includes a detailed breakdown of capital costs for a natural gas-fired combined cycle generating plant comprised of a two-unit General Electric Frame 7FA configuration, to be located in Hermiston, Oregon. This facility is substantially identical to the Project, except that the NWPPC's representative plant contemplates a single, shared steam turbine, rather than two separate steam turbines. The total output of this representative plant is 420 MW. A copy of the breakdown of construction costs for this plant from Appendix 8-A of the NWPPC 1991 Plan is provided as Exhibit K-4a. The total construction cost of the NWPPC's representative plant is given as $320 million in 1990 dollars. The $440 million estimated cost to construct the Project is within a reasonable range of the NWPPC's representative plant estimate given that the Project estimate includes escalation, as the Project will not be completed until early 1996. Six years of inflation (1996 - 1990) @ 5% would escalate the NWPPC plant from $320 million to $428 million. Comparing the "per kilowatt" unit capacity cost of the two projects yields a lower cost for the Hermiston project:

Project	Capital Cost	Size	Cost Per KW
NWPPC Project	$428 million	420 MW	$1,019/kw
Hermiston Gen. Proj.	$440 million	477 MW	$922/kw

This comparison does not take into account the additional costs to the NWPPC project for interest costs for funds used during construction, construction management, working capital reserves, and other non-construction costs that are already included in the Hermiston Generating Company Project total capital cost of $440 million.

The more-recent PGE 1992 Integrated Resource Plan (IRP) also includes an estimate of the construction cost of building a plant that is similar to the Project. PGE's estimate of these costs is for a 420 MW combined-cycle plant located near Boardman that is very similar to the NWPPC referenced plant. In fact, PGE relies on the NWPPC 1991 Northwest Conservation and Electric Power Plan for a number of assumptions it makes in its construction estimate. A copy of the capital cost break-down for the PGE reference plant is provided as Exhibit K-5a. The capital cost of the PGE reference plant is given as $356 million in 1992 dollars, including allowance for funds used during construction (AFUDC). If escalated to 1996, the $356 million translates to $432 million. The Hermiston Generating Project capital cost of $440 million is within the range of the PGE estimate, as well, and is lower on a per kw basis.

ESTIMATE OF THE COST TO OPERATE THE PROJECT - OAR 345-21-015(k)(A)(i) Project Order Addendum 2, Paragraph II.F.3

Introduction

The Applicant's Project Order Addendum 2 Paragraph II.F.3 provides that Applicant need not submit a detailed estimate of the cost to operate the Project if it submits information on the costs to operate similar facilities in order to show that its operational costs are within a reasonable range for similar facilities. That information follows.

Cost to Operate Similar Facilities

The NWPPC Representative Plant's non-fuel operating costs are stated as $5.81/kw-yr (fixed) and .4 mills/kwh (variable), in 1990$ (See Exhibit K-4a). The PGE 1992 IRP reference plant, described above, contains fixed and non-fuel variable operating costs of $5/kw-yr and 3 mills/kwh, respectively, in 1992$ (See Exhibit K-5a). The projected operating costs of the Hermiston Generating Project are less than these estimates.

ESTIMATED COST OF POWER PRODUCTION - OAR 345-21-015(k)(A)(ii)

OAR 345-21-015(k)(A) requires Applicant to provide the estimated cost of power production per kilowatt hour. However, Project Order Addendum 2 Paragraph II.F.3 provides that Applicant need not submit the estimated cost of power production if the expected rates for Project power sales will fall within the approved rates of approved Least Cost Plans. That information follows.

Approved Rates

PGE's most recent acknowledged resource plan, the 1990 IRP, estimates the lifecycle cost of a 420 MW two unit combined cycle combustion turbine (CCCT) facility comparable to the one described above and in Exhibit K-5a to be 39.5 mills/kwh (real, levelized 1989$), as shown in Exhibit K-6a. The 1990 plan calls for the acquisition of up to four CCCT units in each of three "preferred resource portfolios, " as indicated in the IRP Executive Summary, provided as Exhibit K-7a.

The PGE 1992 IRP estimates the all-in, lifecycle resource cost of reference plants such as the one described above and in Exhibit K-5a as ranging from 42 to 47 mills/kwh (real, levelized 1992$). Based on these estimated costs, PGE identified as its Preferred Resource Strategy the closure of the Trojan nuclear plant combined with, among other things, the acquisition of several hundred MW of natural gas-fired CCCT generating capacity of this type, as indicated in the IRP Executive Summary, provided as Exhibit K-8a.

The PGE 1992 IRP has not yet been acknowledged by the Oregon Public Utilities Commission, although a draft order has been issued recommending the acknowledgment of most of the IRP. However, PGE's 1992 IRP, dated November, 1992, represents one of the most recent estimates of the cost of resources available in the region.

In the NWPPC 1991 Plan, all-in, lifecycle resource costs for hypothetical, reference combined-cycle generating projects such as the one described above and in Exhibit K-4a were estimated at from 39 to 58 mills/kwh (real, levelized 1990$) for gas-fueled facilities, and 38 mills/kWh (real, levelized 1990$) for biomass-fired projects. (See Exhibit K-9a) On the basis of these estimates,

the NWPPC recommends the immediate acquisition of approximately 650 MW of these projects, with a preference for cogeneration, as indicated in the NWPPC 1991 Plan Action Plan, attached as Exhibit K-10a.

The NWPPC Plan is not subject to approval or acknowledgment by any state regulatory commission.

Bonneville Power Administration established, in 1992, a threshold lifecycle cost of 28 mills/kWh (real, levelized 1990$) for unsolicited proposals. This does not represent an approved rate, but is a strong indication of BPA's estimate of the cost of competitive regional resources.

Expected Rates From Project Power Sales

The cost of power to be produced by the Project will be based upon one or more wholesale power purchase agreements executed by Applicant and the utilities purchasing electricity from the Project. These agreements have not yet been executed but they will be executed prior to commencement of construction as required by OAR 345-25-010(3)(b).

On this basis, output from the Hermiston Project is being offered to regional utilities under a variety of prices and terms. As described below, energy and capacity from the Project has been priced to yield a lower all-in, life-cycle resource cost than the comparable resources that have been identified as competitive and preferred for acquisition in the least-cost plans described above, as well as other regional utility least-cost plans.

For firm energy and capacity, including fuel costs, offered prices for output from the Hermiston Project yield an equivalent all-in levelized resource cost at least 25% lower than the cost of similar, but hypothetical CCCT resources in both the 1990 and 1992 PGE IRPs,

Offered prices for output from the Project also yield a levelized resource cost well under the 39 mill/kWh resource cost estimated in the NWPPC plan for comparable resources. Further, offered prices from the Project are well under the 28 mills/kWh (real, levelized, 1990$) resource cost threshold for competitive projects established by BPA.

By these comparisons, it is evident that the Hermiston project is capable of selling power at competitive rates.

More important than competitive pricing, however, is the fact that energy and capacity prices from the Project are offered on a long-term, firm contractual basis, and will not be subject to revision once the Project is built and operating. Thus, utility customers are shielded from the risk that actual costs to construct and operate the Project will be greater than originally estimated, and that the Project not create an unforeseen financial burden once completed.

Capital Cost Amortization -- Project Order Addendum 2 Paragraph II.F.3

In the resource cost comparisons above, the methodology for determining the lifetime, levelized resource costs were those of the utilities for which the comparison is made. The Hermiston project's capital costs are assumed as amortized on a straight-line basis for book purposes.

SOURCES OF FUNDS - OAR 345-21-015(K)(A)(ii)(I), Project Order Addendum 2 Paragraph II.F.1

Introduction

The Project Order requires the submittal of information sufficiently complete and detailed to allow ODOE and EFSC to identify that a source of funds sufficient to construct, operate and retire the facility is or will be available.

OAR 345 22-050 requires the Applicant to demonstrate that there is *reasonable assurance* that a source of funds sufficient to construct, operate, and retire the facility is or will be available. Financing for the Hermiston Project will be provided through a combination of debt financing and equity funds contributed by the Hermiston Generating Company partners in a project-financing structure. The source of funds for the project will be owners' equity for approximately 20% of the total capital costs and debt for approximately 80% of the total capital costs. This would amount to equity of approximately $88 million (20% of $440 million total capital cost) and debt of approximately $352 million.

The project-financing structure is the same as that used for virtually every non-utility generation facility that has been constructed in the United States in the past ten years (For example, the trade publication, *Independent Energy,* in its annual Financial Digest reports of 1990-92, lists 137 project-financed transactions). Under the structure, upon obtaining all necessary permits and consummating all necessary commercial agreements for power sales, fuel supply, construction contracting, etc., Hermiston Generating Company would receive an infusion of equity from its owners (or an unconditional equity commitment) and would obtain a loan commitment from a bank or institutional lender, the two sources of which would pay for the capital cost of the facility, including reserves for working capital and debt repayment. At that point in time, Hermiston Generating Company would have available to it all the funds necessary to construct and operate the project.

Funds Prior to Close of Permanent Financing -- Project Order Addendum II, Paragraph F.2

Source of U.S. Generating Company Funds

USGen will fund the development of the Project until such time as development is completed and construction financing is arranged. Funds for project development during this period are provided to U.S. Generating Company by its two corporate parents, PG&E Enterprises and Bechtel Enterprises, which are wholly owned subsidiaries of Pacific Gas & Electric Company (PG&E) and Bechtel Group, Inc., respectively. PG&E is the largest combined electric and gas utility in the United States and Bechtel is one of the major engineering and construction companies in the world. U S. Generating Company - individually or in partnership with others - has developed, financed and commenced construction on nine projects in the past four years with total capital costs of approximately $3 billion. U. S. Generating Company has another five projects in the advanced stages of development with total capital costs of approximately $1.5 billion. No U. S. Generating Company project financing has ever failed or been substantially delayed.

U. S. Generating Company will retain a general management role in the project throughout its operating life, providing administrative and technical services to Hermiston Generating Company.

Funds for Construction and Operation-- Project Order Addendum 2, Paragraph II.F.1

Once project permits have been obtained and commercial terms consummated, the owners of Hermiston Generating Company will make an unconditional commitment to provide the equity portion of the capital cost financing, approximately 20%, or $88 million. The form of the commitment will either be (a) a direct infusion of cash, (b) a binding commitment letter to the lender, backed by PG&E and Bechtel creditworthy entities, (c) an irrevocable letter of credit, backed by a highly rated bank, or a combination of the above. Whatever the form, the equity commitment will be unconditional and the use of the funds will be limited solely to the construction and operation of the facility. This is the same equity financing structure that has been successfully employed in U. S. Generating Company's nine projects that are in construction and operation, and in virtually all non-utility generation projects nationwide.

At the same time as the owners commit their equity, the project lender will commit to fund the debt portion of the financing, approximately 80% or $352 million. Credit Suisse, one of the world's premier project-lending institutions, has reviewed the economics and proposed financing structure for the Hermiston project on a confidential basis, and has confirmed that the project appears to be economically viable, and that USGen should reasonably be able to obtain financing for the project. A letter discussing their review and expression of interest in providing the debt financing for the project is provided as Exhibit K-3a. As noted in the letter, Credit Suisse is rated AAA by Standard & Poor's and has provided over $1 billion of financing commitments to approximately 50 energy projects under similar financing terms, including Agent or Co-Agent roles on three USGen projects that have been financed and are now in construction,

Thus, prior to the commencement of construction, all of the funds necessary to construct and operate the project will be in place. At that point in time, the owners and lenders will have committed approximately $440 million to the project. Upon completion of construction, Hermiston Generating Company will have assets of approximately $440 million, consisting of

approximately $352 million in long-term debt obligations and $88 million in owners' equity or net worth.

Partners' Equity Percentage -- Project Order Addendum 2 Paragraph II.F.2

According to the Partnership Agreement provided as Exhibit A-1, the partners in Hermiston Generating Company, L.P. - wholly owned affiliates of PG&E and Bechtel Group, Inc, - have contributed capital and are allocated profits and losses according to the following percentages:

General Partner:	Buckeye Power Corporation (Bechtel)	49%
General Partner:	Larkspur Power Corporation (PG&E)	49%
Limited Partner:	PG&E Generating Company (PG&E)	2%

Buckeye Power Corporation will make its unconditional equity contribution pursuant to an agreement with its corporate parent, Bechtel Enterprises, which is the wholly owned subsidiary of Bechtel Group, Inc, and is the Bechtel parent of U. S. Generating Company. Larkspur Power Corporation and PG&E Generating Company will make their unconditional equity contributions pursuant to an agreement with their corporate parent, PG&E Enterprises, which is the wholly owned subsidiary of PG&E and is the PG&E parent of U. S. Generating Company.

Funds for Operation and Retirement

Funds for the operation and retirement of the Facility will be generated through the sale of electricity produced over the term of the power sales contracts that Applicant will execute. A requirement of financing (whether construction or permanent) will be satisfying potential lenders and equity investors that the revenues generated through the sale of electricity under these power sales contracts will be sufficient to cover all operating and capital costs, repay all loans and provide a market rate of return on both debt and equity. Applicant's provisions for retirement are described in Exhibit Z.

OPINION OF LEGAL COUNSEL - OAR 345-21-015(k)(A)(ii)(II)

An opinion from legal counsel stating that, to counsel's best knowledge, the Applicant has the legal authority to construct and operate the Project without violating its bond indenture provisions, articles of incorporation, common stock covenants, or similar agreements included at Exhibit K-2.

FINANCIAL STATEMENTS - OAR 345-21-015(k)(A)(ii)(III)

OAR 345-21-015(k)(A)(ii)(III) requires Applicant to provide financial statements of Applicant and each co-owner for the current fiscal year and preceding three fiscal years. However, Applicant is a partnership owned entirely by subsidiaries of PG&E and Bechtel Group. Neither it nor any of the subsidiaries that own Applicant have now or have had any assets other than initial capital contributions which have been made in nominal amounts. Consequently, they do not prepare and have not prepared financial statements. Capital contributions or unconditional commitments will be made to these companies upon financial closing and prior to the commencement of construction.

The Project Order Addendum 2 Paragraph II.F.1 provides that Applicant need not provide financial statements as described in OAR 345-21-015(k)(A)(ii)(III) if none are available if Applicant provides other information equivalent to the financial statements. The Project Order states that the information provided must be sufficiently complete and detailed to allow ODOE and EFSC to identify that a source of funds sufficient to construct and operate the facility is or will be available. That information is provided above.

GAS SUPPLIES AND PIPELINE CAPACITY -- Project Order Addendum 2, Paragraph II.F.4

The Project Order requires Applicant to provide either information on the reliability of gas supplies and pipeline capacity necessary for facility operation or provide copies of Letters of Intent for Gas Supply and Transportation Capacity on PGT.

Letters of Intent for Gas Supply from Alberta & Southern Gas Company (A&S) and Transportation from Pacific Gas Transmission (PGT) are provided as Exhibits K-11a and K-12a.

These letters demonstrate that reliable gas supplies and pipeline capacity necessary for facility operation are available.

The PGT letter confirms that company's interest in providing transportation services to potential firm customers, including the Hermiston Generating Project, with demonstrable long-term gas supplies and sufficient end-use requirements to support the requested service. The A&S letter of interest confirms that company's interest in making long-term gas supplies available for the project. The pricing terms of the A&S letter have been provided to U.S. Generating Company in confidence, and are not necessary to demonstrate the availability of reliable gas supplies. The pricing terms are, thus, deleted from Exhibit K-11a. However, these terms demonstrate the availability of reliable gas supplies at the prices we have incorporated in our power pricing.

CS CREDIT SUISSE

Exhibit K3a

FOUNDED 1856

SCHWEIZERISCHE KREDITANSTALT
CREDITO SVIZZERO

NEW YORK

Address Tower 49
12 East 49 Street
Telephone (212) 612-8000

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New York, N.Y. 10005

April 8, 1993

Mr. John R. Cooper
Senior Vice President, Finance
U.S. Generating Company
7475 Wisconsin Avenue, Suite 1000
Bethesda, MD 20814-3422

Dear John,

Credit Suisse is pleased to express an interest in the Hermiston project currently being developed by U.S. Generating Company (USGen), as described in your letter of April 6, 1993. Our interest is based on a review and evaluation of the project information supplied by USGen in that letter and its attachments, which we understand to reflect your estimates of construction, operating and financial variables.

On the basis of the information supplied to us by USGen and our understanding of the financial markets, the project appears to be economically viable, and USGen should reasonably be able to obtain debt financing in the amounts contemplated for construction, subject to market conditions at that time.

Upon completion of project development, Credit Suisse would be interested in more fully analyzing the project in consideration of an offer to provide financing for the project, subject to our normal due diligence review of final project contracts, regulatory status, full credit review by our management and other customary conditions. To remind you of our qualifications, Credit Suisse is rated Aa2 by Moody's Investors Service and AAA by Standard and Poor's and has provided over $1 billion of financing commitments to approximately 50 energy projects.

Credit Suisse values its strong relationship with USGen, which we have developed as agent, co-agent and lead manager in providing over $500 million of project financing underwriting commitments over the past two years for three projects developed by USGen. Credit Suisse has found USGen to be a highly capable developer of independent power projects, and we have been fully satisfied with the commitments provided by USGen's affiliates to provide equity to the projects it has developed. Credit Suisse is highly confident that USGen has the expertise and resources to successfully develop, finance, construct and operate the Hermiston project.

Sincerely,

John Fenn

John Fenn
Associate

Exhibit K4a

Northwest Power Planning Council Representative Power Plant

1 x 420 MW COMBINED-CYCLE COMBUSTION TURBINE

January 1990 Base Year

PLANT DESCRIPTION

Type:		Combined-cycle gas turbine generator power plant	
Configuration:		General Electric STAG 207F	
Site:		Two 146MW GE MS7001F GTGs; one 208MW steam TG	
		Hermiston, Oregon	
Primary Fuel:		Natural gas	
Heat Value (Btu/lb, HHV)		1000	
Delivery		Pipeline	
Inventory (days)		None	
Fixed Cost ($/kW/yr)		$0.00	
Variable Cost ($/MMBtu)		$3.16	
Alternate Fuel:		Distillate fuel oil	
Heat Value (Btu/lb, HHV)		19430	
Delivery		Truck, barge, pipeline or rail	
Inventory (days)		14	
Fixed Cost ($/kW/yr)		$0.00	
Variable Cost ($/MMBtu)		$4.87	
Environmental Controls: (Note 15)			
Heat Rejection		Wet mechanical draft cooling towers	Note 1
Air Emission Controls	SOx:	Low-sulfur fuel oil	
	NOx:	Water injection	
Grid Interconnection:			
Configuration		230kV, double circuit	
Distance (mi)		10	

PLANT PERFORMANCE

Net Capacity and Heat Rate (Higher Heat Value of fuel):

	Capacity (MW)	Heat Rate (Btu/kWh)	
35F ambient air temperature	452.2	7500	Note 2
59F ambient air temperature	419.6	7620	Note 2
88F ambient air temperature	377.7	7810	Note 2

Availability:		
Routine Inspection and Maintenance (days/year)	30	Note 3
Major Inspection and Overhaul (days/frequency)	90 days @ five-year intervals	Note 3
Average Annual Maintenance and Outage (days/year)	42	Note 3
Other Planned and Unplanned Outages (%)	6.0%	Note 3
Equivalent Annual Availability (%)	83.2%	Note 3
Service life (years)	30	Note 4

11-SEP-91

Northwest Power Planning Council Representative Power Plant

1 x 420 MW COMBINED-CYCLE COMBUSTION TURBINE

January 1990 Base Year

PLANT PERFORMANCE (CONTINUED)

Energy production potential by month (Percent of annual total): Note 5

Jan	9.2%
Feb	9.0%
Mar	8.8%
Apr	8.7%
May	8.4%
Jun	8.3%
Jul	8.1%
Aug	8.1%
Sep	8.3%
Oct	8.7%
Nov	8.9%
Dec	9.1%

DEVELOPMENT SCHEDULES

Siting and Licensing (months)	24	Notes 6,18,19
Equipment Procurement and Construction (months)	36	Note 7
Construction Cash Flow (% by year)	48/52	Note 7

SITING & LICENSING COSTS

Account	Acct.	Source	Price Year	Price Yr Estimate (MM$)	Escl. Index	Price Yr Index	Base Yr Index	Base Yr. Estimate (MM$)	Base Yr. Estimate ($/kW)
Land Option	SL1	Battelle(82) 15% of DC1	1/90	0.069	n/a	100	100	0.069	$0
Feasibility Studies	SL2	Battelle(82) 1% of TPC	1/90	3.044	n/a	100	100	3.044	$7
Env. Baseline, Licenses	SL3	Included in SL2	n/a	0.000	n/a	100	100	0.000	$0
	SL4			0.000	n/a	100	100	0.000	$0
	SL5			0.000	n/a	100	100	0.000	$0
	SL6			0.000	n/a	100	100	0.000	$0
Total Siting & Lic.	TSL							3.113	$7

OPTION HOLD COSTS

Account	Acct.	Source	Price Year	Price Yr Estimate (MM$)	Escl. Index	Price Yr Index	Base Yr Index	Base Yr. Estimate (MM$)	Base Yr. Estimate ($/kW)
Project Management	OH1	Note 8	1/86	0.050	GNP	1.124	1.288	0.057	$0.14
Siting Council Fees	OH2	$0.04/kW/yr, Henriques(84)	1/84	0.017	GNP	1.058	1.288	0.020	$0.05
Environmental Baseline	OH3	$0.14/kW/yr, Henriques(84)	1/84	0.059	GNP	1.058	1.288	0.072	$0.17
Land Option	OH4	Note 9	1/90	0.069	n/a	100	100	0.069	$0.16
Owner's Indirects	OH5	11% OH1-4, Henriques(84)	1/90	0.024	n/a	100	100	0.024	$0.06
Total Annual Hold Costs	THC							0.242	$0.58

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Northwest Power Planni Council Representative Power Plant

1 x 4 2 0 MW COMBINED-CYCLE COMBUSTION TURBINE

January 1990 Base Year

PLANT COSTS

Account	Acct. (Note 10)	Source	Price Year	Price Yr Estimate (MM$)	Escl. Index	Price Yr Index	Base Yr Index	Base Yr. Estimate (MM$)	Base Yr. Estimate ($/kW)
Direct Costs:									
Land	DC1	Fluor(88) T.6-8 (20A)	1/86	0.400	GNPD	112.4	128.8	0.458	$1
Power Generation	DC2	Fluor(88) T.5-1,2,3	1/88	152.616	HW30	276	346	191.323	$456
General Facilities	DC3	Fluor(88) T.5-1,2,3	1/88	56.013	HW7	260	276	59.460	$142
Fuel Oil Storage	DC4	Note 16	11/85	5.036	HW29	256	306	6.020	$14
Cats and Chemicals	DC5	Fluor(88) T.5-1,2,3	1/88	0.083	HW14	301	324	0.089	$0
	DC6			0.000	n/a	100	100	0.000	$0
	DC8			0.000	n/a	100	100	0.000	$0
	DC9			0.000	n/a	100	100	0.000	$0
	DC10			0.000	n/a	100	100	0.000	$0
Total Direct Cost	TDC							257.350	$613
Indirect Costs:									
Contractor O&P	IC1	Included in direct costs.	n/a	0.000	n/a	100	100	0.000	$0
Engineering	IC2	Included in direct costs.	n/a	0.000	n/a	100	100	0.000	$0
Construction Management	IC3	Included in direct costs.	n/a	0.000	n/a	100	100	0.000	$0
Contingency	IC4	Fluor(88) T.5-2, 10% TDC	1/90	25.735	n/a	100	100	25.735	$61
Owner's Cost	IC5	PNUCC(84), 4% of TDC+IC4	1/90	11.323	n/a	100	100	11.323	$27
	IC6			0.000	n/a	100	100	0.000	$0
Total Indirect Cost	TIC							37.058	$88
Burdened Costs:									
Switchyard	BC1	Included in direct costs.	n/a	0.000	n/a	100	100	0.000	$0
Trans. Interconnect	BC2	BPA, 10mi 230kV dbl ckt	1/87	3.710	HW33	252	297	4.373	$10
Spares	BC3	Fluor(88) T.6-8 (0.5% TPC)	1/90	1.522	n/a	100	100	1.522	$4
Prepaid royalties	BC4	Fluor(88) T.6-8 (None))	n/a	0.000	n/a	100	100	0.000	$0
Impact Mitigation	BC5	1% of TPC (Note 17)	1/90	3.044	n/a	100	100	3.044	$7
Fuel Supply	BC6	2 mi pipeline, $0.5/mi	1/88	1.000	GNPD	119.4	128.8	1.079	$3
Total Burdened Cost	TBC							10.018	$24
Total Plant Cost	TPC	TDC + TIC + TBC						304.426	$726

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Northwest Power Planning Council Representative Power Plant

1 x 420 MW COMBINED-CYCLE COMBUSTION TURBINE

January 1990 Base Year

PREPRODUCTION CAPITAL COSTS

Account	Acct.	Source	Qty.	Units	Base Yr. Estimate (MM$)	Base Yr. Estimate ($/kW)
Fuel inventory:						
Primary Fuel Inventory	FI1		0	days	0.000	$0
Secondary Fuel Inventory	FI2		14	days	5.232	$12
Total Fuel Inventory Cost	TFI				5.232	$12
Startup Costs:						
Fixed O&M	SU1	EPRI standard assumption	30	days	0.200	$0
Variable O&M	SU2	EPRI standard assumption	30	days	0.112	$0
Fixed Fuel	SU1	EPRI standard assumption	7	days	0.000	$0
Variable Fuel	SU3	EPRI standard assumption	7	days	1.697	$4
Equip. Modification	SU4	EPRI standard assumption	2.0%	percent total plant cost	6.089	$15
Total Startup Cost:	TSU				8.098	$19
Total Preproduction Cost	TPPC	TFI + TSU			13.330	$32

CAPITAL COST SUMMARY

Siting & Licensing		3.113	$7
Plant		304.426	$726
Preproduction		13.330	$32
Total Overnight Capital Costs	(Notes 1,18,19)	320.869	$765

OPERATING COSTS

Account	Acct.	Source	Price Year	Price Yr Estimate	Escl. Index	Price Yr Index	Base Yr Index	Base Yr Estimate
Fixed O&M ($/kW/yr)	OC1	Note 11	1/88	5.38	GNPD	119.4	128.8	$5.81
Var. O&M (m/kWh)	OC2	Note 12	1/88	0.243	GNPD	119.4	128.8	0.3
Consumables (m/kWh)	OC3	Note 13	1/88	0.1	GNPD	119.4	128.8	0.1
Byproduct Credit (m/kWh)	OC4	None	n/a	0.000	n/a	100	100	0.0
Cap. Rep. ($/kW/yr)	OC5	Included in OC1	n/a	$0.00	n/a	100	100	$0.00
Decomissioning	OC6	Note 14	n/a	$0.00	n/a	100	100	$0.00

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Northwest Power Plann Council Representative Power Plant

1 x 420 MW COMBINED-CYCLE COMBUSTION TURBINE

January 1990 Base Year

NOTES

1. The base case power plant includes mechanical draft cooling towers. Arid sites may require dry condenser cooling.

   A dry condenser cooling system is estimated to cost three times the cost of a wet mechanical draft cooling system. This increases direct power plant costs by $11.8 million. The fan load of a dry cooling system is estimated to be four times the fan load of a wet mechanical draft system, and the raw water pumping load of a dry cooling system is estimated to be one-fourth that of a wet system. The net effect on auxilliary loads would be an increase of 1.0 megawatt. The dry cooling system is assumed to be as effective as a wet system.

   The cost and performance effects of providing dry cooling are as follows:

Net capacity, 59F ambient (MW)	418.6
Heat rate at 59F ambient (Btu/kWh)	7637
Siting and Licensing ($/kW)	$8.00
Option Hold ($/kW//yr)	$0.58
Plant Costs ($/kW)	$760.00
Preproduction Costs ($/kW)	$33.00

2. From Fluor(88), Table 3-2, as corrected by Fluor(89), Table 1.

3. Availability assumptions from 1986 Power Plan. See NWPPC(86) for derivation.

4. Expected physical life when operated primarily for backing-up non-firm hydropower and with major overhauls at ten-year intervals.

5. Seasonality is due to ambient air temperature effects on combustion turbine output. From Figure 3.1 of BPA(86) using mean monthly temperature of Arlington, Oregon from NOAA(82).

6. Siting and licensing period is based on Puget Sound Power and Light construction experience with the Fredonia plant, as reported in PNUCC(84).

7. From Fluor(88) Table 5-4, rounded to the nearest year.

8. Annual cost of one engineering staff, as estimated by the Northwest Power Planning Council Coal Options Task Force.

9. Annual land option hold cost is estimated to be 15% of total land cost, based on Washington Water Power experience at the Creston site.

10. Cost estimates exclude sales tax.

11. Fixed O&M costs (1988$):

	(1000$/yr)
Standby maintenance material, Fluor(88) T.6-3	24.000
12 mo. base load operating labor, Fluor(88) T.6-4	1165.000
12 mo. base load maintenance labor, Fluor(88) T.6-4	525.000
12 mo. base load admin & support labor, Fluor(88) T.6-4	216.000
Subtotal:	1930.000
General and Administrative Costs (Home Office) (17%, PNL(85))	328.100
Total fixed O&M costs:	2258.100

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Northwest Power Planning Council Representative Power Plant

1 x 420 MW COMBINED-CYCLE COMBUSTION TURBINE

12. Variable O&M costs (1988$):

January 1990 Base Year

	(1000$/yr)	(mills/kWh)
Incremental 12-month base load maintenance material *	764.000	3.634
Subtotal variable costs	764.000	3.634
General and Administrative Costs (Home Office) (17%, PNL(85))	129.880	0.618
Total variable O&M costs	893.880	0.243

* (Fluor(88) T.6-4 less T.6-3)

13. Consumables costs (1988$):

	(mills/kWh)
Water, catalyst & chemicals, Fluor(88) T.6-6	0.086
Subtotal consumable costs	0.086
General and Administrative Costs (Home Office) (17%, PNL(85))	0.015
Total consumable costs	0.101

14. Salvage value is assumed to offset decomissioning costs.

15. The environmental emissions for the representative plant, operating on natural gas fuel are as listed below (35F ambient temperature, from Fluor(88) T.4-1):

	(lb/hr)	(T/MW/yr)	
SOx	2	0.02	
NOx	1290	12.49	*
CO	60	0.58	
Particulates (to atmosphere)	20	0.19	
Solid waste	Not significant		
Water discharge	106212	1028.77	**

* 75 ppmv; can be reduced further by additional water injection.
** Cooling tower blowdown and storm water runoff.

16. Fuel oil system costs were not included in the plant design basis of Fluor(88). Fuel oil system costs were obtained by scaling the estimates of auxilliary fuel oil system costs of BPA(87).

17. Based on Washington Water Power estimates for the Creston project.

18. The capital costs and siting and licensing schedules shown exclude costs and schedule effects of preparing the site for eventual conversion to coal gasification. A "gasifier-ready" combined-cycle power plant would require additional environmental assessment and other licensing activity to certify the site suitable for coal gasification; acquisition of additional land to accomodate the gasification plant and coal handling and storage facilities; and oversized common facilities to accomdate requirements of a gasification plant. The costs and schedule of a "gasifier-ready" combustion turbine power plant are estimated to be as follows:

	Base Case	Arid Site
Siting and Licensing Period (months)	48	48
Siting and Licensing ($/kW)	$41.00	$41.00
Option Hold ($/kW/yr)	$1.76	$1.76
Plant Costs ($/kW)	$729.00	$764.00
Preproduction Costs ($/kW)	$32.00	$33.00

19. The schedules and costs shown are for a complete plant. The incremental licensing schedule and costs of adding combined-cycle capability to an existing simple-cycle combustion turbine plant are provided below. The costs below are based on the net capacity shown.

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Northwest Power Plann. Council Representative Power Plant

1 x 420 MW COMBINED-CYCLE COMBUSTION TURBINE

January 1990 Base Year

	Base Case	Arid Site	Arid Site (Gasifier-ready)
Net Capacity, 59F ambient (MW)	420	419	419
Siting and Licensing Period (Months)	12	12	12
Siting and Licensing ($/kW)	$3.00	$4.00	$4.00
Option Hold ($/kW//yr)	$0.39	$0.40	$0.40
Plant Costs ($/kW)	$321.00	$355.00	$361.00
Pre-production Costs ($/kW)	$11.00	$12.00	$12.00

REFERENCES

BPA(87): Bonneville Power Administration. Comparative Electric Generation Study, Coal-fired Power Plants. Prepared by Kaiser Engineers. October 1987.

BPA(86): Bonneville Power Administration. Comparative Electric Generation Study, Coal Gasification, Shell Gasification-based Phasing Study. Prepared by Fluor Technology, Inc. November, 1986.

Fluor(89): Fluor Daniel, Inc. Comparison and Reconciliation of "Coal Gasification: Conversion of Medium Btu Gas to Electrical Energy, Shell Gasification - based Phasing Study" and "Development of Combustion Turbine Capital and Operating Costs". Prepared for the Bonneville Power Administration, Portland, Oregon. December 1989.

Fluor(88): Fluor Daniel, Inc. Development of Combustion Turbine Capital and Operating Costs. Prepared for the Bonneville Power Administration, Portland, Oregon. July 1988.

NOAA(82): National Oceanic and Atmospheric Administration. Monthly Normals of Temperature, Precipitation and Heating and Cooling Degree Days: 1951-1980. 1982.

Henriques(84): Letter from R. E. Henriques, Washington Water Power Company to J.C. King, Northwest Power Planning Council, dated July 17, 1984.

HW: Handy-Whitman Index of Public Utility Construction Costs

NWPPC(86): Northwest Power Planning Council. 1986 Northwest Conservation and Electric Power Plan. January 1986.

PNL(85): Pacific Northwest Laboratory. Electric Energy Supply Systems: Description of Available Technologies. February, 1985.

PNUCC(84): Pacific Northwest Utilities Conference Committee. "Working Paper, Development of Generic Resource Data". October 1984.

NOTE: All Costs in 1992 $

SUPPLY OPTION: Element	Units	240-MW Combined-cycle CT Plant Greenfield with Market Priced Gas	240-MW Combined-cycle CT Plant at Boardman with Market Priced Gas	240-MW Combined-cycle CT Plant at Beaver with Market Priced Gas	420-MW Combined-cycle CT Plant Greenfield near Boardman with Market Priced Gas	240-MW Combined-cycle CT Plant Greenfield with Fixed Price Gas	240-MW IPP/Large Cogeneration Purchase with Fixed Price Gas	165-MW Simple-cycle CT Plant Greenfield (staged) with Market Priced Gas	165-MW Simple-cycle CT Plant Greenfield (unstaged) with Market Priced Gas	Coal Gasification Combined-cycle CT Plant (2005+)
PERFORMANCE:										
Sustainable Capacity	MWp	240	240	240	420	same	same	165	165	400
Energy Capability	MWa	200	200	200	349	assumptions	assumptions	140	140	322
Fuel		gas/oil	gas/oil	gas/oil	gas/oil	as Greenfield	as Greenfield	gas/oil	gas/oil	coal
Heat Rate	MBTU/kWH	8.1	8.1	8.1	7.6	with Market	with Market	12.4	12.4	9.0
Scheduled Outage	days/yr	42	42	42	42	Priced Gas	Priced Gas	42	42	42
Sched. Outage Rate	%	12%	12%	12%	12%	except for	except where	12%	12%	12%
Forced Outage Rate	%	6%	6%	6%	6%	fuel	new values	4%	4%	9%
Equiv.Annual Avail.	%	83%	83%	83%	83%	"	appear	85%	85%	81%
Operating Life	years	30	30	30	30	"	"	30	30	30
LEAD TIME:										
Siting & Licensing	years	2	2	2	2	"	"	2	2	3
Construction	years	3	3	3	3	"	"	2	2	3
FIXED COSTS:										
Overnight Capital	$/kW	720	612	604	772	"	0	622	540	2165
Cash Flow Schedule	%/year	34/33/33	34/33/33	34/33/33	34/33/33	"	n/a	50/50	50/50	30/45/25
Installed Capital	$/kW	784	667	658	848	"	0	648	563	2365
Real Lev. Capital	$/kw-yr	93.5	79.4	78.5	101.1	"	0.0	77.0	66.9	284
Fixed O&M	$/kw-yr	5.2	5.2	5.2	5.2	"	90.0	2.1	2.1	69.5
Real Lev. Fixed	$/kw-yr	98.7	84.6	83.7	106.3	"	90.0	79.1	69.0	354
/(8.76*Eq.Avail)	$/MWH	13.5	11.6	11.5	14.6	13.5	12.4	10.6	9.3	50.1
VARIABLE COSTS:										
Real Lev.Fuel Price	$/MMBtu	3.76	3.76	3.76	3.76	3.14	3.49	3.76	3.76	1.56
Real Lev.Fuel Cost	$/MWH	30.5	30.5	30.5	28.6	25.4	28.3	46.6	46.6	14.0
Variable O&M	$/MWH	3.1	3.1	3.1	3.1	3.1	1.1	5.2	5.2	3.1
Consumables	$/MWH	-	-	-	-	-	-	-	-	-
Other Var. Costs	$/MWH	-	-	-	-	-	-	-	-	-
Real Lev. Variable	$/MWH	33.6	33.6	33.6	31.7	28.5	29.4	51.8	51.8	17.1
TOTAL DIRECT COST:										
Real Lev. Fixed	$/MWH	13.5	11.6	11.5	14.6	13.5	12.4	10.6	9.3	50.1
Real Lev. Variable	$/MWH	33.6	33.6	33.6	31.7	28.5	29.4	51.8	51.8	17.1
Total Real Lev.	$/MWH	47.1	45.2	45.0	46.3	42.1	41.7	62.5	61.1	67.2

Note: Assumes fixed price gas for first 15 years and market priced gas thereafter.

Plant On-Line Date Adjustment (for fuel price escalation)										
30-Year Real Lev. Fuel Price:										
On-line 1996 (92$)	$/MMBtu	3.8	3.8	3.8	3.8	3.1	3.5	3.8	3.8	1.6
On-line 2001 (92$)	$/MMBtu	4.2	4.2	4.2	4.2	3.3	3.7	4.2	4.2	1.7
On-line 2006 (92$)	$/MMBtu	4.5	4.5	4.5	4.5	3.5	3.9	4.5	4.5	1.7
On-line 2011 (92$)	$/MMBtu	4.8	4.8	4.8	4.8	3.6	4.1	4.8	4.8	1.8
Total Real Lev. Cost:										
On-line 1996 (92$)	$/MWH	47	45	45	46	42	42	62	61	67
On-line 2001 (92$)	$/MWH	51	49	48	49	43	43	68	66	68
On-line 2006 (92$)	$/MWH	53	51	51	52	45	45	72	71	69
On-line 2011 (92$)	$/MWH	55	54	53	54	46	46	75	74	69

Exhibit K6a

SAMPLE WORKSHEET

SUPPLY OPTION: Combined-cycle Combustion Turbines (2 CTs plus HRSGs)

Primary Reference: 1986 Regional Power Plan, 1989 Supplement, Table 4-9 (1988 $)

Variable	Units		
COSTS:			
Year of Costs		1988	Year in which capital and O&M costs are given (i.e., 1988 $).
1989 GNP Defl.	Ratio	1.046	Ratio of 1989 GNP Deflator to 1988 GNP Deflator.
Siting	$/kW	6	$6 per kW of installed capacity for siting cost.
Licensing	$/kW	-	Licensing cost is included in siting cost estimate.
Construction	$/kW	620	$620 per kW of installed capacity for "overnight" construction cost.
Startup	$/kW	-	Startup costs included in construction cost.
Fuel Inventory	$/kW	9	Carrying costs of 14 full power days of oil as backup when gas unavailable.
Capital Repl.	$/kW	-	This cost is calculated by RR program unless otherwise specified.
Decommissioning	$/kW	0	Decommissioning costs for CCCT assumed to be negligible.
Total Capital	$/kW	635	Total of the above capital costs.
Cash Flow	%/year	8/41/51	Amount of expenditures in each year (percent).
Salvage - nominal %		0	Salvage value in percent of capital cost (in year retired $).
Tax Life	years	15	Tax life according to current tax law.
Plant Type in RR Model		CT	Defines retirement dispersion (IOWA) for computing capital replacements.
Capital	1989 $/MWH	13.6	Output of PGE revenue requirements program, in 1989 $.
Fuel	1989 $/MMBtu	3	Rough average fuel cost for screening purposes only, in 1989 $.
Fixed O&M	$/kW-YR	5.4	Fixed O&M expense, in 1988 dollars per kW of installed capacity.
Variable O&M	$/MWH	2	Variable O&M expense, in mills/kwh (=$/MWH), in 1988 dollars.
Consumables	$/MWH	-	Nothing for CTs; lime for scrubber operation at coal plant.
Other		-	N/A
PERFORMANCE:			
Fuel		gas/oil	Two possible fuels for use at CCCT.
Heat Rate	MBTU/kWH	7.62	Heat rate in MBTU/kWH (7620 Btu/kwh), based on higher heating value (HHV).
Std. Capacity	MWp	420	ISO rated capacity (at 59 degrees F).
Std. Energy	MWa	294	Capacity times Capacity Factor.
Capacity Factor		0.7	Capacity factor used for calculating fixed cost ($/MWH) for screening.
Avail. Factor		0.78	Equivalent Annual Availability Factor (maximum possible capacity factor).
Sched. Out. Rate		0.115	Scheduled outage rate (fraction of year on maintenance).
Forced Out. Rate		0.120	Forced outage rate (fraction of time unavailable when not on maintenance).
Seasonal C.F.		see reference	See Table 4-9 in 1989 Supplement; 100% assumed for simplicity.
Emissions:			
Output:		See	See separate appendix for plant emissions.
SO2	lb/MMBtu	Appendix 6-8	See separate appendix for plant emissions.
NOx	lb/MMBtu	Plant	See separate appendix for plant emissions.
Part.	lb/MMBtu	Emissions	See separate appendix for plant emissions.
CO2	lb/MMBtu		
Control Req'd?			
SO2		yes*	Low-sulfur fuel oil required when not using gas.
NOx		yes	Water or steam injection required for NOx control.
Part.		yes*	Combustion control is sufficient with oil; negligible particulate with gas.
Other Env. Fact.			
SCHEDULE:			
Siting Time	years	2	Two years of siting time required for CCCT.
Const. Time	years	3	Three years of licensing time required for CCCT.
Operating Life	years	30	CCCT will have an operating of life of about 30 years.
Polit. Feas.		good	Political feasibility of CCCT is good compared with some options.
1989 COST PER MWH:			
Fixed	$/MWH	14.5	Capital Cost ($/MWH) + Fixed O&M at capacity factor above, real levelized.
Variable	$/MWH	25.0	(Heat Rate x Fuel Cost) + Variable O&M + Consumables, in 1989 $.
Total	$/MWH	39.5	Total (fully allocated) real levelized cost in 1989 $.

* assuming oil is to be burned also

** see seasonal cap.fac.table

SUPPLY OPTION: Variable	Units	Simple-cycle Combustion Turbines (2 Units@139)	Combined-cycle Combustion Turbines (2 CTs plus HRSGs)	Pulverized Coal Baseload (Twin 250 MW Units)	Pulverized Coal Baseload (Twin 603 MW Units)	Fluidized Bed Combustor Coal Baseload (197 MW unit)	Fluidized Bed Combustor Coal Baseload (twin 509 MW units)
COSTS:							
Year of Costs		1988	1988	1988	1988	1988	1988
1989 GNP Defl.	Ratio	1.046	1.046	1.046	1.046	1.046	1.046
Siting	$/kW	5	6	32	23	41	23
Licensing	$/kW	-	-	-	-	-	-
Construction	$/kW	530	620	1670	1210	1760	1270
Startup	$/kW	-	-	-	-	-	-
Fuel Inventory	$/kW	14	9	35	35	32	32
Capital Repl.	$/kW	-	-	-	-	-	-
Decommissioning	$/kW	0	0	-	-	-	-
Total Capital	$/kW	549	635	1737	1268	1833	1325
Cash Flow	%/year	48/52	8/41/51	2/8/24/40/23/3	4/11/17272812/1	4/11/37/43/5	4/10/152526119
Salvage - nominal %		0	0	-10	-10	-10	-10
Tax Life	years	15	15	20	20	20	20
Plant Type in RR Model		CT	CT	Coal	Coal	Coal	Coal
Capital	1989 $/MWH	11.7	13.6	38.4	30.3	39.8	32.1
Fuel	1989 $/MMBtu	3	3	1.5	1.5	1.5	1.5
Fixed O&M	$/kW-YR	2	5.4	32.8	20.5	37.1	20.7
Variable O&M	$/MWH	5	2	2.3	1.4	4.8	3.1
Consumables	$/MWH	-	-	0.7	0.5	-	-
Other		-	-	8.6 $/kW-yr*	8.6 $/kW-yr*	8.6 $/kW-yr*	8.6 $/kW-yr*
PERFORMANCE:							
Fuel		gas/oil	gas/oil	coal	coal	coal	coal
Heat Rate	MBTU/kWH	11.5	7.62	11	10.9	9.89	9.85
Std. Capacity	MWp	278	420	500	1206	197	1018
Std. Energy	MWa	195	294	350	844	138	713
Capacity Factor		0.7	0.7	0.7	0.7	0.7	0.7
Avail. Factor		0.80	0.78	0.77	0.75	0.77	0.75
Sched. Out. Rate		0.115	0.115	0.125	0.125	0.125	0.125
Forced Out. Rate		0.100	0.120	0.120	0.143	0.120	0.143
Seasonal C.F.		see reference	see reference	100	100	100	100
Emissions:							
Output:		See Appendix 6-8 Plant Emissions	See Appendix 6-8 Plant Emissions	See Appendix 6-8 Plant Emissions	See Appendix 6-8 Plant Emissions	See Appendix 6-8 Plant Emissions	See Appendix 6-8 Plant Emissions
SO2	lb/MMBtu						
NOx	lb/MMBtu						
Part.	lb/MMBtu						
CO2	lb/MMBtu						
Control Req'd?							
SO2		yes*	yes*	yes	yes	yes	yes
NOx		yes	yes	yes	yes	yes	yes
Part.		yes*	yes*	yes	yes	yes	yes
Other Env. Fact.							
SCHEDULE:							
Siting Time	years	2	2	4	4	4	4
Const. Time	years	2	3	5/6	6/7	5.3	6.3/7.3
Operating Life	years	30	30	40	40	30	30
Polit. Feas.		good	good	medium	medium	medium	medium
1989 COST PER MWH:							
Fixed	$/MWH	12.0	14.5	45.5	35.3	47.6	37.1
Variable	$/MWH	39.7	25.0	19.6	18.3	19.9	18.0
Total	$/MWH	51.8	39.5	65.1	53.6	67.5	55.1
		* assuming oil is to be burned also ** see seasonal cap.fac.table	* assuming oil is to be burned also ** see seasonal cap.fac.table	* fixed fuel cost (annual fixed cost of purch. and maint. of unit train rolling stock)	* fixed fuel cost (annual fixed cost of purch. and maint. of unit train rolling stock)	* fixed fuel cost (annual fixed cost of purch. and maint. of unit train rolling stock)	* fixed fuel cost (annual fixed cost of purch. and maint. of unit train rolling stock)

SUPPLY OPTION: Variable	Units	Coal Gasification Combined-cycle Combustion Turbines	Wind Farm 50 Turbines @ 200 kW/Turbine	Geothermal Double Flash or Binary	Solar Parabolic Trough	Solar Parabolic Trough with gas backup	Solar Photovoltaic Concentrating
COSTS:							
Year of Costs		1988	1988	1989	1989	1989	1985
1989 GNP Defl.	Ratio	1.046	1.046	1.000	1.000	1.000	1.148
Siting	$/kW	38	15	-	-	-	-
Licensing	$/kW	-	-	65	-	-	100
Construction	$/kW	1820	1007	2898	1995	2100	4850
Startup	$/kW	-	-	-	-	-	-
Fuel Inventory	$/kW	30	-	-	-	-	-
Capital Repl.	$/kW	-	-	-	-	-	-
Decommissioning	$/kW	-	10	80	-	-	-
Total Capital	$/kW	1888	1032	3043	1995	2100	4950
Cash Flow	%/year	12/48/40	40/60	33/33/34	10/45/45	10/45/45	50/50
Salvage - nominal	%	-10	0	-10	0	0	0
Tax Life	years	15	5	15	15	15	15
Plant Type in RR Model		CT	R3, 10-yr	R3, 25-yr	R3, 25-yr	R3, 25-yr	R3, 25-yr
Capital	1989 $/MWH	41.4	107	48.5	110	57.8	275
Fuel	1989 $/MMBtu	1.5	-	-	-	3	-
Fixed O&M	$/kW-YR	61.2	-	73	47	47	5
Variable O&M	$/MWH	0.2	10	3	-	-	2
Consumables	$/MWH	0.8	2	-	-	-	-
Other		8.6 $/kW-yr* -.2 $/MWH**	5% *	-	-	-	-
PERFORMANCE:							
Fuel		gas/oil/coal	wind	geothermal	Solar rad.	Oil/gas	Solar rad.
Heat Rate	MBTU/kWH	9.27	n/a	n/a	n/a	5.25	n/a
Std. Capacity	MWp	420	10	25	80	80	10
Std. Energy	MWa	294	2	22.5	20	40	2.8
Capacity Factor		0.7	0.2	0.9	0.25	0.5	0.28
Avail. Factor		0.75	0.20	0.90	0.25	0.70	0.28
Sched. Out. Rate		0.115	0	0.051	0	0	0
Forced Out. Rate		0.150	0.80	0.051	0.75	0.30	0.720
Seasonal C.F.		see reference	variable	100	?	?	?
Emissions:							
Output:		See Appendix 6-8 Plant Emissions				See Appendix 7-1 Treatment of Externalities	
SO2	lb/MMBtu		-	-	-		-
NOx	lb/MMBtu		-	-	-		-
Part.	lb/MMBtu		-	-	-		-
CO2	lb/MMBtu		-	-	-		-
Control Req'd?							
SO2		yes	n/a	n/a	n/a	yes*	n/a
NOx		yes	n/a	n/a	n/a	yes	n/a
Part.		yes	n/a	n/a	n/a	yes*	n/a
Other Env. Fact.			visual poll./ noise	visual pollution	vis. pollution		vis. pollution
SCHEDULE:							
Siting Time	years	4	2	1.5	1.5	1.5	2
Const. Time	years	3.3	1	2.3	1	1	2
Operating Life	years	30	20	30	30	30	30
Polit. Feas.		medium	good	good	Good	Good	Good
1989 COST PER MWH:							
Fixed	$/MWH	53.3	107.0	57.8	131	68.5	277
Variable	$/MWH	14.7	12.6	3.0	0	15.8	2
Total	$/MWH	68.0	119.6	60.8	131	84.3	280

* fixed fuel cost (annual fixed cost of purch. and maint. of unit train rolling stock)
** byproduct credit

* 5% of total production (royalty) est. 2 mills show as consumables

* assuming oil is to be burned also

SUPPLY OPTION: Variable	Units	Solar Thermal Stirling Dish	Solar Thermal Central Receiver	Nuclear WNP-3 Completion	Generic Light-Water PWR or BWR Reactor	Small Advanced Nuclear Plant (such as West. AP-600)	Generic Small Hydro**
COSTS:							
Year of Costs		1985	1985	1988	1988	1989	1989
1989 GNP Defl.	Ratio	1.148	1.148	1.046	1.046	1.000	1.000
Siting	$/kW	-	-	-	-	-	-
Licensing	$/kW	100	170	-	43	42	-
Construction	$/kW	3880	8430	1140	1425	1385	3000
Startup	$/kW	-	-	-	-	-	-
Fuel Inventory	$/kW	-	-	-	-	-	-
Capital Repl.	$/kW	-	-	-	-	-	-
Decommissioning	$/kW	-	30	see "other"	see "other"	see "other"	-
Total Capital	$/kW	3980	8630	1140	1468	1427	3000
Cash Flow	%/year	50/50	25/25/25/25	10/28/30/25/7	8/1717171717/7	12/25/25/25/13	25/50/25
Salvage - nominal %		0	0	-150	-150	-400	-30
Tax Life	years	15	15	15	15	20	20
Plant Type in RR Model		R3, 25-yr	R3, 25-yr	Nuclear	Nuclear	Nuclear	Hydro
Capital	1989 $/MWH	221	298	28.2	40.1	23.9	33.2
Fuel	1989 $/MMBtu	-	-	5 $/MWH	5 $/MWH	5 $/MWH	-
Fixed O&M	$/kW-YR	-	-	110	110	70	-
Variable O&M	$/MWH	11	10	0	0	0	5
Consumables	$/MWH	-	-	-	-	-	-
Other		-	-	1.3 $/MWH* .5 $/MWH**	1.3 $/MWH* .5 $/MWH**	1.1 $/MWH* .4 $/MWH**	-
PERFORMANCE:							
Fuel		Solar rad.	Solar rad.	Uranium	Uranium	Uranium	water
Heat Rate	MBTU/kWH	n/a	n/a	10.5	10.5	10.5	n/a
Std. Capacity	MWp	10	100	1240	1100	600	30
Std. Energy	MWa	2.8	50	806	715	480	30
Capacity Factor		0.28	0.5	0.65	0.65	0.8	1
Avail. Factor		0.28	0.50	0.65	0.65	0.80	1.00
Sched. Out. Rate		0	0	0.194	0.194	0.106	*
Forced Out. Rate		0.720	0.500	0.194	0.194	0.106	*
Seasonal C.F.		?	?	n/a	n/a	n/a	*
Emissions:							
Output:							
SO2	lb/MMBtu	-	-	-	-	-	-
NOx	lb/MMBtu	-	-	-	-	-	-
Part.	lb/MMBtu	-	-	-	-	-	-
CO2	lb/MMBtu	-	-	-	-	-	-
Control Req'd?							
SO2		n/a	n/a	n/a	n/a	n/a	n/a
NOx		n/a	n/a	n/a	n/a	n/a	n/a
Part.		n/a	n/a	n/a	n/a	n/a	n/a
Other Env. Fact.		visual pollution	visual pollution	nuclear waste	nuclear waste	nuclear waste	impact on waterway
SCHEDULE:							
Siting Time	years	2	2	2	5	4	3
Const. Time	years	2	4	5	6	4	3
Operating Life	years	30	30	40	40	60	50
Polit. Feas.		Good	Good	doubtful	doubtful	doubtful	not good
1989 COST PER MWH:							
Fixed	$/MWH	221	298	50.3	62.2	35.4	33.2
Variable	$/MWH	13	11	5.0	5.0	5.0	5.0
Total	$/MWH	234	309	55.3	67.2	40.4	38.2

* fixed fuel
** decomm. fund (capital repl. incl. in rev. reqmt. model)

* fixed fuel
** decomm. fund (capital repl. incl. in rev. reqmt. model)

* fixed fuel
** decomm. fund (capital repl. incl. in rev. reqmt. model)

* use typical generation pattern for other hydro

**See separate appendix for supply curve

SUPPLY OPTION: Variable	Units	Hydro Mill City Diversion	Hydro Minto 2A Powerhouse B	PGE Hydro Plant Efficiency Improvements**	Boardman Boiler Efficiency Improvement	Beaver Upgrade No. 1 New CT Parts	Beaver Upgrade No. 2 Add'l CT Parts + gen. upgrade
COSTS:							
Year of Costs		1988	1988	1989	1989	1989	1989
1989 GNP Defl.	Ratio	1.046	1.046	1.000	1.000	1.000	1.000
Siting	$/kW	-	-	-	-	-	-
Licensing	$/kW	-	-	-	-	-	-
Construction	$/kW	4220	7700	937	$4.5 million	676	413
Startup	$/kW	-	-	-	-	-	-
Fuel Inventory	$/kW	-	-	-	-	-	-
Capital Repl.	$/kW	-	-	-	-	-	-
Decommissioning	$/kW	-	-	-	-	-	-
Total Capital	$/kW	4220	7700	937	$4.5 million	676	413
Cash Flow	%/year	25/50/25	25/50/25	50/50	100	100	100
Salvage - nominal %		-30	-30	-30	0	0	0
Tax Life	years	20	20	20	20	15	15
Plant Type in RR Model		Hydro	Hydro	Hydro	Coal	CT	CT
Capital	1989 $/MWH	48.8	89	15.4		14.2	8.7
Fuel	1989 $/MMBtu	-	-	-	1.5	3	3
Fixed O&M	$/kW-YR	-	-	-	-	9.9	9.9
Variable O&M	$/MWH	5	5	-	-	0.3	0.3
Consumables	$/MWH	-	-	-	-	-	-
Other		-	-	-	-	-	-
PERFORMANCE:							
Fuel		water	water	water	coal	gas/oil	gas/oil
Heat Rate	MBTU/kWH	n/a	n/a	n/a	2-3% reduction	9.6	9.6
Std. Capacity	MWp	30	16	5	0	37	75
Std. Energy	MWa	30	16	3.2	0	26	53
Capacity Factor		1	1	0.64	n/a	0.7	0.7
Avail. Factor		1.00	1.00	0.64	1.00	see Beaver	see Beaver
Sched. Out. Rate		*	*	*	n/a	see Beaver	see Beaver
Forced Out. Rate		*	*	*	n/a	see Beaver	see Beaver
Seasonal C.F.		*	*	*	n/a	see Beaver	see Beaver
Emissions:							
Output:							
SO2	lb/MMBtu	-	-	-	-	see Beaver	see Beaver
NOx	lb/MMBtu	-	-	-	-	see Beaver	see Beaver
Part.	lb/MMBtu	-	-	-	-	see Beaver	see Beaver
CO2	lb/MMBtu	-	-	-	203	see Beaver	see Beaver
Control Req'd?							
SO2		n/a	n/a	n/a	n/a	Possible add'l controls required	Possible add'l controls required
NOx		n/a	n/a	n/a	n/a		
Part.		n/a	n/a	n/a	n/a		
Other Env. Fact.		impact on waterway	impact on waterway	none	none		
SCHEDULE:							
Siting Time	years	3	3	0	-	-	-
Const. Time	years	3	3	1.5	1	1	1
Operating Life	years	50	50	50	30	20	20
Polit. Feas.		not good	not good	good	good	good	good
1989 COST PER MWH:							
Fixed	$/MWH	48.8	89.0	15.4	n/a	15.8	10.3
Variable	$/MWH	5.2	5.2	0.0	n/a	29.1	29.1
Total	$/MWH	54.0	94.2	15.4	n/a	44.9	39.4

* use typical generation pattern for other hydro

* use typical generation pattern for other hydro

* use typical generation pattern for other hydro

**See separate appendix for supply curve Energy under critical water

* Also reduces heat rate by 2% (.18 MBTU/KW simple/combined cycle Composite heat rate used (see Beaver)

* Also reduces heat rate by 3% (.27 MBTU/KW simple/combined cycle Composite heat rate used (see Beaver)

SUPPLY OPTION: Variable	Units	Municipal Solid Waste Refuse-Derived Fuel @Portland	Municipal Solid Waste Refuse-Derived Fuel @Arlington	Municipal Solid Waste Refuse-Derived Fuel @Boardman	Municipal Solid Waste Mass Burn @Portland	Municipal Solid Waste Mass Burn @Arlington	Test MSW
COSTS:							
Year of Costs		1987	1987	1987	1987	1987	1989
1989 GNP Defl.	Ratio	1.082	1.082	1.082	1.082	1.082	1.000
Siting	$/kW	-	-	-	-	-	-
Licensing	$/kW	-	-	-	-	-	-
Construction	$/kW	3670	3300	3120	4770	4290	4000
Startup	$/kW	-	-	-	-	-	-
Fuel Inventory	$/kW	-	-	-	-	-	-
Capital Repl.	$/kW	-	-	-	-	-	-
Decommissioning	$/kW	-	-	-	-	-	-
Total Capital	$/kW	3670	3300	3120	4770	4290	4000
Cash Flow	%/year	33/33/34	33/33/34	33/33/34	33/33/34	33/33/34	33/33/34
Salvage - nominal %		-10	-10	-10	-10	-10	-10
Tax Life	years	20	20	20	20	20	
Plant Type in RR Model		R3, 25-yr	R3, 25-yr	R3, 25-yr	R3, 25-yr	R3, 25-yr	R3, 25-yr
Capital	1989 $/MWH	56.5	50.8	48	74.1	66.6	55.6
Fuel	1989 $/MMBtu	-45	-25	-25	-45	-25	-25
Fixed O&M	$/kW-YR	-	-	-	-	-	-
Variable O&M	$/MWH	60	51	42	55	47	32
Consumables	$/MWH	-	-	-	-	-	-
Other		-$75,000/yr* -___?___**	-$75,000/yr*	-$75,000/yr*	-___?___*	-	-
PERFORMANCE:							
Fuel		RDF	RDF	RDF	refuse	refuse	refuse
Heat Rate	MBTU/kWH	1.82	1.82	1.82	2.13	2.13	2.13
Std. Capacity	MWp	25.9	25.9	25.9	22.1	22.1	22.1
Std. Energy	MWa	22	22	22	18.8	18.8	18.8
Capacity Factor		0.85	0.85	0.85	0.85	0.85	0.85
Avail. Factor		0.85	0.85	0.85	0.85	0.85	0.85
Sched. Out. Rate		0.078	0.078	0.078	0.078	0.078	0.078
Forced Out. Rate		0.078	0.078	0.078	0.078	0.078	0.078
Seasonal C.F.		100	100	100	100	100	100
Emissions:							
Output:		See Appendix 7-1 Treatment of Externalities	See Appendix 7-1 Treatment of Externalities	See Appendix 7-1 Treatment of Externalities	See Appendix 7-1 Treatment of Externalities	See Appendix 7-1 Treatment of Externalities	See Appendix 7-1 Treatment of Externalities
SO2	lb/MMBtu						
NOx	lb/MMBtu						
Part.	lb/MMBtu						
CO2	lb/MMBtu						
Control Req'd?							
SO2		yes	yes	yes	yes	yes	yes
NOx		yes	yes	yes	yes	yes	yes
Part.		yes	yes	yes	yes	yes	yes
Other Env. Fact.		?	?	?	?	?	?
SCHEDULE:							
Siting Time	years	2	2	2	2	2	2
Const. Time	years	3	3	3	3	3	3
Operating Life	years	30	30	30	30	30	30
Polit. Feas.		poor	good	good	poor	good	good
1989 COST PER MWH:							
Fixed	$/MWH	56.5	50.8	48.0	74.1	66.6	55.6
Variable	$/MWH	-17.4	9.2	-0.5	-36.4	-2.4	-21.2
Total	$/MWH	39.1	60	48	37.7	64	34

* Recov'd mat'l* 15,000 Ton/yr @$5/Ton

* Recov'd mat'l* 15,000 Ton/yr @$5/Ton

* Recov'd mat'l* 15,000 Ton/yr @$5/Ton

* For value of steam produced

**For value of steam produced

SUPPLY OPTION: Variable	Units	Municipal Solid Waste Mass Burn @Boardman	Wood	Hanford Repowering Pulverized Coal	Hanford Repowering CCCT, exist. steam turb.	Hanford Repowering CCCT, high-press. turb.	Dispersed Fuel Cells Phosph. Acid 1st Generation (3 Units @10)
COSTS:							
Year of Costs		1987	1981	1988	1988	1988	1985
1989 GNP Defl.	Ratio	1.082	1.356	1.046	1.046	1.046	1.148
Siting	$/kW	-	-	23	6	6	-
Licensing	$/kW	-	-	-	-	-	-
Construction	$/kW	4050	1429	708	394	398	1426
Startup	$/kW	-	-	-	-	-	99
Fuel Inventory	$/kW	-	-	35	9	9	-
Capital Repl.	$/kW	-	-	-	-	-	-
Decommissioning	$/kW	-	-	-	-	-	-
Total Capital	$/kW	4050	1429	766	409	413	1525
Cash Flow	%/year	33/33/34	50/50	33/33/34	50/50	50/50	50/50
Salvage - nominal	%	-10	-10	-10	0	0	0
Tax Life	years	20	20	20	15	15	5
Plant Type in RR Model		R3, 25-yr	R3, 25-yr	Coal	CT	CT	R3, 25-yr
Capital	1989 $/MWH	62.9	38.8	15.6	8.7	8.8	31.8
Fuel	1989 $/MMBtu	-25	3	1.5	3	3	3
Fixed O&M	$/kW-YR	-	37.2	25	5.4	5.4	22
Variable O&M	$/MWH	39	2.8	2	2	2	8.9
Consumables	$/MWH	-	-	8.6 $/kW-yr*	-	-	-
Other			-	-	-	-	-
PERFORMANCE:							
Fuel		refuse	wood	coal	gas/oil	gas/oil	gas/lt.oil
Heat Rate	MBTU/kWH	2.13	15.5	7.93	8.17	7.85	8.3
Std. Capacity	MWp	22.1	25	765	777	809	30
Std. Energy	MWa	18.8	17.5	536	544	566	21
Capacity Factor		0.85	0.7	0.7	0.7	0.7	0.7
Avail. Factor		0.85	0.87	0.75	0.78	0.78	0.87
Sched. Out. Rate		0.078	0.08	0.125	0.115	0.115	0.019
Forced Out. Rate		0.078	0.05	0.143	0.120	0.120	0.114
Seasonal C.F.		100	100	100	see gen. CCCT	see gen. CCCT	100
Emissions:							
Output:		See	See	See	See	See	See
SO2	lb/MMBtu	Appendix 7-1	Appendix 7-1	Appendix 6-8	Appendix 6-8	Appendix 6-8	Appendix 7-1
NOx	lb/MMBtu	Treatment of	Treatment of	Plant	Plant	Plant	Treatment of
Part.	lb/MMBtu	Externalities	Externalities	Emissions	Emissions	Emissions	Externalities
CO2	lb/MMBtu						
Control Req'd?							
SO2		yes	no	yes	yes*	yes*	no
NOx		yes	?	yes	yes	yes	no
Part.		yes	?	yes	yes*	yes*	no
Other Env. Fact.		?	?				
SCHEDULE:							
Siting Time	years	2	2	3	2	2	2
Const. Time	years	3	2	3	2	2	1
Operating Life	years	30	30	30	30	30	30
Polit. Feas.		good	medium	good	good	good	good
1989 COST PER MWH:							
Fixed	$/MWH	62.9	47.0	21.3	9.6	9.7	35.9
Variable	$/MWH	-11.1	50.3	14.0	26.6	25.6	35.1
Total	$/MWH	52	97.3	35.3	36.2	35.4	71.0

* fixed fuel cost (annual fixed cost of purch. and maint. of unit train rolling stock)

Executive Summary

Introduction

Portland General Electric's "1990 Integrated Resource Plan: A Least Cost Approach" is a plan for carefully integrating future resource options with PGE's energy system in a way that represents the least overall cost to our customers and society.

Prepared pursuant to Order 89-507 of the Oregon Public Utility Commission, this Plan will be a core component of the Company's strategic business and operations plan. Through it, PGE will be able to initiate actions to meet customer demand over the next 20 years in a prudent, cost-effective and environmentally sensitive way. The Plan also articulates the Company's view of critical issues—such as how to account for the consequences of environmental impacts resulting from energy production.

We take seriously our responsibility to be good corporate citizens. This Plan demonstrates our commitment to responsible energy planning and environmental stewardship, and to serve the people, businesses and communities in our service territory with integrity and vision.

Full details of the Plan can be found in this 1990 Integrated Resource Plan document. Separate Appendices provide background on methodology and results, and a Public Process Document details the input of the various public participants.

The Building Blocks

To prepare its 1990 Integrated Resource Plan, PGE carried out an 18-month-long planning and public involvement process. At the heart of the process was the development of "building blocks" for the Plan. These included an assessment of future market demand, existing PGE resources and load/resource balance, demand-side options, supply-side options and externalities.

Future Market Demand. In serving seven Oregon counties and 54 cities, PGE currently provides 1,700 MWa of energy and 3,500 MW of capacity (peak) to its 570,000 retail customers. This accounts for approximately 40 percent of the electricity sales in Oregon. Based on a combination of end-use and econometric forecasting methodologies, PGE estimates that demand for energy over the next 20 years will increase between 350 MWa and 1,370 MWa, based on annual average growth rates ranging between 0.9 and 2.8 percent, and capacity will increase between 300 and 1,000 MW. Under the Moderate Growth future, demand would increase by 770 MWa at an average annual growth rate of 1.8 percent. These market demand figures take into account such factors as economic and demographic changes, fuel prices, technological improvements and fuel competition.

Existing Resources and Load/Resource Balance. PGE's present system includes power generated from hydroelectric, nuclear, coal-fired, and gas- and oil-fired plants, along with contract purchases and cogeneration. The system has the capability of producing 2,078 MWa of firm energy and 3,696 MW of firm capacity. Some existing resources will be retired and some contracts will expire during the 20-year planning period. Under the Moderate Load Growth future, additional resources will be needed to cover a projected energy deficit of about 70 MWa in 1992 (under critical water conditions) and capacity deficit of about 120 MW by 1996. Based on these facts and the analysis of future demand above, PGE will need to acquire at least 500 MWa of additional energy over the next 20 years—and possibly as much as 1,500 MWa under the High Growth future—to meet customers' needs. PGE recognizes that certain other factors, such as the possibility of acid rain legislation, relicensing requirements for existing plants and terms of the Canadian Entitlement, could affect the future load/resource balance. These factors have been taken into account in the Plan.

Demand-Side Options. PGE is committed to capturing demand-side resources, or energy efficiencies. The Company has made an explicit estimate of the resource value (energy savings) of its energy efficiency programs, and has begun taking these into account in developing future resource portfolios. This is an important departure from previous practices. Our analysis suggests that, over the next 20 years under Moderate Growth, there is a potential of 215 MWa of resource value, achievable through a combination of energy efficiency programs, codes, standards and market practices. Of this total, we estimate that under our High Growth forecast, up to 165 MWa are achievable through PGE's programs. This represents about 25 percent of future demand under Moderate Growth. We will develop programs and pilot projects to identify opportunities for increasing the energy savings from energy efficiency. We will revise our demand-side resource estimates and targets over time on the basis of experience gained through program implementation and verification of early demand-side programs.

Supply-Side Options. To determine which supply-side options (including system efficiency improvements) were acceptable, PGE assessed known technologies on the basis of availability, operating characteristics and real levelized cost. The highest-ranking resources in terms of cost tended to be system efficiency improvements, such as transmission and distribution loss reduction and improvements to hydroelectric generating facilities. Some options were screened out in this Plan due to concerns at this time about cost, technical feasibility or commercial availability. They included solar photovoltaic, wood, fuel cells, small advanced nuclear, coal gasification and ocean energy. Others, such as repowering of Hanford or completion of WNP-3, were ruled out because development of the resource and/or access to it is controlled by others. For each resource, energy supply curves were developed. Certain other values, such as dispatching flexibility and sensitivity to fuel availability and externalities, were considered.

Externalities. While not a traditional building block in energy resource planning, accounting for externalities is a corporate priority for PGE. In establishing least cost planning in Oregon, the OPUC recognized the importance of assessing the total societal costs of resource options, even when those costs will not be borne directly by the utility or its customers. Accordingly, PGE quantified externalities and has used these estimated costs in the evaluation of all potential resource portfolios. Doing so, however, is problematic. Few utilities have quantified externalities to the degree attempted by PGE. Fewer still have attempted to apply those costs to individual resources. Moreover, applying externality costs to resources—especially existing resources—may be a way to account for society's cost for a particular energy resource, but it also may artificially increase the actual cost of energy to the customer. This is a particularly difficult problem if not applied equally on a regional or national basis.

Proper accounting for externality costs is a valid public concern—today and in the future. PGE's efforts, we believe, have contributed to shedding further light on the subject. We will work with the OPUC and others to more fully develop this important aspect of least cost planning.

The Plan: Cost-Effective, Flexible and Energy-Efficient

Having assembled these sets of "building blocks", PGE integrated them into 13 separate trial plans to test how they would perform within PGE's energy system against various load growth futures and planning criteria. Each plan was then judged from the three perspectives—economic, customer and societal—and given an overall rating of acceptable, marginally acceptable or unacceptable.

This "integration and evaluation" step is essential to least cost planning. It enabled PGE to identify the most acceptable combination of resources to meet the needs and expectations of its customers, investors and the public. A detailed report card (see Chapter 8—Integration and Evaluation) shows how each trial plan was rated against these criteria.

PGE's Plan can be characterized by its reliance on the wise and efficient use of energy. Energy efficiencies and system efficiency improvements are the cornerstones of all future resource portfolios. All potential resource portfolios tested during the planning process shared a common set of base resources, totaling up to about 400 average megawatts (MWa). These resources are:

- system efficiency improvements (up to 18 MWa)
- energy efficiency measures (up to 165 MWa)
- special customer contracts (135 MWa)
- anticipated PURPA resources (up to 80 MWa)

In addition to this base of resources, a range of other resource options was considered in developing the Plan. These included demand-side as well as supply-side options. Resource options determined to be cost-effective and commercially available were integrated into the 13 trial plans for testing in simulations of PGE's energy system. Based on an evaluation of how well each trial plan performed from economic, customer and societal perspectives, a set of three "preferred resource portfolios" was selected.

The three preferred resource portfolios, in addition to the base resources listed above, contain the following resources:

1) The first portfolio calls for the addition of up to four 210-MW combined-cycle combustion turbines (CTs). The actual timing would depend upon the rate of load growth. This portfolio received the overall highest rating based on economic, societal and customer perspectives.
2) The second portfolio includes a 75-MW upgrade of PGE's existing Beaver plant and the firming of 125 MW of non-firm power. In addition, it includes up to three 210-MW CTs along with 200 MW of capacity acquisition, depending upon future load growth.
3) The third portfolio includes nearly 120 MW of geothermal resource. In addition, this portfolio includes the 75-MW Beaver upgrade, 200 MW of capacity acquisition and up to three 210-MW CTs.

Each of these portfolios was tested in trial plans against various load growth futures and sensitivities, and each was found acceptable from the economic, customer and societal perspectives. They are the least cost and most acceptable to our constituencies, plus they provide flexibility due to the relatively small size of individual projects and the short lead times necessary to develop the resource.

Implementation Strategy

Having identified preferred resource portfolios, PGE then considered how best to acquire future resources. The Implementation Strategy is based upon the assumption that the current regulatory environment remains essentially the same in the future. An important factor is the relationship between the risks and rewards of various forms of acquisition. Based on current circumstances, we concluded that some supply-side resources, such as the upgrades to PGE's existing facilities and demand-side options, may be developed by PGE directly. Other resources, such as geothermal energy and large supply-side options, likely will be developed by a third party and acquired through competitive bidding or purchase arrangements.

PGE will not only use the competitive bidding process to acquire resources, but to evaluate the relative advantages of purchase versus build.

Two-Year Action Plan

While the Plan represents PGE's 20-year view, actual implementation actions are contained in the Two-Year Action Plan. Here the Company's specific, short-term targets for energy efficiency, resource development and other aspects of the Plan are contained.

Demand-side actions include:

Lost Opportunity Savings: Capture 1.5 MWa of "lost opportunity" savings in 1991, and 1.9 to 2.7 MWa in 1992 in the residential, commercial and industrial markets utilizing such programs as Super Good Cents, Energy Smart Design and individualized design assistance for industrial facilities and processes.

Acquire Discretionary Resources: Capture 2.7 MWa of energy efficiency savings in 1991, and 3.3 to 5.7 MWa in 1992 in the residential, commercial and industrial markets focusing on weatherization, compact fluorescent bulbs and efficient lighting, hot water conservation, motors, and street lighting.

Demand-Side R&D and Evaluation: PGE is committed to the continual evaluation of its energy efficiency programs, demonstration projects and pilot programs necessary to help it and the region gain the experience necessary to develop new opportunities. PGE will obtain 0.1 MWa in 1991 and 0.3 MWa in 1992 from pilot and demonstration projects.

Supply-side actions include:

Transmission and Distribution: PGE is targeting savings of up to 13.3 MWa over the next 5 years through reduction of losses, conservation voltage regulation and power factor correction. Programs to accomplish this goal will begin in the next two years.

Enhance the Value of Existing Resources: PGE will obtain 1.5 MWa of resource through hydroelectric efficiency improvements at existing facilities. PGE also plans to construct a gas pipeline to provide direct gas service to its Beaver combined-cycle combustion turbine plant.

Acquire New Supply-Side Resources: PGE will issue a competitive bid solicitation in early 1991 for the purchase of up to 200 MW of capacity and 160 MWa of energy to be available by 1996. In addition, PGE will actively pursue the acquisition of up to 400 MW of capacity to replace its existing contract with BPA when it expires. PGE also anticipates that it will purchase PURPA resources as well as pursue and evaluate opportunities for long-term purchases of wholesale power.

Renewable Resource Development: PGE plans to find, evaluate and purchase, if cost-effective, renewable resources including hydroelectric, solar, wind and geothermal.

Customer Resource Options: PGE will work with its industrial customers to facilitate the development of cogeneration and special load management contracts. The 5-year target is to achieve up to 135 MWa by exercising options under existing special customer contracts. In addition, the Company will facilitate discussions between potential steam hosts within its service territory and developers to promote development of cogeneration for purchase under PURPA or competitive bid solicitation, as well as work with existing and new large customers to develop mutually beneficial, cost-effective solutions.

Plan Flexibility: Maintaining flexibility in the Two-Year Plan is essential to managing uncertainty. Thus, PGE will monitor rate of load growth, oil and gas prices, technological changes, and changes in regulation. Such changes could trigger modifications in the Two-Year Plan in the form of advancing or delaying development of certain resources, shifting emphasis among resource types and increasing or reducing the amount of power achieved from specific resources.

Responding to a Changing Business Climate

PGE intends to be a competitive, financially sound and socially responsible electric utility in the decades to come, one that consistently improves the economic well-being and quality of life for its constituents. The Company is committed to providing valued electric services and products that meet customer needs in a time when historical energy surpluses are quickly disappearing.

PGE believes that the "1990 Integrated Resource Plan" is responsive to the changing business climate affecting the energy industry—one that is transforming the electric energy business and placing a premium on competitive strategies that are cost-effective and provide value to the customer. For PGE, the Integrated Resource Plan describes both its retail plan (demand) and its production plan (supply) within the context of societal expectations.

For these reasons, this Plan is an essential guide in PGE's quest to change from the traditional utility of the past to the performance-oriented, aggressive and cost-conscious energy company of the future.

EXECUTIVE SUMMARY 1992 INTEGRATED RESOURCE PLAN

INTRODUCTION

Portland General Electric Company prepared this 1992 Integrated Resource Plan, commonly known as the Least Cost Plan, to meet our customers' energy needs at the least cost, consistent with the long-run public interest.

This Plan: 1) assesses customer demand for electricity over the next 20 years, 2) identifies and evaluates potential supply-side and demand-side resources, 3) assesses the economics of continued operation of the Trojan Nuclear Plant, 4) identifies a preferred resource strategy, and 5) outlines a Two-Year Action Plan for how we will begin to implement the preferred strategy.

To develop this Plan, we engaged in detailed study and analysis of energy planning issues and conducted an extensive public process to solicit input from technical and policy advisors. Our least cost planning Technical Advisory Group (TAG) and Public Policy Group (PPG) involved approximately 65 people directly in the planning process through a series of meetings extending over an eight-month period. In addition, we held special meetings with the environmental community and with our residential, commercial and industrial customers.

This Plan was subjected to public review during a 45-day public comment period that followed release of the draft Plan on August 31, 1992. The final Plan was submitted to the Oregon Public Utility Commission (OPUC) on November 13, 1992.

SUMMARY OF RESULTS

To develop our Least Cost Plan, the Company prepared analyses of the "building blocks" for the plan—future demand for electricity, size and characteristics of our existing resource base, potential demand-side and supply-side resource options, and the effects of external costs (costs to society for environmental effects of operating electricity generating resources).

Key findings include:

FUTURE MARKET DEMAND

- Demand for electrical energy by our customers will grow between 1.1% and 2.9% annually for the next 20 years. The Moderate Growth (base) case is 2.1% average annual growth.
- In terms of retail energy sales, the fastest-growing sector continues to be the commercial sector, although the residential sector is showing stronger than anticipated growth due to significant in-migration, especially from California.

EXISTING RESOURCES

- As of mid-1992, we provide 1,900 average megawatts (MWa) of energy annually to more than 600,000 customers.
- Because various existing resources, including Trojan, will no longer be available by the end of the planning period, we will require between 1,000 MWa and 2,100 MWa of additional resources over the next 20 years to meet projected demand.
- Under the Moderate Growth (base case) future, additional resources will be needed to cover a projected energy deficit of about 20 MWa by 1995 and peak capacity deficit of about 170 MW by 1993. This future would require about 1,500 MWa of new resources by 2012.

DEMAND-SIDE MANAGEMENT OPTIONS

- Over the next 20 years in the Moderate Growth future, we can reasonably rely on achieving up to 474 MW of peak load reduction and about 284 MWa of reduction of energy requirements (at the customer meter) through energy efficiency measures.
- This represents meeting more than 30% of new load growth and 10% of our total energy requirements through new demand-side resources.

SUPPLY-SIDE RESOURCE OPTIONS

- The highest-rated supply-side options are cost-effective transmission and distribution loss reduction, improvements to our hydro system, conservation voltage regulation, cogeneration, small hydro projects, combined-cycle combustion turbines, wind turbines, geothermal resources, and, when appropriate, exercising special contract provisions with certain industrial customers.
- Supply-side options not included in the Plan due to concern about cost, technical feasibility, commercial availability, or lack of control over the development and/or access to the resource are: Solar (both thermal and photovoltaic), fuel cells, repowering of Hanford units and new nuclear plants.
- Supply-side options with the greatest dispatching flexibility are combustion turbines and capacity contracts. Wind, small hydro, geothermal, solar, cogeneration, waste-to-energy, biomass and coal have the lowest dispatching flexibility.

EXTERNALITIES

- Most external costs are related to operation of fossil fuel-burning plants, primarily due to airborne emissions such as sulfur dioxide (SO_2). However, SO_2- and nitrogen oxide- (NO_X) related costs under the 1990 Clean Air Act are not expected to be major factors in new resource decisions. These costs tend to affect existing plants more than new plants.
- The greatest uncertainty in the externalities assessment is the possibility of global warming. Therefore, CO_2 dominates the analysis, with the potential for a CO_2 tax, emission allowance system or equivalent.
- A strategic mix of energy efficiency, cogeneration, combined-cycle combustion turbines, wind and geothermal is the most cost-effective method of reducing emissions and vulnerability to a CO_2 tax. Coal-fired resources are highly vulnerable to a CO_2 tax.

TROJAN ANALYSIS

- Immediate closure (i.e., 1993) of Trojan was found to not be a prudent course of action. It would likely impose about $400 million greater costs on customers than either continued operation or phase-out of the plant and threaten near-term reliability of service.
- Near-term loss of our share of Trojan's output (520 MWa of energy and 745 MW of capacity) would put immense stress on PGE's power system at a time when the region's energy surpluses no longer exist. Drought and endangered salmon issues also are threatening the region's supply of hydroelectric power. Without Trojan, the immediate energy and capacity requirements of our customers would exceed our current resources by 230 MWa of energy and 900 MW of capacity.
- Long-term operation of Trojan could be a prudent course of action. However, this option presents greater uncertainty and exposure to future costs than an orderly phase-out of the plant.
- In order to continue to operate Trojan to the end of its license life (2011), we must replace its steam generators within four years. The decision to replace the steam generators, at a cost potentially exceeding $200 million, must be made now if they are to be successfully installed by 1996.
- Responsible plant phase-out is a prudent course of action, allowing for an orderly transition to other resources and minimizing future uncertainty related to this resource. In light of the sensitivities and need to replace steam generators to continue to operate past 1996, we concluded that phase-out of the plant in 1996 results in the least cost to our customers. It will save our customers more than $100 million over the continue-to-operate strategy, while assuring near-term reliability for electric service.

From this information and the input from various advisory groups, the Company developed a series of potential resource strategies (in the form of trial plans) which were tested against various load growth futures, sensitivities to key variables (such as fuel prices) and how well they complement our current power system. This analysis involved measuring trial plan performance against Resource Evaluation Criteria that enabled the Company to evaluate results from four key perspectives—customer, economic, societal and shareholder.

PREFERRED RESOURCE STRATEGY

- The Preferred Resource Strategy is built on a base of resources that would be in the Company's new resource portfolio (under Moderate Growth, measured at the bus bar):
  — 314 MWa of energy efficiency
  — 100 MWa of renewable resources (wind and geothermal)
  — 100 MWa from repowering of our existing Beaver CT plant
  — 260 MWa from various other resources, including cogeneration
- Under Trojan phase-out, the Preferred Resource Strategy includes resources that have operating, cost and environmental characteristics of natural gas-fired combined-cycle combustion turbines (CCCTs), as described in Trial Plan 2.
- Under this strategy, 600 MW of CCCTs (500 MWa) (or equivalent amounts of independent or cogeneration power) would come on-line in 1996. In addition, a series of four 120-MW units would become operational in 2003, 2005, 2008 and 2010 (for a total of 400 MWa).

FIGURE S-1

Summary of Demand-Side Resource Targets
(MWa/Year)

Saved from:	1993	1994	1995-96	1997-2002	2003-2012
New Load	3.3	4.7	5.6	6.4	6.4
Existing Load	10.7	15.3	15.4	11.6	4.5
Total MWa Target/Yr	14.0	20.0	21.0	18.0	10.9
Cum. Total (MWa)	14.0	34.0	76.0	184.0	293.0
Millions/Yr ($-1992)	$24	$38	$42	$41	$29

- This strategy would result in 1,650 MWa of resources added to our system by 2012. This would allow us to meet anticipated future demand under Moderate Growth (1,070 MWa), loss of our share of Trojan's energy (520 MWa) and capacity (745 MW), and loss of various other current resources (approximately 100 MWa).
- To overcome a potential disadvantage of the preferred strategy (i.e., too great a reliance on natural gas as a fuel source), it would be possible for the Company to switch in subsequent years, depending on how the future unfolds, to an alternative strategy that would add 200 MWa of additional renewable resources in lieu of gas-fired combustion turbines.

TWO-YEAR ACTION PLAN

The Two-Year Action Plan describes the steps we plan to take in the 1993-94 time frame to begin to implement the Preferred Resource Strategy. This Action Plan was designed, using input received during the public process along with the results of extensive technical analysis, to acquire a cost-effective mix of demand- and supply-side resources.

The specific actions we will take over the next two years are listed below.

Demand-Side Resource Actions

The energy savings targeted in this Least Cost Plan are an aggressive ramp-up in the Company's energy efficiency goals. Near-term actions to begin acquisition of these resources are enumerated below:

- Aggressively capture energy efficiency savings in 1993 and 1994 through implementation of new programs and refinement of existing programs. *Target: 14 MWa in 1993 and 20 MWa in 1994.* (This is compared with a target of 7.2 MWa for 1992 in the 1990 Plan.)
- Our highest priorities are to secure "lost opportunities" (energy efficiencies in new construction which would be lost if not captured at the time of construction). But, we plan to expand the installation of demand-side measures in existing buildings as well.
- To achieve our targets, we intend to simplify existing programs, increase their visibility and develop new delivery channels.
- Work with the OPUC and interested parties to develop a successor to the SAVE incentive mechanism to continue to encourage investments in energy efficiency.

FIGURE S-1 summarizes the demand-side resource targets for the next two years, along with estimated annual program costs and the cumulative 20-year resource targets.

Supply-Side Resource Actions

- Capture savings due to reduced losses in the transmission and distribution (T&D) system. *Target: Up to 14.4 MWa over 10 years.*
- Implement system efficiency improvements in PGE's hydroelectric system. *Target: 1.2 MWa.*
- Enhance the value of our existing resources:
  - — Begin work to assure the long-term planned operation of the Boardman Coal Plant through either co-firing or the purchase of emission allowances.

Continue to improve the economics of coal supply and rail transportation to the plant.

— Increase the firmness of Beaver fuel supplies through a combination of gas storage, firm and interruptible transportation, and oil backups.

- Acquire Trojan replacement power:
  — Replace the 745 MW of capacity and related energy Trojan presently provides.
  — Evaluate more than 20 long-term resource proposals (for more than 5,000 MW), projects under PGE's control, and wholesale purchase options. Once the evaluation is complete, we will negotiate directly with any developers or utilities chosen and/or proceed with our own projects to achieve 600 MW of capacity—and 500 MWa of energy—in on-line resources by 1996.
  — Secure long-term gas supplies and firm transportation to assure the availability of gas-fired replacement resources.
  — Work with the Oregon Department of Energy (ODOE) and Energy Facilities Siting Council (EFSC) to expedite siting for replacement resources.
- Acquire new resources to meet load growth:
  — Issue a competitive bid solicitation in early 1993 to fill a portion of the projected power needs using the preferred resource strategy as the benchmark against which bids will be evaluated.
  — Compare other resource alternatives with competitive bids, using cost-effectiveness and resource criteria.
  — In addition to the 600 MW of projects noted above, acquire an additional 400-450 MW of capacity in 1995 and 1996 to: 1) replace a B.C. Hydro contract that expires in 1995, 2) meet increasing system capacity needs, and 3) provide another 145 MW of capacity required because of the phase-out of Trojan.
  — Commence siting activities in 1993 for the repowering of Beaver and begin siting work for potential expansion of the Boardman site.
  — Participate in demonstration and resource confirmation projects involving wind, geothermal, solar and biomass, where it is cost-effective. Target: Acquire up to 25 MW of wind resource by 1996 and 25 MW of geothermal resource by 1998.
- Develop industrial customer resource options:
  — Work with customers to jointly plan resource actions based on least cost planning principles. Existing agreements call for load reductions through process efficiency improvements or supply increases through cogeneration development. Other supply-side resources currently available in the region will be compared with customer resource options to ensure least cost resources are developed. Our preference is to continue to provide competitive electrical service to our industrial customers.

CONCLUSION

Our first Least Cost Plan in 1990 was built upon four principles: energy efficiency, cost-effectiveness, flexibility and environmental stewardship. These principles continue to guide our resource decisions.

We build upon those principles in this Plan by seeking to strike a balance to ensure that: 1) our customers have a reliable electric energy supply at competitive prices; 2) our share-

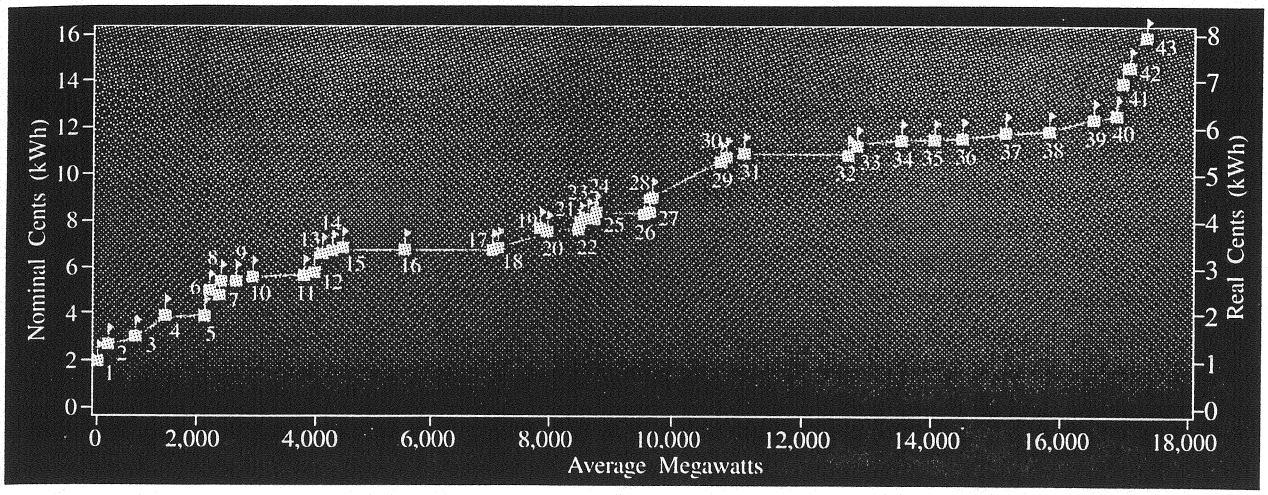
holders receive adequate return for their investments; 3) society benefits from our consideration of external environmental impacts; and 4) we can minimize the economic costs of operating our system and ensure that we have the flexibility to respond to changing circumstances.

Our 1992 Integrated Resource Plan accomplishes those objectives. Responsible phase-out of Trojan enables the Company to minimize future uncertainties and yet plan for the acquisition of resources to replace Trojan in an orderly, cost-effective way. Similarly, the significant amount of energy efficiency (about 300 MWa) and development of a contingency option which could lead to an additional 200 MWa of renewables in our portfolio demonstrate the Company's commitment to use environmentally sound resource technologies when they are cost-effective. In addition, the Company continues to lead the way in accounting for externalities in resource decisions.

For more information about our 1992 Plan or the planning process, contact: Manager, Least Cost Planning, Portland General Electric, 121 SW Salmon St. (1WTC-7), Portland, Oregon 97204, or call (503) 464-7477.

Resource Supply

Figure 5
How Much at What Cost?



	Available Resource	High Forecast Megawatts	Levelized Nominal Cost	Levelized Real Cost	Resource Category
1.	Conservation Voltage Regulation	100	1.4	0.7	Conservation
2.	Hydro Efficiency Improvements	110	2.2	1.1	Renewable
3.	Industrial 1	491	2.6	1.3	Conservation
4.	Water Heat	472	3.5	1.8	Conservation
5.	New Commercial Model Conservation Standards	647	3.7	1.9	Conservation
6.	Irrigation	43	4.6	2.3	Conservation
7.	Commercial Renovations and Remodel	144	4.6	2.3	Conservation
8.	Small Hydro 1	90	5.0	2.5	Renewable
9.	Transmission and Distribution Efficiency Improvements	200	5.1	2.6	Conservation
10.	Industrial 2	308	5.3	2.7	Conservation
11.	Existing Commercial	859	5.4	2.7	Conservation
12.	New Single-Family Residential Model Conservation Standards	213	5.6	2.8	Conservation
13.	Multifamily Residential Weatherization	57	6.3	3.2	Conservation
14.	Single-Family Residential Weatherization	124	6.4	3.2	Conservation
15.	New Manufactured Housing	131	6.5	3.3	Conservation
16.	Hydrofirming (Combined-Cycle 1)	1,070	6.6	3.3	High Efficiency
17.	Hydrofirming (Combined-Cycle 2)	1,430	6.6	3.3	High Efficiency
18.	New Multifamily Residential Model Conservation Standards	20	6.7	3.4	Conservation
19.	WNP-3	868	7.3	3.7	Thermal
20.	Thermal Plant Efficiency Improvements	56	7.4	3.7	High Efficiency
21.	Cogeneration 1 (Biomass Fueled)	480	7.5	3.8	Renewable
22.	Cogeneration 2	57	7.6	3.9	High Efficiency
23.	New Residential Lighting	63	7.9	4.0	Conservation
24.	Hot Water Heat Pumps	136	8.0	4.1	Conservation
25.	Municipal Solid Waste	30	8.1	4.1	Renewable
26.	WNP-1	818	8.1	4.1	Thermal
27.	Small Hydro 2	100	8.2	4.2	Renewable
28.	Existing Residential Lighting	26	8.8	4.5	Conservation
29.	Cogeneration 3	1,130	10.3	5.3	High Efficiency
30.	Wind 1	29	10.5	5.3	Renewable
31.	Geothermal	350	10.7	5.4	Renewable
32.	Eastern Montana Coal Gasification	1,704	10.7	5.5	Thermal
33.	Small Hydro 3	130	11.1	5.6	Renewable
34.	Eastern Washington Coal Gasification	745	11.3	5.7	Thermal
35.	Cogeneration 4	540	11.3	5.7	High Efficiency
36.	Expensive Conservation	412	11.4	5.8	Conservation
37.	Eastern Oregon Coal Gasification	745	11.5	5.8	Thermal
38.	Western Washington/Oregon Coal Gasification	750	11.7	5.9	Thermal
39.	Nevada Coal Gasification	716	12.2	6.2	Thermal
40.	Wind 2	376	12.3	6.3	Renewable
41.	Small Hydro 4	90	13.7	6.9	Renewable
42.	Biomass	90	14.5	7.4	Renewable
43.	Wind 3	253	15.7	8.0	Renewable
44.	Solar Thermal	480	16.0	8.0	Renewable
45.	Ocean Wave Power	N/A	16.0	8.0	Renewable
46.	Solar Photovoltaics	On-Site Applications	30.0	15.0	Renewable

Action Plan

Action now is imperative, and, as already explained, the Council designed a framework of four broad objectives to structure that action. To meet these objectives, we've identified more than 80 activities. These activities are listed on pages 49 and 50, and described in detail in Volume II, Chapter 1.

The first objective is perhaps the most ambitious: start now to buy all the low–cost resources available. All resources take time to develop, and it is likely that at least the low–cost ones will be needed within the coming decade.

The second objective is to shorten the time it takes to acquire and fully develop a resource to the point that it is producing electricity. This shortened lead time improves the region's ability to respond quickly to growth or to changing patterns of energy use.

The third objective is to promote diversity in future plans by confirming the cost and availability of additional resources. This Action Plan is not meant to limit the pursuit of new technologies or alternative resources. On the contrary, it is an invitation to expand that research. We need to get reliable information about these resources so that, if needed, they will be there.

The fourth objective focuses on regulatory, legislative and environmental actions that provide incentives for, and remove barriers to, the successful implementation of this plan. The Council will work with regulatory and legislative bodies to improve public policies and laws that can facilitate the actions called for in this plan.

Actions for Bonneville, the region's utilities, regulatory bodies, and state and local governments are included. The Council recognizes that each of these entities faces different problems and opportunities. They have different constituencies. But their constituencies overlap, forming a network we hope will stretch to every Northwest ratepayer.

In this plan, the Council assumes that Bonneville will meet the needs of its current customers—public power and the direct service industries. At the same time, we assume that investor–owned utilities develop resources

independently to meet the needs of their customers.

While aggressive action is needed by all utilities, those that are investor-owned will likely need new power supplies before most of the public utilities. But if all utilities cooperatively buy the lowest-cost resources first, we have estimated that the region could save $3.6 billion over the cost of independent resource development. (See Volume II, Chapter 10, for more detail.)

Objective 1: Acquire All Low-Cost Resources

The region's electricity system is currently in load/resource balance. That is, the supply of electricity is equal to the demand for it. But 84 percent of the hundreds of forecast scenarios we tested indicated additional growth in electricity demand by the year 2000. Therefore, the need for additional resources is highly probable during the coming decade, and with strong growth, that need is urgent. Under these conditions, immediate acquisition, particularly of low-cost resources, makes sense.

Low-cost resources called for in this plan include efficiency improvements in the generation, transmission, distribution and end use of electricity. Energy conservation in all sectors—residential, commercial, industrial and agricultural—falls into this category.

The 1,500-megawatt conservation figure is not a cap.

There also are low-cost generating resources, such as hydroelectricity and cogeneration, that are cost-effective and needed by the year 2000 under most future scenarios. The average cost of these resources is less than the regional avoided cost[5] of about 7.5 cents per kilowatt-hour.

While the current regional avoided cost is useful as a guide for acquiring generating resources, it is *not* the appropriate cost-effectiveness limit for individual conservation measures. Instead, conservation programs should include all commercially available energy-saving measures that are expected to cost up to 11 cents per kilowatt-hour.

This is because conservation as a resource has several advantages that are not captured in the 7.5 cents per kilowatt-hour figure. Electricity that is generated requires transmission and distribution lines, and energy is lost on its way to customers. Conservation has neither the added expense of transmission lines nor the line loss en route. Energy savings also have fewer environmental impacts than any of the generating resources included in this plan. Furthermore, many conservation programs closely track growth and decline in the economy.

Failure to purchase these environmentally sound and economical resources now could force acquisition of more costly and more environmentally damaging resources later. If only cheaper measures are installed, and the higher cost measures are postponed, it will cost more and be much more difficult to return to the site to install additional measures.

Efficiency Improvements

The Council calls for immediate activities to begin acquisition of all regionally cost-effective efficiency improvements. We have chosen a target of 1,500 average megawatts of efficiency gains to be acquired by the year 2000. This is enough energy to meet the needs of one and a half Seattles. In the medium-high scenario, this amount of conservation would provide more than half the region's new electricity needs. (See Figure 17.)

No opportunity for energy conservation should be missed. The successful completion of this action will mean installing cost-effective measures in nearly every residence, commercial enterprise and industrial facility in the

5. Avoided cost is an investment guideline to use when choosing resources. It is the cost of alternatives that are avoided if you purchase the resource you are reviewing.

Northwest. It means operating programs in the commercial and industrial sectors at levels many times greater than anything attempted to date in this region. Acquiring the efficiency improvements identified under this objective will require capital expenditures by utilities and customers of about $7 billion by the year 2000. (See Figure 18.)

While we are targeting 1,500 megawatts, the actual amount of efficiency improvements could be higher, depending on how well acquisition mechanisms work, how quickly the infrastructure is developed to support this level of acquisition and the rate of development of new conservation measures.

The 1,500–megawatt figure is not to be interpreted as a cap. It is instead, a planning target for the Council to use in establishing actions related to other resources. Because of the current stresses on the system, the Council has committed itself to take actions to speed up resource acquisitions. For example, we intend to work with state legislatures and regulatory agencies to promote the purchase of conservation.

In addition, we will encourage refinements in conservation programs, so energy savings can be secured more easily, and we also will support investigations to bring in still more cost–effective conservation.

Utilities running conservation programs should periodically review their budgets to ensure that they are adequate to capture all regionally cost–effective conservation resources as they become available.

This first objective, like all significant resource decisions, does not come without risk. If electrical loads suddenly drop off, the resource commitments started in this action item could lead to a moderate energy surplus. However, conservation needs a substantial long–term commitment to allow for programs and other acquisition mechanisms to be designed, implemented, evaluated and modified. For this reason, the Council's highest priority is a stable, yet aggressive, conservation effort during the 1990s.

The Power System

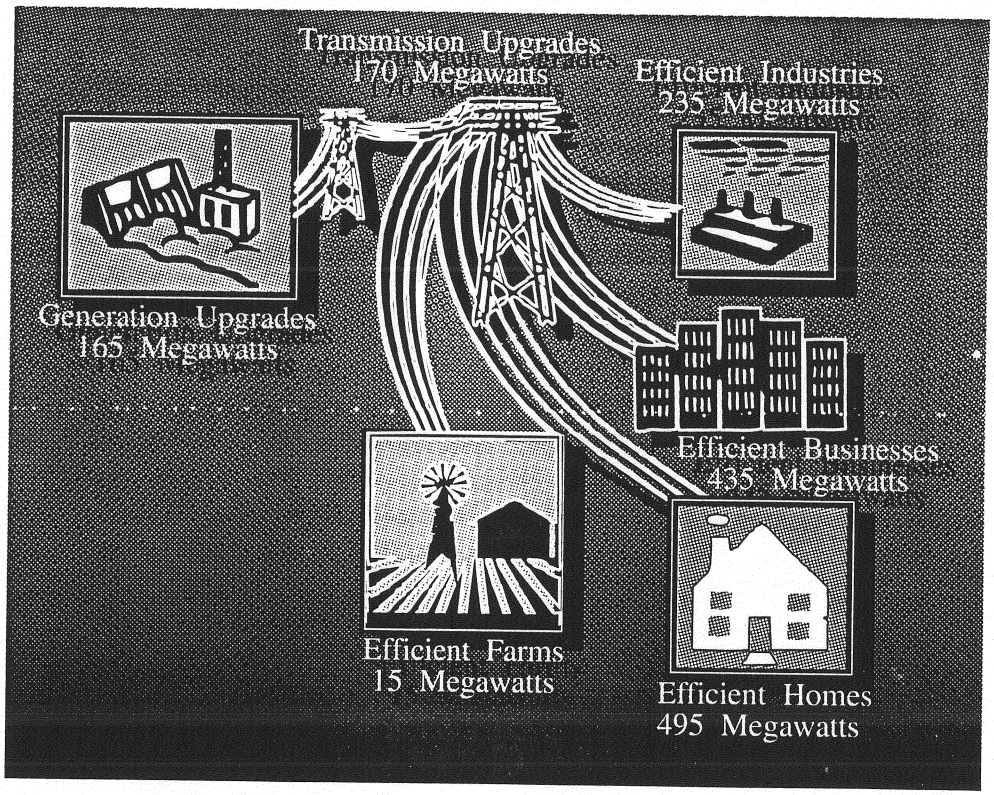


Figure 17
Acquire at Least 1,500 Megawatts of Conservation and Efficiency Improvements by the Year 2000

Efficiency Spending

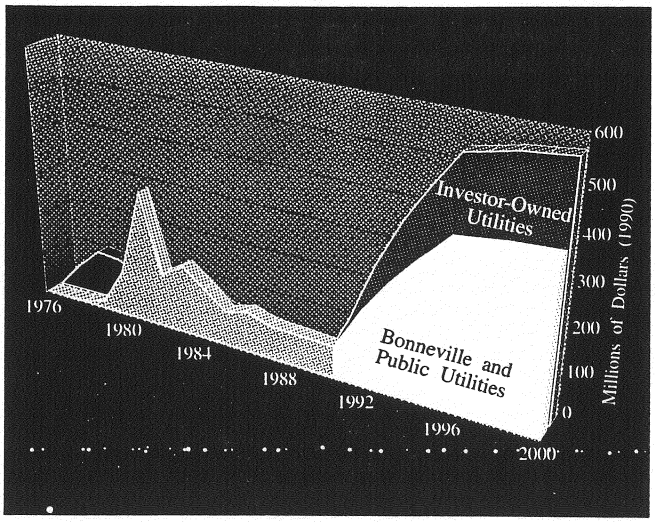


Figure 18
Expenditures by Consumers and Utilities Will Total About $7 Billion Between 1991 and 2000

There also is little risk of "overbuilding" conservation because significant energy savings are needed in all of the most likely growth scenarios. With slower growth, conservation savings from new buildings and equipment are automatically reduced because fewer homes and businesses are built. Even if some overbuilding occurs, because of its low cost and likely sales to California, the cost to the region is not great. Underbuilding is a much more serious outcome, which could cost the region billions of dollars.

Acquiring these efficiency improvements will require a variety of approaches, including aggressive conservation programs and innovative marketing. Bonneville and the utilities should encourage creative approaches for acquiring cost–effective conservation measures, whether these are developed by utility or non–utility providers. At the same time, utilities need to continue their traditional conservation programs until innovative approaches can be proven to be a more effective means of delivery.

It will take a remarkable financial and institutional commitment from the region to expand education and training opportunities to provide the work force for this large–scale undertaking. To achieve the conservation needed, the Northwest should begin now to train large numbers of personnel to assess energy–saving opportunities, install efficiency measures and evaluate savings over time.

In addition to savings in the end use of electricity, this plan calls for acquiring all cost–effective efficiency improvements in existing generating facilities, as well as in the transmission and distribution of electricity. Many generating plants can be modified to get more energy for a given amount of fuel burned or water passed through the turbines. Transmission and distribution systems also can be modified to reduce energy losses. These actions are expected to provide about 260 megawatts by the end of this decade.

Generating Resources

In most forecast scenarios, efficiency improvements cannot provide all the energy needed by the turn of the century. To meet this challenge, the plan calls for the development of the least expensive and most environmentally sound hydropower and cogeneration facilities.

Hydropower

The Council recommends that Bonneville and the region's utilities begin the process of acquiring hydropower by siting, licensing and designing facilities at the most cost–effective sites in the Northwest. The Council estimates this would yield about 150 megawatts by 2000. These new hydropower projects must comply with the protected area requirements of the Council's Columbia River Basin Fish and Wildlife Program and with the Council's hydropower acquisition criteria. (See Volume II, Chapter 11.)

Cogeneration

The Council recommends that Bonneville and the region's utilities also begin the process of acquiring the most cost–effective and environmentally sound cogeneration resources in the region. Studies conducted by the Council indicate that approximately 650 megawatts of these resources will probably be needed by the year 2000. Because of their significant potential and apparent acceptability to the public, cogeneration resources could be a very important component of future electric power generation.

Cogeneration projects that match their electricity output with industrial heat requirements (known as thermally matched projects) will maximize the efficient use of natural gas or biomass and thus have minimum impacts on the environment. For this reason, the Council prefers such systems.

Resources from Outside the Region

The Council is aware that significant amounts of energy may be available from utility systems surrounding the Pacific Northwest, but it is very difficult to predict the cost and availability of this resource. Nonetheless, we urge Bonneville and this region's utilities to negotiate with utilities outside the region to acquire additional resources that are cost-competitive and compatible with resources in this Action Plan.

In particular, it appears there are significant opportunities for interregional power exchanges. These exchanges have the potential of providing energy to the Northwest during the times of year when this region needs it most, and capacity to the Southwest when it is most valuable to that region. Possible changes in the operation of the Northwest's hydropower system as a result of needs for fish flows or the system operations review, being carried out by Bonneville, the U.S. Army Corps of Engineers and the Bureau of Reclamation, may create more opportunities for advantageous exchanges.

To the extent these seasonal exchanges can be negotiated, additional firm (guaranteed) energy could be available to the Pacific Northwest without the construction of new generating resources. No specific amounts of this resource have been included in the Action Plan, but they will be taken into account as contracts are signed. Access to transmission will be key to facilitating these exchanges.

On-Site Renewables

The Council looked at a number of on-site applications of renewable energy that can effectively displace electric loads. These applications, such as solar photovoltaics, passive solar heating, and solar and geothermal water heating, can be cost-effective in particular locations.

The Council recommends that Bonneville and the utilities acquire the cost-effective on-site applications of renewable energy that are available to the region. In addition, state and local governments should adopt solar access ordinances to preserve this resource for the future.

We have not identified precise amounts of on-site renewable resources in this Action Plan because of their site-specific nature, the difficulty in predicting their availability, and the fact that they are not likely to be available in large amounts. Instead, we will incorporate their impact in future electric load forecasts.

Acquire These Resources Now

Resources	Megawatts	
Conservation Resources:		
New Residential	70	
New Commercial	160	
Water Heat	185	
Manufactured Housing	55	
Industrial	235	
Existing Commercial	275	
Existing Residential	185	
Irrigation	15	
System Efficiency Improvements	335	
Total Conservation Megawatts		**1,515**
Generating Resources:		
Low-Cost Hydropower	150	
Low-Cost Cogeneration	650	
Total Generating Megawatts		**800**
Total Acquisition Megawatts		**2,315**

Exhibit K11a

Alberta and Southern Gas Co. Ltd.

2900, 240 Fourth Avenue S.W.
Calgary, Alberta, Canada T2P 4H7
Phone (403) 691-7500 Fax (403) 691-7464

July 6, 1992

RECEIVED

JUL 07 1992

D. Tipton

U.S. Generating Company
7475 Wisconsin Avenue
Bethesda, Maryland
20814-3422

Attn: **Mr. D. G. Tipton,**
Manager, Natural Gas Procurement

Dear Sir:

RE: Hermiston, Oregon Cogen - POTENTIAL GAS SUPPLY

Alberta and Southern Gas Co. Ltd. (A&S) hereby submits a sincere letter of interest to supply natural gas to U.S. Generating Company (Generating Company), for it's proposed Hermiston, Oregon Cogeneration Project, as described in your letter of May 29, 1992 to Mr. D. E. Gibson of Pacific Gas & Electric (PG&E).

As you know, for over 30 years, A&S has been one of the largest Canadian aggregators and exporters of natural gas. Enclosed is a company profile which outlines our traditional role, and it's significance. Restructuring in the California marketplace, coupled with the continued strength of our contracted gas supplies, is causing us to prepare for a transition to more diversified markets. Today we have over 8 TCF of supply contracted to us, with deliverability exceeding existing market (potentially declining) requirements by some 800 mmcf/d (23,000 10^3m^3/day). Our supply was recently extended for 15 years, to support the extension of our export license to 2005. Thus we represent one of the largest, and reputed to be one of the highest quality, available pools of aggregated gas supply in North America. A&S is 100% owned by Pacific Gas and Electric Company (PG&E), one of the largest U.S. gas and electric utilities.

A&S is interested in supplying the ***entire requirements*** of natural gas for the Hermiston Cogen Project, described as a 230 MW must-run facility, under the general terms as outlined in your May 29 letter and as further indicated below:

1. Volume:

   Entire project requirements, equivalent to a Daily Contract Quantity (DCQ) of approximately 45,000 mcf at the point of delivery.

2. **Term:**

At least 15 years from commencement. Commencement anticipated to be January 1, 1996 (commercial startup) with startup testing beginning in November, 1995.

3. **Point of Delivery:**

Interconnection of Alberta Natural Gas (ANG) and Pacific Gas Transmission (PGT) facilities at the Canadian/U.S. border near Kingsgate, British Columbia. Alternatively, point of delivery could be the point on PGT near Stanfield, Oregon where deliveries would be made into the spur line to the Hermiston facility.

4. **Load Factor:**

Project load factor, expected to be between 85 and 90 % of DCQ, as an annual average. A deficiency fee (as described below) would be applicable if actual annual volumes consumed were less than 80% of the daily Contract Demand times 365.

5. **Price:**

Pricing would be on a demand/commodity basis, with the demand component including fixed transportation charges on the pipelines utilized upstream of the point of delivery, and the commodity costs including a commodity cost of gas as well as variable transportation costs incurred (again) upstream of the point of delivery. In addition, a deficiency charge would be applicable if annual consumption was below a defined minimum level.

Commodity Gas Price:

Variable Transportation Charges:

Variable transportation charges, assessed on actual gas volumes transported, on pipelines upstream of the point of delivery, being Nova, ANG, and potentially PGT.

Demand Charge:

A fixed monthly charge equal to the then current and applicable Nova firm service *receipt point* demand charge times 120% (recognizing the diversity appropriate to assuring supply) of the DCQ, plus *delivery point* demand charge times 100% of DCQ. (DCQ as used here includes peak transportation fuel requirements.) Similarly the demand charge would include then current and applicable fixed monthly charges on downstream pipelines where A&S holds the transportation (eg. Alberta Natural Gas (ANG) and, if applicable, PGT) applied to 100% of the DCQ.

Deficiency Fee:

6. Supply Commitment:

A&S would commit to maintain a satisfactory reserves to production (R/P) ratio, for all markets served by the pool of reserves serving the Generating Company Hermiston contract. The pool of reserves serving the Hermiston contract could be the entire pool of reserves contracted to A&S, or some subset of those supplies. Since the Hermiston DCQ would represent a small proportion of the total capability of the A&S supply pool, back-up gas supply would readily be available.

A&S will work with Generating Company to put in place necessary arrangements to support financing, due to the unique circumstances surrounding the restructuring of the A&S/PGT/PG&E contracts. Such arrangements such might consist of supply or financial commitments directly linked to the producers who would be in the pool supplying the Hermiston contract, or alternatives.

7. **Transportation:**

A&S currently holds receipt point transportation on Nova and Westcoast, matching the deliverability of it's existing supply (which significantly exceeds requirements of existing markets). We would ***retain, or contract for***, firm Nova delivery capacity at A/BC to match the Hermiston DCQ, as well as ANG capacity, and, if appropriate, PGT capacity. Generating Company would guarantee Nova delivery point and other downstream pipeline demand charges for 100% of the DCQ, and Nova Receipt Point demand charges for 120% of the DCQ (recognizing the diversity appropriate to assuring supply).

A&S desires access to any PGT transportation that may be unused from time to time. To this extent we would be prepared to hold the PGT transportation contract, with Generating Company guaranteeing demand charges for 100% of DCQ from commercial startup. A&S would be willing to at least share the risk of unutilized demand charges from the time of acquisition of the PGT and related capacity, until commercial startup, with the intention of serving short term markets in the interim. Alternatively, if Generating Company prefers to hold the PGT contract, we would propose an arrangement whereby we could access unutilized capacity.

9. **Conditions:**

(1) The sales arrangement would be subject to approval by our producers under the regulations of the Alberta and B.C. Governments affecting netback pricing. This condition could be waived at the sole option of A&S, who could elect to supply the Hermiston Cogen Project requirements from any portion or segment of it's current or future contracted gas supplies, provided all commitments (eg. R/P ratio) continue to be adhered to.

For further discussion and clarification, please contact the undersigned at (403) 691-7621, telecopier # (403) 691-7615. It is our intention that this letter be considered an indication of our serious interest (and appropriateness) to supply the Hermiston Cogen, while remaining open to considering modifications that might be required by Generating Company to meet the needs of the Project. We look forward to working with you.

Yours truly,
ALBERTA AND SOUTHERN GAS CO. LTD.

Paul M. Amirault
Manager, Market Development

cc: R.S. Kupin

pa/Hermiston
enclosures

Alberta and Southern Gas Co. Ltd.

2900, 240 Fourth Avenue S.W.
Calgary, Alberta, Canada T2P 4L7
Phone (403) 691-7500 Fax (403) 691-7464

ALBERTA AND SOUTHERN GAS CO. LTD.

2900, 240 Fourth Avenue S.W.
CALGARY, ALBERTA
T2P 4L7

February, 1992

Alberta and Southern Gas Co. Ltd.
Company Profile

Alberta and Southern Gas Co. Ltd. (A&S) is incorporated in Alberta, has its head office in Calgary, and is owned 100% by Pacific Gas and Electric Company (PG&E) of San Francisco.

A&S is the largest Canadian natural gas exporter, and its primary market is northern and central California, served through a long-term gas sale contract with Pacific Gas Transmission Company (PGT) for resale to PG&E. A&S exports commenced in December 1961 and occur near Kingsgate, British Columbia pursuant to authorizations issued by the National Energy Board. A&S currently holds Licences GL-99 and GL-111, which allow for exports of 1023 MMcf/day or 373.5 BCF/year until October 31, 2005. Recent actual versus authorized export volumes is shown on Attachment #1.

Attachment #2 shows annual revenue from Canadian natural gas exports for the period of 1979 to 1990 and the contribution from A&S's sales to that revenue.

A&S currently purchases gas from about 190 producer companies under approximately 517 gas purchase contracts. Gas purchases are made primarily in Alberta, although since 1989, A&S has been purchasing some of its volumes in British Columbia. A&S, in order to remove gas from Alberta and British Columbia must hold provincial removal authorizations. A&S currently holds an Alberta removal permit which terminates October 31, 2000, and two British Columbia energy removal certificates, one terminates on May 31, 2004, the other on October 31, 2004.

A&S currently has 8.2 TCF of reserves under contract.

In addition to its export sale, A&S also sells natural gas to smaller domestic markets including, local gas utility companies, industrial users, small towns and farm taps.

HISTORY

In the 1950's PG&E, the San Francisco based public utility supplying electric and natural gas service throughout northern and central California, required a source of natural gas in addition to El Paso Natural Gas, whose supply came from Texas and New Mexico, and California production. PG&E considered Alberta as this alternate gas supply source.

To acquire this gas supply and move it from Alberta to California involved construction of a complete new pipeline facility. A series of companies was formed to complete and operate with various aspects of this project. These companies include: PGT, Alberta Natural Gas Company Ltd, and A&S.

PGT is the interstate pipeline company which built, owns, and operates the pipeline between Malin, near the California/Oregon border, and Kingsgate, B.C. (see Attachment #3). PGT was about 50% owned by PG&E and remainder publicly owned. (During 1986 PG&E purchased all publicly owned shares of PGT).

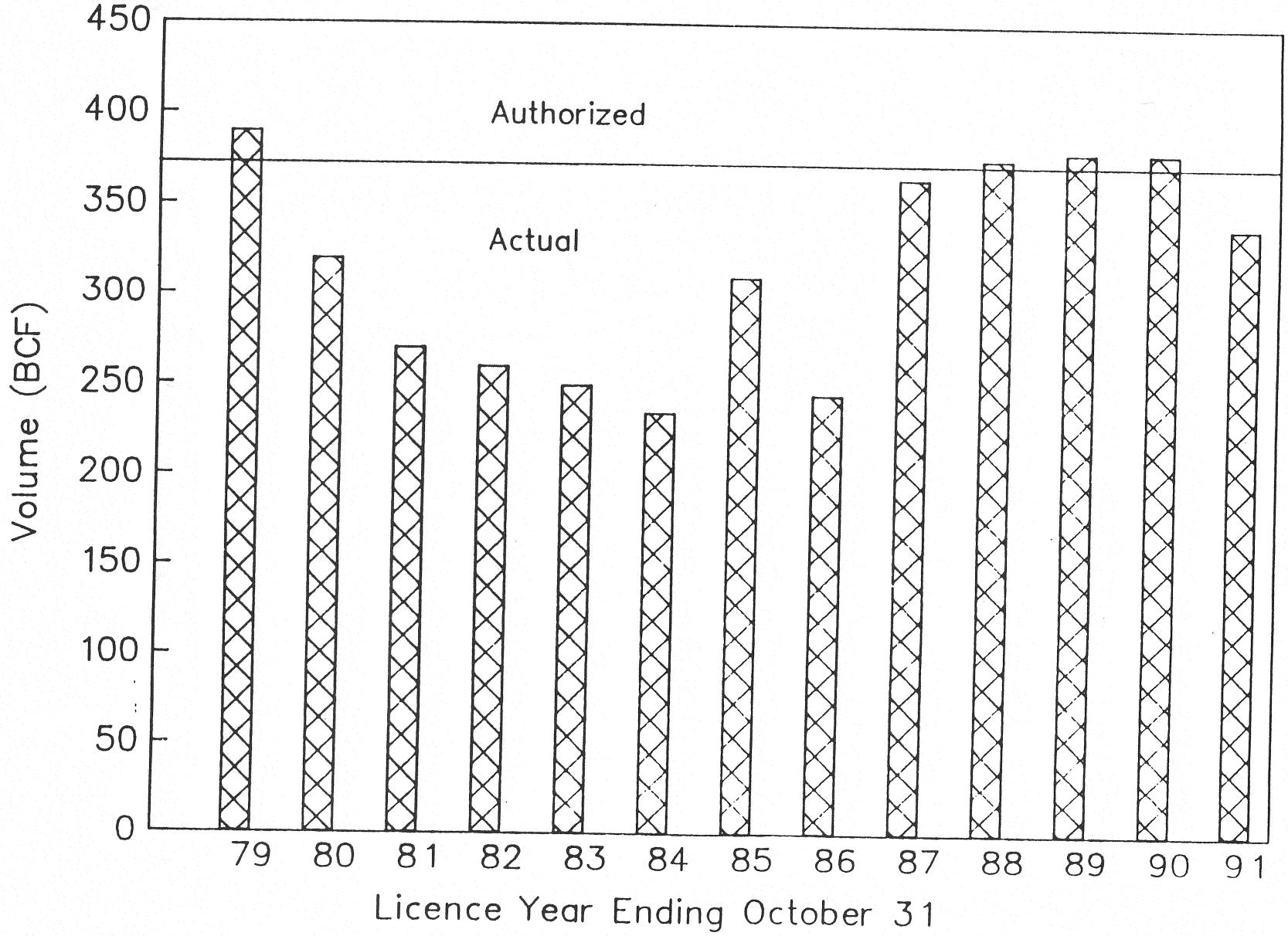
In Canada, ANG was established to build, own and operate the pipeline between Kingsgate, B.C. and Coleman, Alberta. ANG is owned 49% by PGT and 51% by public shareholders.

A&S was established as a wholly owned subsidiary of PG&E. Its primary functions include (1) to acquire the required Canadian natural gas supply, (2) to obtain and maintain the necessary regulatory authorizations to remove gas from Alberta and to export gas from Canada, and (3) to arrange transportation from the point of purchase to the export point.

The corporate relationships for the series of companies mentioned are shown on Attachment #4.

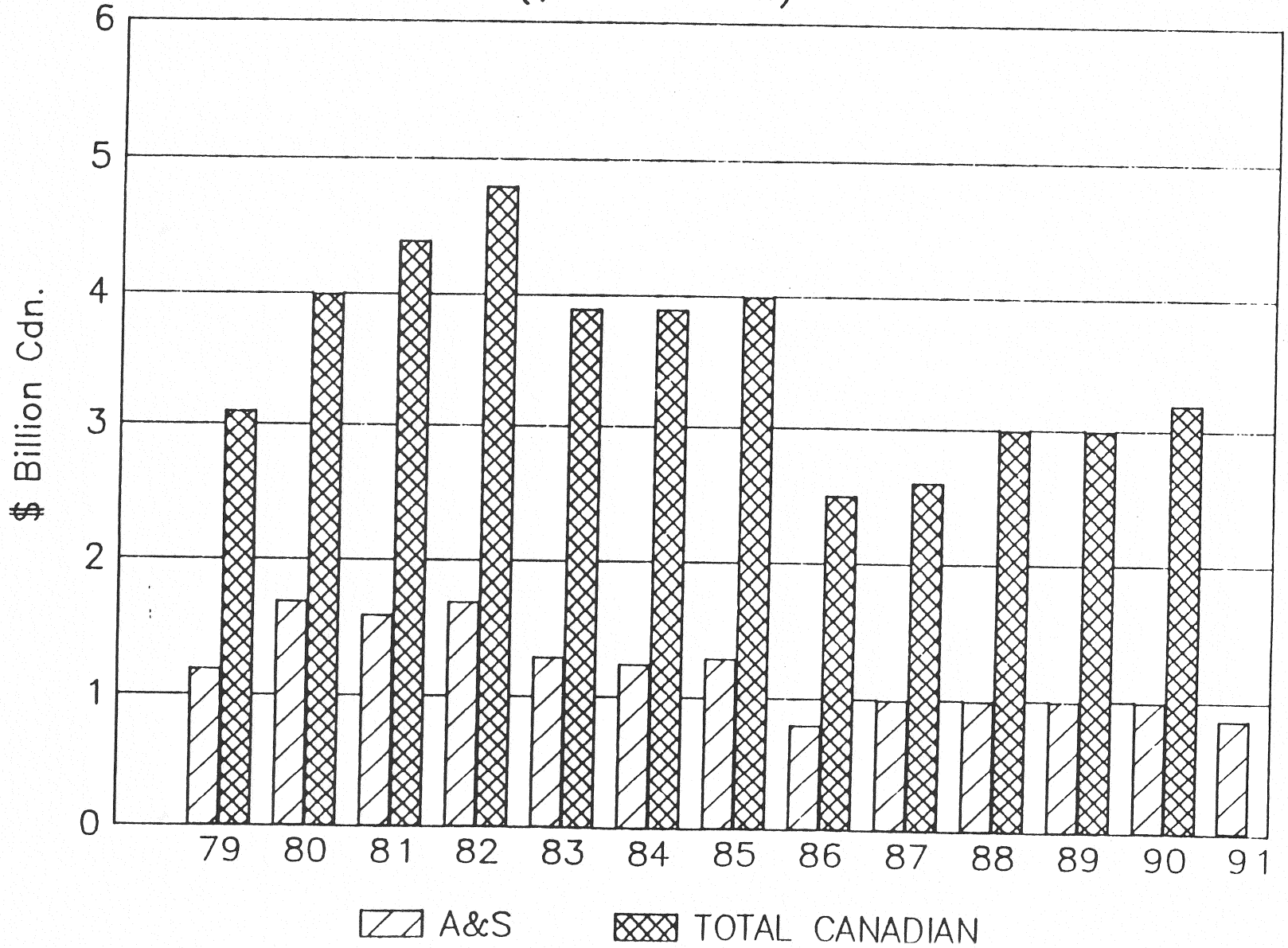
Attachment #1

A&S HISTORICAL EXPORTS



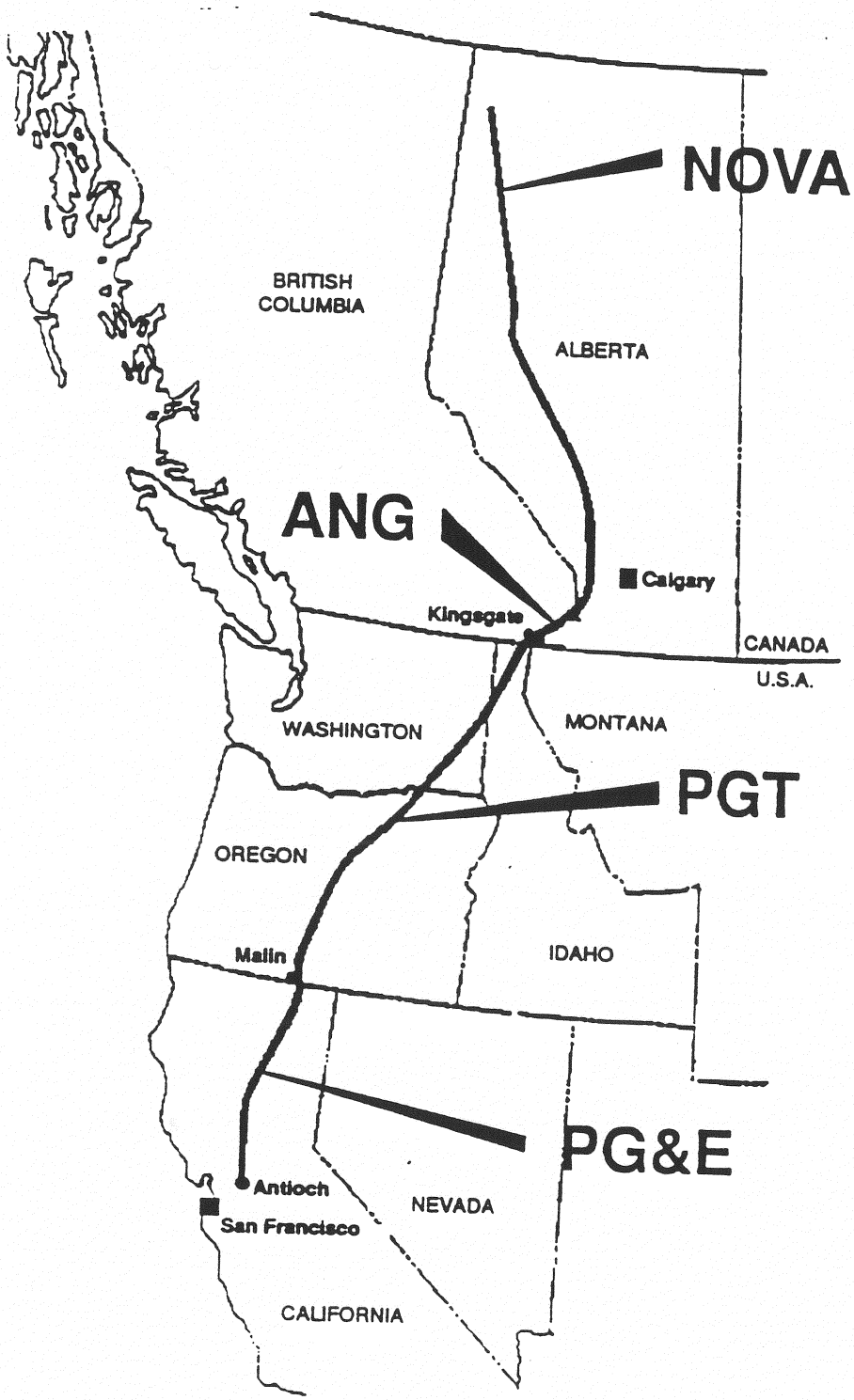
Attachment #2

HISTORICAL EXPORT REVENUES
($ Billion Cdn.)

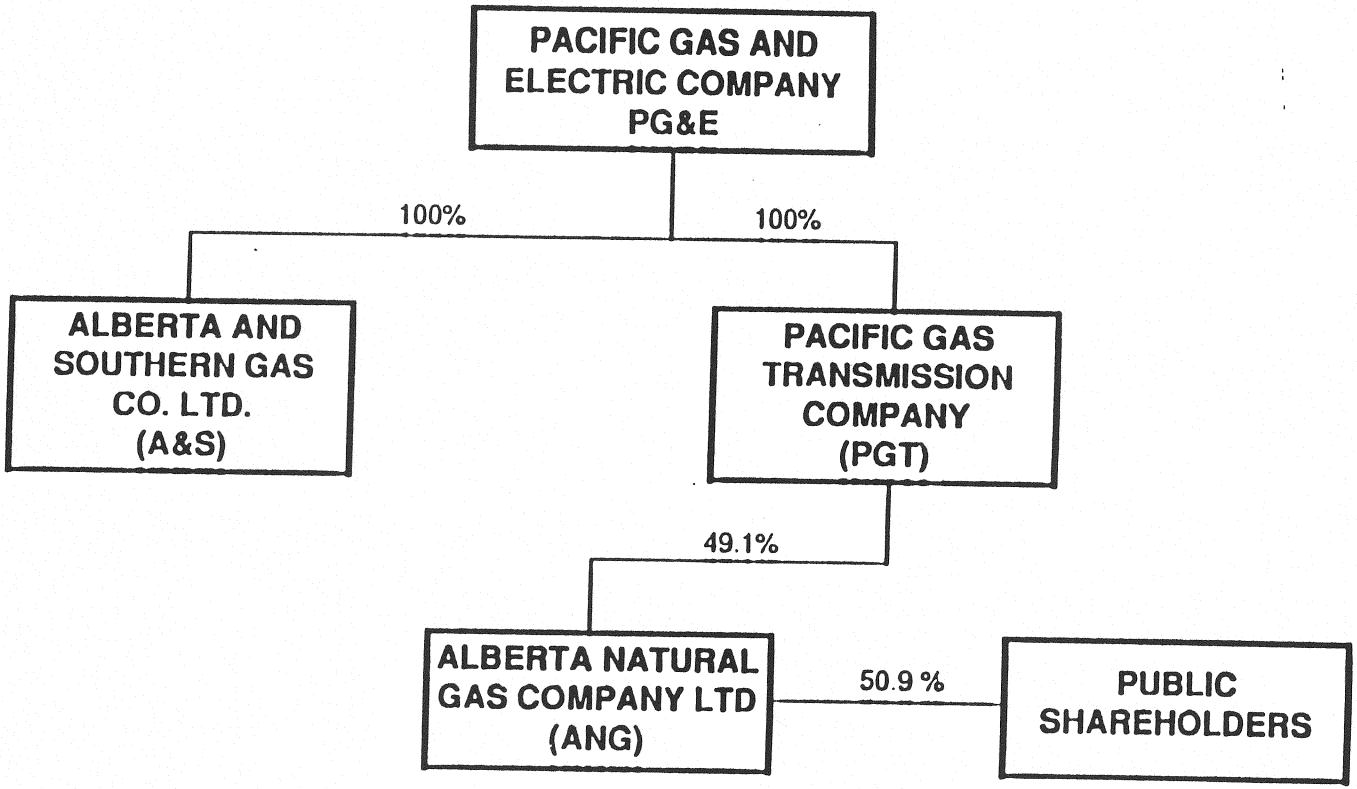


Alberta - California Pipeline System

NOVA CORPORATION OF ALBERTA
ALBERTA NATURAL GAS COMPANY LTD
PACIFIC GAS TRANSMISSION COMPANY
PACIFIC GAS AND ELECTRIC COMPANY



SIGNIFICANT CORPORATE RELATIONSHIPS OF ALBERTA AND SOUTHERN GAS CO. LTD.



SIGCORE 91/08/19

Attachment #4

Exhibit K12a

PGT

Pacific Gas Transmission Company

Eric Eisenman
Manager, Marketing and Transportation

October 16, 1992

Mr. Dan G. Tipton
Director, Fuel Procurement
U.S. Generating Company
7475 Wisconsin Avenue
Suite 1000
Bethesda, Maryland 20814-3422

Dear Dan:

Based on our ongoing discussions, Pacific Gas Transmission Company (PGT) would like to confirm to you its interest in providing firm, long-term transportation service to U.S. Generating Company's (GENCO) proposed Hermiston cogeneration project (HERMISTON), to be sited in Hermiston, Oregon.

Our understanding is that Hermiston will require approximately 45 MMcf/d of firm gas transportation service on PGT from Kingsgate, British Columbia to the plant which is a 220 MW cogeneration project with an anticipated commercial operation date of late 1995 to early 1996.

As you know, PGT is currently in the process of doubling the size of its existing facilities by building a second 42-inch diameter line parallel to our existing line. Thus, additional expansions to serve more customers can be accomplished largely through the addition of compressors as well as facilities to tie the customer in with our existing facilities. Therefore, PGT is very interested in potential firm customers in the Pacific Northwest where it can be demonstrated that the customer would have sufficient long-term gas supplies and sufficient end-use requirements to support the requested transportation service.

PGT is satisfied that Hermiston has a secure long-term, competitively priced gas supply. Accordingly, to the extent Hermiston secures a power sales agreement, it will have demonstrated to our satisfaction that the requested transportation service is warranted.

PGT is aware that GENCO is currently negotiating with several entities for the sale of electricity from Hermiston. Please keep in mind that PGT's

160 Spear Street ■ San Francisco, California 94105-1570
415 973-6170 ■ Fax 415 972-7669

transportation service to Hermiston may have to be coordinated with new service to other customers as well as any related regulatory requirements or approvals. Therefore, please keep us apprised of your progress in finalizing a power sales contract in order to allow us to respond to your transportation request on a timely basis.

We look forward to working with you. If you have any questions or need any further information, please call.

Sincerely,

Eric Eisenman
Manager, Marketing & Transportation

EE/sm

bcc: SPReynolds
PGRosput
PGLund
SRHannigan

M

ONEticket Tab Page

2.2.6.1

U.S. Generating Company

February 23, 1993

Renato C. Dulay
Manager
Industrial and On-Site Waste Section
Water Quality Division
Oregon Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204-1390

Dear Rene,

Please find enclosed two (2) copies of the Application for Water Pollutant Control Facilities Permit (SPCF-N) for the Hermiston Generating Project, along with a check for $4,800 as the application fee. *Cooling Water Reuse Land Application System Management Plan for Hermiston Generating Company,* two copies of which were provided previously under separate cover, constitutes the "Exhibit A" required under part C of this application.

If there are any questions about this application, please feel free to contact me at (415)291-6417 or Roy Skinner at (916)983-7868. I look forward to working with you and the members of your staff on this project.

Sincerely,

Peter B. Evans
Project Developer

Enclosures

444 Market Street, Suite 1900 • San Francisco, California 94111 • 415-291-6481 • Fax 415-291-6498

Printed on recycled paper

LAND USE APPROVALS

The Hermiston Generating Project is an energy facility subject to the Energy Facility Siting Council's (EFSC) site certificate review process. In that process, county jurisdiction is pre-empted by EFSC under ORS 469 and the subsequent opinion of the Attorney General. Attached is a copy of a letter from the Umatilla County Board of Commissioners confirming the deferral of permitting authority to EFSC and indicating that a Conditional Use Permit will not be required for the project. A land use compatibility statement has, therefore, not been prepared. Land use compatibility of the project will be considered by EFSC under OAR 345-22-030.

RECEIVED

JUL 09 1992

DEPARTMENT OF ENERGY

UMATILLA COUNTY BOARD OF COMMISSIONERS

Courthouse, 216 S. E. 4th, Pendleton, Oregon 97801 • Telephone: 503-276-7111

Bill Hansell, Glenn Youngman, Emile Holeman
COMMISSIONERS

Jacki Haggerty-Foster
LEGAL COUNSEL

Marcia Wells
OFFICE MANAGER

Bob Small
PERSONNEL DIRECTOR

July 2, 1992

Sandra R. Muckelston
Department of Energy
625 Marion Street NE
Salem, OR 97310

Dear Ms. Muckelston:

Thank you for the opportunity to respond to the Notice of Intent filed by Hermiston Generating Company for a Proposed Cogeneration Energy Facility. Following is a response to the four questions listed in your May 27, 1992 memo.

1. The information in the NOI appears to be accurate. However, Exhibit M, page 8, (M-8), contains a slight misrepresentation of the County's permitting requirements. The County will <u>not</u> require a Conditional Use Permit, but will instead recommend to the Energy Facility Siting Council adoption of Development Ordinance Sections identified in item 2 below. (Note: the County defers permitting authority to the Oregon Department of Energy's Energy Facility Siting Council (EFSC) pursuant to ORS 469 and subsequent opinion by the Attorney General of the "one-stop permitting" process.)

2. As written in the NOI, the proposed project site is located in a Light Industrial Zone, which identifies a utility facility as a conditional use (Section 3.184). The Board of Commissioners recommends the Council consider for adoption the following Development Ordinance Sections: 3.184, 3.185, 3.186, 3.187, 3.188 of the Light Industrial zone, and, from the chapter on Conditional Use requirements, Section 7.060(55) items (a) thru (j). A copy of those Sections is enclosed.

3. Umatilla County encourages the Council to consider measures to protect surrounding natural resources and to mitigate against possible negative environmental, social, or economic impacts.

4. Dennis Olson, Planning Director, will be in charge of the review of the application for a site certificate for the proposed energy facility.

We appreciate your consideration of County recommendations and especially for meeting with us to discuss the project.

Sincerely,

Umatilla County Board of Commissioners

Glenn Youngman

Glenn Youngman

Emile M. Holeman

Emile M. Holeman

William S. Hansell

William S. Hansell

OTHER PERMITS

Under Oregon law, embodied in ORS Chapter 469, the Hermiston Project is subject to a "one stop" siting process. Through the "one stop" siting process, particularly as explained in a recent Oregon Attorney General's Opinion (November 4, 1991), it is important that potential issues relating to permits which Hermiston Generating Company, L.P. must obtain from other agencies be resolved in the context of the EFSC proceedings. Exceptions to this are federally-delegated programs implemented by the Oregon Department of Environmental Quality. For the Hermiston Project, these include the Air Contaminant Discharge Permit, Stormwater Discharge Permit, and Hazardous Waste Generator Registration.

The following discussion addresses state and local requirements for the Project.

State Permit Requirements

Agency:	**Department of Energy–Energy Facility Siting Council (EFSC)** 625 Marion Street NE Salem, OR 97310 (503)378-6469
Permit:	Site Certification
Agency:	**Department of Environmental Quality(DEQ)–Hazardous and Solid Waste Division** 811 SW Sixth Avenue Portland, OR 97204 (503)229-5913
Permit:	Hazardous Waste Generator Registration
Discussion:	Hermiston Generating Company will register and obtain a generator identification number before generating hazardous waste in the operation of the energy facility.

Agency: **Division**	**Department of Environmental Quality(DEQ)–Air Quality** 811 SW Sixth Ave Portland, OR 97204 (503)229-5359
Permit:	Air Contaminant Discharge Permit (ACDP)
Discussion:	Air Quality permitting requires acquisition of an Air Contaminant Discharge Permit. A copy of the application submitted to DEQ is included in Exhibit M.
Agency:	**DEQ–Water Quality Central Division** 811 SW Sixth Ave Portland, OR 97204 (503)229-5279
Permits:	Water Pollution Control Facilities (WPCF) Permit General Stormwater Discharge Permit for Construction Activities
Discussion:	A Water Pollution Control Facility (WPCF) permit will be required for discharge of wastewater. The power plant is anticipated to have a daily discharge of 1.0 million gallons. The project will utilize land application (crop irrigation) for disposal of effluent from the facility. A General Stormwater Discharge Permit for Construction is required to address erosion control for construction activity. Copies of the applications for both permits are included in Exhibit M.
Agency:	**Building Codes Agency** 1535 Edgewater NW Salem, OR 97310 (503)378-4133 700 SE Emigrant St. Pendleton, OR 97801 (503)276-7814

Permits:

Plumbing
Structural/Mechanical/Energy
Elevator
Fire Marshall
Electrical
Pressure Vessel (Boiler)

Discussion:

The power plant will be subjected to a rigorous structural and safety permitting process by the Oregon Building Codes Agency. The purpose of this process is to ensure adequate facility design for operational safety. Review by the Building Codes Agency would include structural, electrical, mechanical, plumbing and safety. Design review and issuance of the necessary permits would be conducted through the Salem Office of the Building Codes Agency. The result of this review would be issuance of building permits, electrical permits and other plant operational component permits. The local office, in Pendleton, would be responsible for construction inspection of the facility during and upon completion of construction. All other permits for facility construction and operation must be obtained before any permits to begin construction are issued.

Agency:

Department of Transportation—Highway Division, Region 5, District 12
Region 5 Office
3012 Island Ave
LaGrande, OR 97850
(503)963-3177

District 12 Office
104 SE 12th St.
P.O. Box 459
Pendleton, OR 97801
(503)276-1241

Permits:
Highway

Permit for Performing Miscellaneous Operations upon a State

Access Permit

Discussion: The State Department of Transportation will require filing of an Application for Performing Miscellaneous Operations upon a State Highway for any state roads or highways crossed by pipelines or power transmission structures associated with the proposed power plant. The guidelines for such crossing would be as defined in Oregon Administrative Rule, Chapter 734, Division 55, Highway Division. These guidelines would be part of the permit and any additional conditions placed upon the action would be attached to the face of the permit. The Department of Transportation would review and require any special crossing conditions based on design, crossing method, and other factors related to roadway stability. Any access either temporary or permanent from state highways would require acquisition of an access permit.

Local Permit Requirements

Agency: **Umatilla County–Public Works Department**
216 SE 4th
Pendleton, OR 98701
(503)276-7111

Permits: Utility Permit
Access Permit

Discussion: Crossing of County roadways by pipelines or transmission line facilities will require acquisition of a Utility Permit. This requirement would also apply to any other "utilities" such as water supply pipelines. A permit would be required for each crossing point.

An Access Permit will be required by the County for any temporary or permanent construction or modification to existing or previously permitted access points. This process also includes review and potential requirement of yield/stop sign placement and culvert requirements.

Movement of oversize loads on public roadways is a joint permit between the State and the County. The State Department of Transportation issues the permit after incorporating any County agency concerns or conditions.

Agency:	**City of Umatilla–Planning Commission** P.O. Box 130 Umatilla, OR 97882 (503)922-3226
Permit:	Conditional Land Use Permit
Discussion:	A portion of the electrical transmission line that will be upgraded for the project is located within the City Limits of Umatilla. A Conditional Use Permit will be required for upgrading this portion of the line to ensure compliance with local zoning and land use requirements.

'ETURN APPLICATION TO:

DEPARTMENT OF ENVIRONMENTAL QUALITY
Business Office
811 S.W. Sixth Avenue
Portland, OR 97204
(503) 229-5269

APPLICATION FOR WATER POLLUTANT CONTROL FACILITIES PERMIT (WPCF-N)

STATE OF OREGON

DEQ USE ONLY

Appl. No.: _____

File No.: _____

Received: _____

A. REFERENCE INFORMATION

1. Hermiston Generating Company, L.P.
Official Name of Applicant (Owner)

Division Identification

2. 444 Market Street, 19 Floor
Mailing Address

San Francisco — City
CA — State
94111 — Zip

3. Peter B. Evans
Responsible Official

Project Developer
Title

same as above — Address or Location
415-291-6417 — Phone

4. Plant Location if different from Mailing Address:
705 Westland Road
Hermiston, OR 97838

5. Enter Site Location by Latitude and Longitude:

LATITUDE			LONGITUDE		
1. Deg.	2. Min.	3. Sec.	1. Deg.	2. Min.	3. Sec.

6. Kent L. Fickett
Alternate Responsible Official

Director, Regulatory Affairs
Title

7475 Wisconsin Ave., 10 Floor
Bethesda, MD 20814 — Address or Location
301-718-6860 — Phone

B. GENERAL DESCRIPTION OF FACILITY

Briefly summarize the proposed facility and primary method of waste treatment and disposal.

Cogeneration power plant

Cooling tower blowdown to be disposed of via land application

C. REQUIRED EXHIBIT

As EXHIBIT A, attach two (2) copies of a Preliminary Engineering Report or Facility Plan Report which fully describes the proposed project, using written discussion, maps, diagrams, and any other necessary materials. Specific items contained in the report should include:

1. A complete description of the proposal.
2. The location of the project and adjacent facilities and waterways.
3. Schedule for development.
4. Schematic diagrams of industrial processes, waste streams, and treatment and disposal facilities.
5. Disposal of solid waste and sludges.
6. Groundwater information.
7. Evaluation of groundwater and surface water impacts.

D. LAND USE APPROVAL

LAND USE COMPATIBILITY STATEMENT: is attached ☐ is coming ☐ N/A ☒

E. OTHER PERMITS

Attach a list of other permits issued or applied for.

F. FEES — MUST ACCOMPANY THIS APPLICATION

Filing Fee	$ 50
Processing Fee	4,000
Compliance Determination Fee	750
TOTAL	$ 4,800

I HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THIS APPLICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

Signature of Owner (Or Legally Authorized Representative)

Vice President — Title

2/23/93 — Date

INSTRUCTIONS
FOR
FILING FOR NEW WATER POLLUTION CONTROL FACILITIES PERMIT

A. REFERENCE INFORMATION

1. Enter the applicant's official or legal name. Do not use a colloquial name. If a partnership, list each partner.
2. Enter the mailing address where the permit and related correspondence should go.
3. Give the name of the responsible official we should contact if we have questions about the application or the facility.
4. Enter the address of the proposed facility if different from the mailing address in 2.
5. Enter site location by latitude and longitude.
6. List an alternate to the official name in 3.

B. GENERAL DESCRIPTION OF FACILITY:

Please enter a general description of the proposed facility and the primary method of handling wastewaters.

Examples:

1. 2 MGD Domestic Sewage Treatment Plant consisting of non-overflow, evaporative lagoons.
2. Seasonal jam and jelly processing facility with land irrigation of process wastewater.

C. REQUIRED EXHIBIT:

> ***NOTE:***
> **These exhibits are the most important part of the application. Failure to provide required exhibits and information will delay processing the application and final action.**

1. A facility description should include all aspects of the proposed facility including all products to be manufactured, services to be rendered, or activities to be conducted.
2. A facility description should include a map which not only shows the location and expanse of the project but also the location of adjacent waterways, drainage ways, residential areas and industrial or commercial facilities. Please locate project by Township, Range, and 1/4 — 1/4 section.
3. The proposed development and construction schedule should be as complete and accurate as possible. This should include future expansion plans or potential.
4. Schematics should include each industrial process, each waste stream (including a water balance), treatment and control facilities, and ultimate disposal means of each waste product or effluent. Alternatives for treatment, if being considered, should also be included. Where possible, the quantity and quality of each waste stream should be noted.
5. The collection, storage and disposal of sludges should be addressed, including volume and quality where possible.
6. Groundwater information must be provided for all areas where wastewater or sludge will be stored or disposed. The following minimum information is required: (In areas of shallow, unprotected aquifers or other areas with high potential for groundwater contamination, additional information may be required.)
   a. Climatic information.
   b. Topography and soils profile.
   c. Flooding and erosion potential.
   d. Groundwater aquifer characteristics, including quality and gradient.
   e. Location of all wells and springs within 1/2-mile radius.
7. Provide information detailing steps to be taken in protecting surface and groundwaters during construction and operation of the facility.

D. LAND USE APPROVAL:

The Department will not process a permit application without evidence provided that the proposal is approved by local land use planning agencies and meets statewide planning goals. The attached compatibility statement may be used for that evidence.

E. OTHER PERMITS:

In order for the Department to coordinate with other agencies and other Divisions within the agency, it is important to provide information regarding the status of other applications or permits.

F. FEES:

Appropriate fees must accompany every application. Please see attached fee schedule.

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Wetlands

There were three wet areas on or near the transmission line corridor (Figure H-1). Two of these features are man-made. One site is adjacent to the corridor, but outside the proposed disturbance area. It is a flat area which has been used for years for land application of potato processing wastewater. Water is retained in depressions and the wastewater supports a dense algal community. Weedy introduced species dominate this area.

The second site is a small wetland at the foot of the slope between the West Extension Irrigation Canal and the Umatilla River. This wetland appears to be fed by irrigation water. It is dominated by cattail, water speedwell, watercress, and rabbitfoot polypogon. There are also some willow and cottonwood saplings.

The third site is the riparian corridor along the Umatilla River. Trees along the banks include box elder, black locust, and Russian olive. Common shrubs include willow and Himalayan blackberry. Along the waterline and in the shallows are reed canarygrass, bulrush, and cattail.

Impacts and Mitigation

Project impacts on native vegetation will be minimal. Native vegetation that does occur in the project area is sparse, except for that within the Umatilla Ordnance Depot.. Disturbance will be limited to pole replacement activities along the right-of-way associated with upgrading the existing transmission line. In most cases, native vegetation can be avoided by construction activities. The Project will not affect the native vegetation within the Umatilla Ordnance Depot.

Revegetation Emphasizing Native Species -- Project Order Addendum 2 Paragraph II.G.3

Areas disturbed by construction of the power plant, gas pipeline and transmission line will be revegetated upon completion of construction. Revegetation will emphasize the use of native species where appropriate, as determined through consultation with the Oregon Department of Agriculture and the Oregon Department of Fish and Wildlife.

SOILS

Table N-2 identifies the soils at the energy facility site and along electrical transmission line and gas pipeline routes as well as the extent of disturbance resulting from the Project. Along the transmission line route, the disturbance will primarily be at the power pole replacement locations.

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EXHIBIT O

WATER RESOURCES - OAR 345-21-015(1)(o)

INTRODUCTION

As described in Exhibit F, the Project's projected water requirement is approximately 5.8 cfs (2,600 gpm). The water supply for the project is the Port of Umatilla's water supply system. This system is described in more detail below. Under the Port's permit, water may be supplied to the project site for municipal purposes, which includes industrial purposes. This is a valid permit, and no action by the Oregon Water Resources Department ("WRD") is required for water to be used for power production at the project site under the terms of this permit. Accordingly, no application for a new water right or a water right transfer is filed with this ASC.

Water discharges are addressed in Exhibits B and M. As described therein, Madison Farms will beneficially use cooling water from the Project for irrigation. Exhibit M contains the Land Application Management Plan and WPCF permit for this beneficial reuse. Madison Farms will also file a water right application for use of this cooling water for irrigation purposes, pursuant to ORS Chapter 537, Section 110 through 330 and OAR 690-11-005 through 690-11-220.

Port of Umatilla Water Supply System

The Port of Umatilla holds permit No. 49497 for the use of up to 155 cfs of water from the Columbia River, an amount well in excess of the Project's requirements. This permit has a priority date of January 19, 1979, an the deadline date to complete work under the permit has been extended to October 1, 1997. Under this alternative, the Port or Umatilla would supply water to

Applicant under its permit, which was acquired to support development of several industrial areas, including the area in which the Project is located. The Port of Umatilla's permit, which is for municipal use, includes the energy facility site, Section 30, Township 4 North, Range 28 East, W.M. The point of diversion for water under this permit is in Section 10, Township 5 North, Range 28 East, W.M. Hermiston Generating Company would purchase water from the Port; the Port, as seller, would continue to hold the water right.

The Port of Umatilla is proposing a municipal and industrial supply system that would serve the City of Hermiston as well as industrial users in west Umatilla County. The Port has selected an engineering contractor, and is proceeding with design work for a system that should be operational in early 1994. This system will be designed initially to serve the City of Hermiston and several other industrial customers, and to provide service to the Port's industrial properties and other properties near the intersection of Interstate Highways 82 and 84, directly adjacent to the energy facility site. As envisioned, this system would deliver water to the Hermiston Generating Project at the site boundary.

No further action by WRD would be required for the Hermiston Project to obtain water from the Port.

Alternative Supplies Under Consideration --
Project Order Addendum 2 Paragraph 2.A.2

No alternative water supplies other than the Port of Umatilla are presently under active consideration as water sources for the project. Thus, no permit applications for alternative water supplies are provided in this ASC.

Proposed Action by Applicant if Water Rights are not Acted on by WRD--
Project Order Addendum 2 Paragraph 2.A.2

The Project Order requires that Applicant indicate what action Applicant proposes if required water rights are not acted upon by WRD prior to EFSC consideration of the Site Certificate for the Project. With the Port of Umatilla as the Project's water source, no action by WRD is required

to supply water to the Project. As a result, the circumstance described in the Project Order is avoided.

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EXHIBIT P

IMPACTS ON FISH AND WILDLIFE

INTRODUCTION

To satisfy OAR 345-22-060, the EFSC must find that the design, construction and operation of the Project is consistent with fish and wildlife habitat mitigation goals and standards contained in OAR 635-415-030, for fish and wildlife species not classified as threatened or endangered.

This Exhibit identifies non-threatened and endangered fish and wildlife species which have been found in the Impact Area during field surveys. In response to Paragraph 19(ii) of the Project Order, a copy of the biological surveys conducted for the impact area, *Vegetation and Wildlife Investigation, Hermiston Generating Project* and a Technical Memorandum (Woodward-Clyde, 1992 and 1993, respectively), are attached as Appendices P-1 and P-2 to this Exhibit . The only other biological survey conducted within the Impact Area of which Applicant is aware is a report on the 1987-89 research on the distribution of the Washington ground squirrel(Betts, 1990), which is cited in Exhibit R. As described in Exhibit C, the Impact Area for wildlife and wildlife habitat for the Project is the area within the site boundary of the energy facility and within 500 feet on either side of the proposed rights-of-way for the gas pipeline and transmission line.

This exhibit also summarizes the categories of habitats observed within the Impact Area and the OAR 635-415-030 habitat mitigation goals for each habitat category. Finally, this exhibit discusses how design, construction and operation of the Project will be carried out in a manner consistent with the applicable requirements. The extent and nature of direct and indirect impacts

are discussed, along with proposed mitigation. Particular attention is paid to protective measures at transmission towers to reduce the potential for electrocution of raptors.

FIELD SURVEYS

1992 Surveys -- Project Order Paragraph 19(ii)

In 1992 wildlife surveys in the vicinity of the project were conducted by Woodward-Clyde consultants during April and June, 1992. The results of these surveys are included in *Vegetation and Wildlife Investigation, Hermiston Generating Project,* Woodward-Clyde, 1992, a copy of which is attached as Appendix P-1.

Additional Surveys -- Project Order Addendum 2 Paragraph II.D.1

Through discussions with Oregon Department of Fish and Wildlife (ODFW), applicant agreed to conduct multiple surveys during April and May 1993 to determine whether any sensitive species which had not been specifically identified during the 1992 surveys are present in the area of the project facilities, particularly along the gas pipeline route.

Additional wildlife surveys were conducted for the project on April 9, 16, and 26, 1993 as addressed in Woodward-Clyde's Technical Memorandum (see Appendix P-2) and May 9 and 21, 1993. These included detailed surveys along the gas pipeline route, and the portion of the transmission line route in Section 20 where grasshopper sparrows had been observed previously, during the 1992 surveys. These surveys concentrated on the Washington ground squirrel, burrowing owl, and grasshopper sparrow. No evidence of either the Washington ground squirrel or burrowing owl was found during the surveys.

Grasshopper sparrows were again observed in Section 20 along the transmission line route during the April 1993 surveys and near the southern end of the gas pipeline route during the May 1993 surveys.

Preconstruction surveys will be conducted for those species that have been identified during the 1992 and 1993 surveys. This will allow for identification of nests or burrows at the time of construction so that proper avoidance or mitigation can be provided.

FISH AND WILDLIFE SPECIES AND THEIR HABITAT - OAR 345-21-015(1)(p); PROJECT ORDER, PARAGRAPH 19(ii) and (iii)

Fish

Anadromous fish species present in the Umatilla River include several species of salmon and steelhead trout (*Salmo gairdneri*). Steelhead are the only surviving native wild fishery. Hatchery-derived runs of both chinook salmon (*Oncorhynchus tshawytcha*) and coho salmon (*Oncorhynchus kisutch*) are being encouraged to naturally re-populate the basin. Millions of smolt are placed in the Umatilla River, but low flows from irrigation withdrawals often prevent smolt from reaching the Columbia River in the spring, and adults are sometimes prevented from moving up river to spawn when flows are low. The Umatilla Project, a project unrelated to this proposal, is intended to improve low flows so that fish can move upstream and downstream more readily (Germond 1992).

Anadromous fish that pass through the Columbia River by 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. Two wild fish runs were listed by the National Marine Fisheries Service in 1991 and 1992 under the Endangered Species Act. Snake River spring/summer and fall chinook runs were listed as Threatened. Snake River sockeye runs were listed as Endangered.

Wildlife Species

A complete list of all wildlife species observed during field surveys conducted for the Project in 1992 and 1993 to date is included in Table P-1. The most common species observed were the western meadowlark, western kingbird, and long-billed curlew.

Habitat Types and Goals

There are seven basic habitat types within the Impact Area. With the exception of an undisturbed parcel of shrub-grass within the Umatilla Ordnance Depot (see below), none of the habitat within the Impact Area or surrounding region is of exceptional value or unusual.

The structural diversity of these habitats is variable, representing grassland, shrub grass habitats, wetlands, and wooded areas along the Umatilla River and near residences. Below is a description of these habitat types with a brief listing of typical species. Wide-ranging wildlife species such as the coyote, badger, black-tailed jackrabbit, red-tailed hawk, northern harrier, American kestrel, and black-billed magpie occur in all or nearly all of these habitats. Other migratory birds move through the area during fall and spring migration.

Following the description of each habitat type is a discussion of the habitat quality goal classification for that habitat type, as set forth in OAR 635-415-030 (1) through (4). Plant species identified in the area of the Project are listed in Table P-2. This discussion is related to Exhibit N.

Grasslands

Disturbed grasslands dominated by cheatgrass and tarweed predominated in the non-farmed portions of the study area. These grasslands were found at the proposed energy facility site, in large areas south of Interstate 84 in the vicinity of the gas pipeline, and at scattered locations along the existing transmission line. Western meadowlarks, long-billed curlews, ring-necked pheasants, and horned larks are ground-nesting birds that were found in this habitat. Western kingbirds were common along the transmission line corridor, in grassland, pasture, and cropland habitats. They nest on power poles throughout the transmission corridor.

Grassland habitats at the proposed energy facility site fall within Habitat Category 4, described as "habitat of low value to fish and wildlife," owing to its highly disturbed plant species composition and location with a high level of human disturbance. The habitat mitigation goal for this Category is to minimize loss of habitat value, or to conserve or enhance habitat. Habitat enhancement for these areas could include establishment of raptor and western kingbird nest structures along the upgraded transmission line.

Shrub-grass

Shrub-grass habitats included mixtures of the grassland species listed above, along with rabbitbrush and occasional big sagebrush and antelope bitterbrush. Western meadowlarks, long-billed curlews, and ring-necked pheasants are all ground nesting birds that occupied this habitat. One relatively undisturbed shrub-grass habitat area was found in the northern portion of the existing transmission line in Section 20 south and west of the Umatilla River. This area was examined several times during June, 1992, as potential habitat for burrowing owls but none were observed. Grasshopper sparrows were observed there.

Shrub-grass habitat within the Impact Area is categorized as either Habitat Category 2 or Habitat Category 3. Habitat Category 2 is: "habitat of high value for an evaluation species and is scarce or becoming scarce statewide or within the physiographic province; or is habitat essential to achieving policies or population objectives specified in a species management plan of the Fish and Wildlife Commission; or is essential habitat of any sensitive species listed by the Fish and Wildlife Commission." Habitat Category 3 is: "habitat of high to medium value for evaluation species, [which] is abundant statewide or within the physiographic province."

The only area of shrub-grass habitat that potentially falls within Category 2 is the Umatilla Ordnance Depot parcel, which is fenced and lies adjacent to a portion of the transmission line. The mitigation goal for Catagory 2 is no loss of either habitat units or habitat value. Protection from cattle and sheep grazing in the Ordnance Depot has preserved the native shrub-steppe/grassland vegetation that originally occurred in this area, and as such the vegetation is a valuable resource. The depot, however, has not been identified as critical habitat for any listed species, and will not be impacted by the Project.

All other shrub-grass habitat within the Impact Area is classified as Category 3. The mitigation goal is no net loss of either habitat units or habitat value. Grasshopper sparrows and long-billed curlews, both state sensitive species, are relatively common in the area and the habitat along the transmission line and gas pipeline does not appear to be essential to their continued occupancy of the Impact Area, as suitable habitat appears to be abundant. Construction of the transmission line and gas pipeline is not expected to result in a net loss of habitat units or value.

Croplands

Irrigated croplands, primarily potatoes and corn, were found scattered throughout the Impact Area in the vicinity of the gas pipeline and along the existing electric transmission line.

These areas do not provide year-round habitat for wildlife, but several wildlife species used them in June, 1992, notably long-billed curlews and ring-necked pheasants. These areas in fact appeared to be preferred by curlews during the June, 1992, field visit. Curlews had been more frequently observed during the April field visit in grassland and shrub grass habitats, where they apparently nested. It appears, however, that these irrigated croplands may be important foraging habitat for curlews and possibly their young after hatching, based on the June 1992 observations.

Croplands are categorized as Habitat Category 4; of low value owing to their limited value for most species. Habitat Category 4 is described above under Grasslands.

Pastures

Pastures are actually a subset of the Grassland habitat type, and are dominated by introduced plant species. Irrigated and non-irrigated areas occur in the Impact Area. Pastures appear to fit habitat Category 3.

Residential

Scattered residential areas existed in the vicinity of the gas pipeline and adjacent to the existing electric transmission line in its northern extent. These areas supported typical urban species such as the American robin, European starling, house finch, rock dove, and house sparrow.

Residential areas are categorized as Habitat Category 4, which is described above under Grasslands.

Riparian

A narrow band of trees and shrubs lined the banks of the Umatilla River at the site of the existing transmission line crossing. Wildlife species observed in this area included unidentified gulls, Canada geese, unidentified terns, and mallards. Given the small amount of this riparian habitat present, it is very unlikely that yellow-billed cuckoos would occur. The Umatilla River may be occasionally utilized by wintering bald eagles feeding on fish or waterfowl.

This riparian habitat is considered Habitat Category 2, which is described above. Upgrading the electrical transmission line will span the riparian area, but will not result in any long term impact. Temporary disturbance during installation of the replacement poles and wire installation may occur if construction occurs during the nesting season; however, no net loss of habitat units or value of Habitat Category 2 will occur as a result of activity in this area.

Emergent Wetlands

One small emergent wetland, apparently created by irrigation, was found just west of the Umatilla River underneath the existing transmission line in a low spot. It appears to have been created by direct irrigation and possibly by leakage from the west extension irrigation canal. The California quail, red-winged blackbird, and brown-headed cowbird were observed in this vicinity. A second larger wetland which contains standing water and emergent vegetation exists in the northern part of the transmission line and was created by application of potato processing water. This area was occupied by long-billed curlews, American avocets, mallards, green-winged teal, red-winged blackbirds, Brewer's blackbirds, and killdeer. A third emergent wetland was found about 3/4 mile west of the gas pipeline in a low spot in an irrigated pasture next to Jordan Road, south of Interstate-84. Curlews and killdeer were observed there.

All emergent wetland habitat meets the definition of Category 2 (definition above). The upgrade of the electrical transmission line will avoid permanent disturbance of these areas. Temporary disturbance during installation of the replacement poles and wire installation as well as construction of the gasline are not going to affect these areas. Therefore, no net loss of habitat units or value of Habitat Category 2 will occur as a result of activity in this area.

LOCATION OF HABITATS -- PROJECT ORDER ADDENDUM 2 PARAGRAPH I.B

A map showing the location of sitings of sensitive species and critical habitat is provided as Figure P-1a.

NATURE, EXTENT AND DURATION OF IMPACTS - OAR 345-21-015(1)(p)

Direct Impacts

Ground-nesting birds and small mammals could potentially be affected by disturbance or nest destruction during construction of the energy facility and gas pipeline, or upgrading of the electrical transmission line. Because of the lack of evidence of Washington ground squirrel and burrowing owl during surveys of the proposed project facility sites, it is not expected that the project construction will impact these species.

The Project will not withdraw water from the Umatilla River, and therefore will not adversely affect flows in the river. Therefore, no adverse impacts on fish in the Umatilla River are anticipated from its construction or operation.

Indirect Loss of Habitat -- Project Order Addendum 2 Paragraph II.G.4

ODFW has expressed concern over loss of habitat due to indirect impacts. It has been estimated that approximately 80 percent of the land within the Columbia Basin High Lava Plain Physiographic Province has already been developed for agriculture or other uses (Henjum 1993). For this reason, ODFW is concerned about any loss of additional habitat and its impact on sensitive species.

Indirect effects on habitat from the project could result from activities associated with water supply and wastewater disposal (if land application of wastewater is utilized), and potential growth inducing affects from generation of electricity and sale of steam to Lamb-Weston.

Water for the project will be supplied from the Port of Umatilla regional water project. As discussed in Section O, the Port plans to develop a regional system that will deliver water drawn

from the Columbia River under existing appropriations to the City of Hermiston, users south of Hermiston and users in the Port's industrial development area near the intersection of Interstates Routes 82 and 84, directly adjacent to the energy facility site.

The only additional facilities necessary to serve the Hermiston Generating Project will be a short distance of pipe interconnecting the Project with the main water line serving the adjacent properties which will not affect wildlife or habitat because it will be located in previously disturbed areas. Water will be drawn from the Columbia River for use at the project site; however, this water is already appropriated for the Port, and the Project will not result in any additional appropriation. Further, the Project's requirements of 3.8 million gallons per day (MGD) is less than 0.007 percent of the average minimum daily flow (56,404 MGD) of the Columbia River at John Day Pool (based on Corps of Engineers flow data from 1985 to 1991). Therefore, no impact on Columbia River fisheries habitat is expected from the project.

If the sidesteam softener system is not used for treatment of process water, wastewater from the project will be supplied to Madison Ranches for crop irrigation. This water would be used in combination with fresh water from existing water rights held by Madison Ranches. The wastewater would offset the need for additional fresh water use and would help provide center pivot irrigation in an area that has been previously disturbed by dry crop farming. Although wastewater supplied to Madison Ranches would not result in conversion of native habitat to agricultural use, non-native habitat can function as grassland habitat for a number of species. Impact on burrowing mammals could occur due to loss of this grassland to irrigation. Conversely, as noted during the wildlife surveys for the project, birds such as the long-billed curlew use irrigated fields as well as native habitat for foraging during the summer months.

The Project will produce electrical energy for delivery to the regional utility grid to respond to needs driven by a variety of factors, including load growth, loss of existing regional resources, and the need for additional non-hydroelectric generation to accommodate salmon recovery. The Project is not expected to induce additional growth in power requirements. Nevertheless, the delivery of this electrical energy to the regional grid from the Project may result in indirect impacts; however, these indirect impacts are not unique to the Project and would be associated with any power resource that is developed in response to the regional power needs.

Sale of steam to Lamb-Weston is intended to offset fuel consumption from use of their existing boilers, rather than expansion of the capacity of the potato processing facility. The Project's steam supply may enhance the competitive viability of Lamb-Weston, which may result in indirect impacts.

As explained in Exhibit U, the workforce during construction and the operating staff for the Project is expected to be drawn primarily from the local community. Thus the indirect impacts of population growth due to the Project are not expected to be significant.

Recognizing the potential for these indirect impacts, Applicant proposes the approach to indirect impact mitigation described in the mitigation section below.

MITIGATION MEASURES - OAR 345-21-015(1)(p); PROJECT ORDER, PARAGRAPH 19(i)

Mitigation for Direct Impacts

Potential direct adverse impacts can be avoided by scheduling construction outside the nesting season for ground nesting species. The bird nesting season is approximately April 15 through August 1. If this cannot be done, the energy facility site, and the transmission line and gas pipeline rights-of-way, will be surveyed again by qualified biologists and nest sites will be identified prior to construction. Discussions would then be held with the local ODFW wildlife biologist to identify whether mitigation is necessary. Prior to issuance of the Site Certificate for the Hermiston Generating Project, a mitigation plan will be developed with input from ODFW to be implemented in the event that mitigation is necessary. Mitigation and enhancement possibilities which could offset potential minor adverse impacts include placing a few nesting platforms for raptors on the new transmission line.

A plan for mitigating loss of Catagory 4 habitat at the energy facility site will also be developed with input from ODFW. This mitigation may be combined with that for indirect impacts as discussed below.

If wintering bald eagles do occur occasionally at the Umatilla River at the site of the electric transmission line crossing, it is very unlikely that they would be adversely affected by upgrading of this line, as long as the upgraded line is a raptor-proof design. Raptor protection will be employed in the design of the transmission towers following the methods described by Olendorff et al. (1981). A detailed design will be submitted to ODFW for review during the design phase of the Project. All energized facilities will be designed with adequate separation of a minimum of nine feet; the greatest wingspan expected in the area is the 8.5-foot wingspan of the bald eagle. See also Exhibit R.

Mitigation for Indirect Impacts -- Project Order Addendum 2 Paragraph II.G.4

As indicated in the Project Order, no requirements have been identified for the mitigation of indirect effects on habitat. However, Applicant is willing to mitigate for reasonably identifiable indirect impacts of the Hermiston Generating Project. Applicant has and will continue to discuss possible approaches to mitigation with ODFW. Mitigation may include establishment of natural habitat preserves or contribution to existing ODFW programs for development or enhancement of habitat. A plan for mitigating indirect impacts will be developed with input from ODFW prior to issuance of the Site Certificate for the Hermiston Generating Project.

Mitigation in Lieu of Surveys -- Project Order Addendum 2 Paragraph II.G.2

As indicated above, additional sets of field surveys have been agreed upon in conversations with ODFW and these surveys were completed in April and May 1993. Surveys to determine the presence of the Washington ground squirrel and the burrowing owl, as called for in Project Order Addenum 2 Paragraph II.G.1, have been completed, with no detection of the presence of either of these species. Based on discussions with ODFW, no additional surveys are contemplated following the finding of completeness of the Site Certificate Application. Therefore, no mitigation plans are proposed as alternatives for these field surveys.

REFERENCES

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Germond, Jon, Fisheries Biologist, ODFW, Pendleton, OR. Personal Communication. Meeting with Lynn Sharp and Roy Skinner on October 26, 1992.

Henjum, Mark, Biologist, ODFW, La Grande, OR. Personal Communication. Telephone conversation with Roy Skinner on May 21, 1993.

Ingles, Lloyd G. 1965. Mammals of the Pacific states. Stanford University Press, Stanford, California. 506 pp.

National Geographic Society. 1987. Field guide to the birds of North America. National Geographic Society, Washington, D.C. 464 pp.

Nussbaum, R.A., Brodie, Jr., E.D. and Storm, R.M. 1983. Amphibians and reptiles of the Pacific northwest. The University Press of Idaho, Moscow, Idaho. 332 pp.

Oregon Natural Heritage Program (ONHP). 1991. Rare, threatened and endangered plants and animals of Oregon. Oregon Natural Heritage Program, Portland, Oregon. 64 pp.

Stebbins, Robert C. 1966. A field guide to western reptiles and amphibians. Houghton Mifflin Company, Boston, Massachusetts. 279 pp.

Stern, Mark, Wildlife Biologist, The Nature Conservancy, Portland, Oregon. Personal Communication. Telephone conversation with Lynn Sharp on July 14, 1992.

U.S. Fish and Wildlife Service. 1991. Federal Register Vol. 56 No. 228, November 21, 1991. Notice of Review - Animals.

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Woodward-Clyde. 1992. Vegetation and Wildlife Investigation, Hermiston Generating Project. Prepared for U.S. Generating Company.

TABLE P-1
WILDLIFE SPECIES IDENTIFIED DURING FIELD SURVEYS OF THE HERMISTON GENERATING STUDY AREA DURING

COMMON NAME	SCIENTIFIC NAME
REPTILES	
short-horned lizard	*Phrynosoma douglasii*
BIRDS	
American avocet	*Recurvirostra americana*
American crow	*Corvus brachyrhynchos*
American goldfinch	*Carduelis tristis*
American kestrel	*Falco sparverius*
American robin	*Turdus migratorius*
bank swallow (State sensitive)	*Riparia riparia*
barn swallow	*Hirundo rustica*
Bewick's wren	*Thryomanes bewickii*
black-billed magpie	*Pica pica*
black-crowned night heron	*Nycticorax nycticorax*
black-headed grosbeak	*Pheucticus melanocephalus*
black-necked stilt	*Himantopus mexicanus*
Brewer's blackbird	*Euphagus cyanocephalus*
brown-headed cowbird	*Molothrus ater*
California quail	*Callipepla californica*
Caspian tern	*Sterna caspia*
cliff swallow	*Hirundo pyrrhonota*
common nighthawk	*Chordeiles minor*
common raven	*Corvus corax*
European starling	*Sturnus vulgaris*
Forster's tern	*Sterna forsteri*

BIRDS (continued)

grasshopper sparrow (State sensitive)	*Ammodramus savannarum*
great blue heron	*Ardea herodias*
green-winged teal	*Anas crecca*
gull spp.	*Larus spp.*
horned lark	*Eremophila alpestris*
house finch	*Carpodacus mexicanus*
house sparrow	*Passer domesticus*
house wren	*Troglodytes aedon*
killdeer	*Charadrius vociferus*
lark sparrow	*Chondestes grammacus*
long-billed curlew (State sensitive)	*Numenius americanus*
lazuli bunting	*Passerina amoena*
mallard	*Anas plathrhynchos*
mourning dove	*Zenaida macroura*
northern harrier	*Circus cyaneus*
northern oriole	*Icterus galbula*
osprey	*Pandion haliacetus*
ring-billed gull	*Larus delawarensis*
ring-necked pheasant	*Phasianus colchicus*
red-tailed hawk	*Buteo jamaicensis*
red-winged blackbird	*Agelaius phoeniceus*
rock dove	*Columba livia*
rock wren	*Salpinctes obsoletus*
savannah sparrow	*Ammodramus savannaram*
short-eared owl	*Asio flammeus*
song sparrow	*Melospiza melodia*
spotted sandpiper	*Actitis macularia*
Swainson's hawk (State sensitive)	*Buteo Swainsonii*

tern sp. (probably Forster's)	*Sterna* sp.
tree swallow	*Tachycineta bicolor*
BIRDS (continued)	
western kingbird	*Tyrannus verticalis*
western meadowlark	*Sturnella magna*
white-crowned sparrow	*Zonotrichia leucophrys*

MAMMALS

badger	*Taxidea taxus*
black-tailed jackrabbit	*Lepus californicus*
coyote	*Canis latrans*
desert cottontail	*Sylvilagus audubonii*
ground squirrel sp. or spp.	*Spermophilus* sp. or spp.
kangaroo rat	*Dipodomys ordii*
plains pocket gopher	*Thomomys talpoides*
pocket mouse	*Perognathus sp.*
red fox	*Vulpes vulpes*
weasel sp. (sign, probably long-tailed)	*Mustela* sp.
yellow-bellied marmot	*Marmota flaviventris*

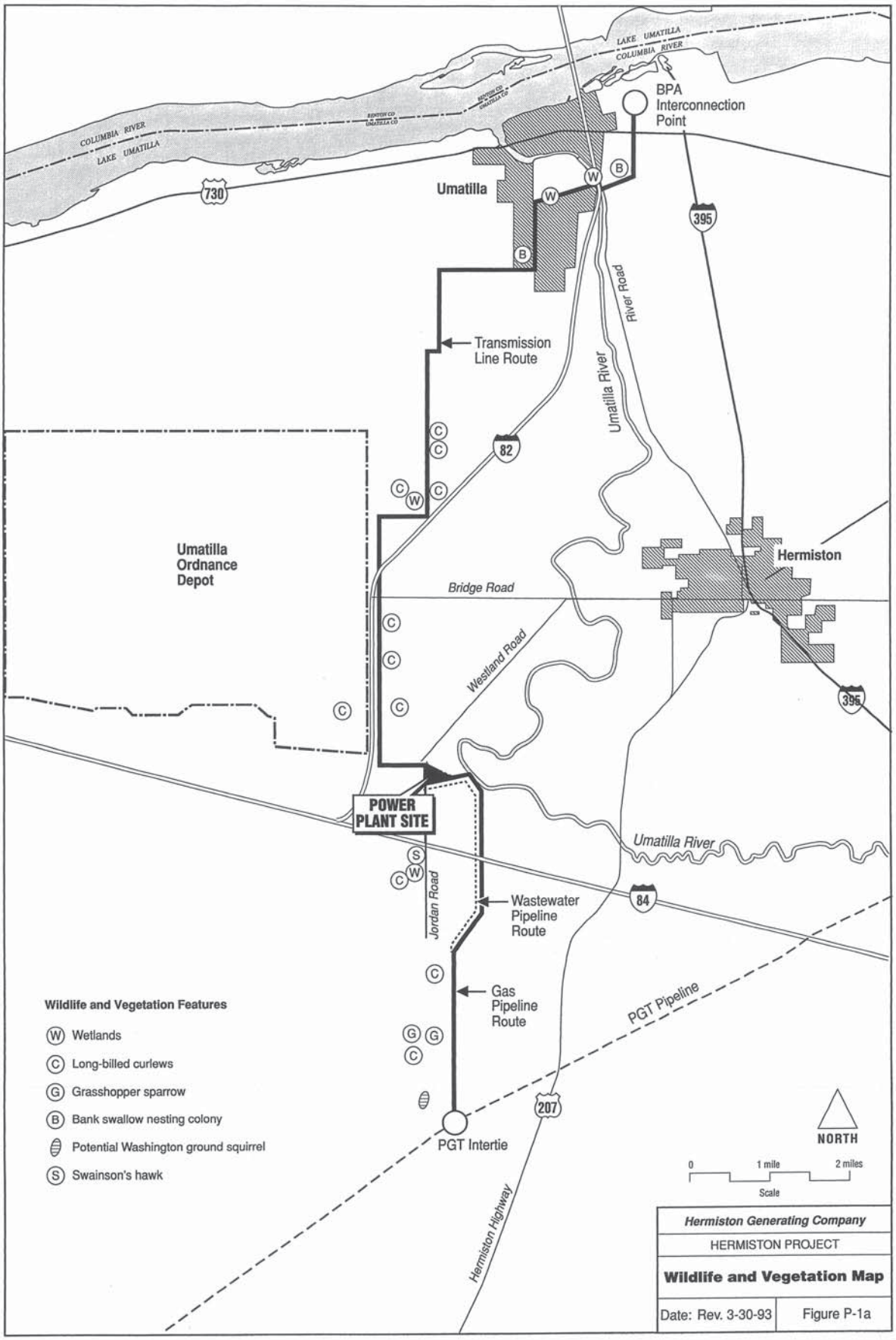
Source: Woodward-Clyde, 1992

TABLE P-2
PLANT SPECIES IDENTIFIED DURING FIELD SURVEYS OF THE HERMISTON GENERATING STUDY AREA

Scientific Name	Common Name
TREES	
Acer negundo	Box elder
Betula	Birch
Populus trichocarpa	Black cottonwood
Robinia pseudo-acacia	Black locust
SHRUBS	
Artemisia tridentata	Big sagebrush
Chrysothamnus nauseosus	Gray rabbitbrush
Chrysothamnus viscidiflorus	Green rabbitbrush
Clematis ligusticifolia	Western virginsbower
Elaeagnus angustifolia	Russian olive
Purshia tridentata	Antelope bitterbrush
Salix	Willow
GRAMINOIDS	
Agropyron cristatum	Crested wheatgrass
Bromus tectorum	Cheatgrass
Carex unilateralis	One-sided sedge
Elymus	Wildrye
Juncus effusus	Soft rush
Orizopsis hymenoides	Indian ricegrass
Panicum miliaceum	Broomcorn millet
Phalaris arundinacea	Reed canarygrass
Poa bulbosa	Bulbous bluegrass
Poa sandbergii	Sandberg's bluegrass
Polypogon monspeliensis	Rabbitfoot beardgrass
Scirpus validus	Softstem bulrush
Setaria viridis	Green bristlegrass
Sitanion hystrix	Bottle-brush squirreltail
Stipa comata	Needle-and-thread
FORBS	
Achilleamillefolium	Yarrow
Amsinckia intermedia	Coast fiddleneck
Amsinckia lycopsoides	Tarweed
Amsinckia menziesii	Small-flower fiddleneck
Arctium minus	Common burdock
FORBS (continued)	

Asclepias speciosa	Showy milkweed
Astragalus sclerocarpus	Stalk-pod milkvetch
Astragalus succumbens	Columbia milkvetch (ONHP List 4)
Balsamorhiza sagittata	Arrowleaf balsamroot
Calochortus macrocarpus	Sagebrush mariposa (ONHP List 3)
Chaenactis douglasii	Hoary chaenactis
Chenopodium album	Lambsquarters
Chrysopsis villosa	Hairy goldaster
Cirsium	Thistle
Cirsium arvense	Canada thistle
Cleome lutea	Yellow bee plant
Cuscuta pentagona	Field dodder
Cymopterus terebinthinus	Turpentine cypopterus
Epilobium watsoni	Watson's willowherb
Erodium cicutarium	Filaree
Lactuca serriola	Prickly lettuce
Layia glandulosa	Tidytips
Lepidium perfoliatum	Clasping pepperweed
Lomatium	Lomatium
Lupinus	Lupine
Lupinus sericeus	Silky lupine
Malva neglecta	Cheeseplant
Medicago sativa	Alfalfa
Melilotus alba	White sweetclover
Melilotus officinalis	Yellow sweetclover
Oenothera	Evening primrose
Opuntia polyacantha	Prickly pear
Phacelia hastata	Phacelia
Phlox longifolia	Long-leaf phlox
Plantago patagonica	Indianwheat
Polygonum	Knotweed
Polygonum convolvulus	Ivy bindweed
Polygonum persicaria	Lady's thumb
Psoralea lanceolata	Lance-leaf scurfpea
Rorippa nasturtium-aquaticum	Watercress
Rumex venosus	Wild begonia
Salsola kali	Russian thistle
Sisymbrium altissimum	Tumblemustard
Solanum dulcamara	Bittersweet
Solidago	Goldenrod
Tragopogon dubius	Yellow salsify
Typha latifolia	Cattail
Urtica dioica	Stinging nettle
Veronica anagallis-aquatica	Water speedwell

Source: Woodward-Clyde, 1992



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APPENDIX P-2

TECHNICAL MEMORANDUM
HERMISTON PROJECT
WILDLIFE FIELD SURVEY RESULTS TO DATE
May 7, 1993

Woodward-Clyde Consultants

Engineering & sciences applied to the earth & its environment

TECHNICAL MEMORANDUM

TO: U.S. Generating Company

FROM: Lynn Sharp

DATE: May 7, 1993

SUBJECT: Hermiston Project, Wildlife Field Survey Results to Date

INTRODUCTION

Field surveys were conducted in portions of the project study area of the proposed Hermiston Generating Project as a follow-up to 1992 surveys conducted by Woodward-Clyde Consultants (WCC 1992). These surveys were necessary for several reasons. The primary reason was that the gas pipeline route had not been identified at the time of the 1992 surveys. The gas line route was identified in the spring of 1993. Several species classified as sensitive by Oregon Department of Fish and Wildlife (Oregon Natural Heritage Database 1991) had been observed during the 1992 surveys or were suspected to occur in the general area of the proposed gas pipeline. In addition, searches were needed of the sites of two Washington ground squirrel colonies that had been reported by Betts (1990).

Mitigation requirements for fish and wildlife habitat impacts are specified under OAR 635-415-000 through 030. Before mitigation requirements could be specifically identified, it was necessary to confirm whether any species of concern are present and likely to be affected by the proposed project; particularly, the proposed gas pipeline once its route was identified.

METHODS

Field surveys were conducted on April 9, 16, and 26, 1993. The April 9 survey was conducted by four biologists, who walked the entire length of the proposed gas pipeline route. An area 500 feet on either side of the proposed gas pipeline was surveyed. Because the gas pipeline route traversed an area dominated by center pivot irrigation systems south of the High Line Canal, much of the area within 500 feet on either side of the proposed gas line was cultivated and not suitable habitat for nesting or denning by wildlife species of concern. The April 9 survey was conducted between 0800 hrs and 1300 hrs. The weather in the morning of April 9 was clear and calm, with increasing wind after about 1000 hrs, and a few thunderstorms locally after 1200. The route taken originated at the PGT pipeline construction site at 0800, and the portion of the proposed pipeline that contained potentially suitable habitat for species of concern was covered by 1000 hrs when weather conditions were ideal

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for the survey. It was evident during the April 9 survey that a single individual could cover the habitats of concern. Weather conditions during the April 16 and 26 surveys were clear, calm, and warm and optimal for detection of birds and ground squirrels. The subsequent surveys were conducted by one person. Additional surveys are scheduled for May 8 and 19, 1993 because the cool, wet, and windy weather this spring has limited good survey conditions and appears to have delayed the return of some migratory bird species.

Areas that had been identified as confirmed or probable Washington ground squirrel colonies by Betts (1990) were searched prior to 0800 hrs on April 9 by four biologists. Two sites, one on the southeast corner of Ward Butte, and one along the southern extension of Jordan Road that provides access to Madison Ranches, were searched.

RESULTS

The species observed during the 1993 surveys are listed below. Scientific names are given only for those species that were not recorded in the 1992 surveys reported by WCC (1992).

Mammals

badger (diggings)
black-tailed jackrabbit (*Lepus townsendii*), north of I-84, sign common throughout the area
coyote (tracks, scats)
kangaroo rat (burrows)
pocket gopher sp. (mounds)
Nuttall cottontail

Birds

barn swallow
black-billed magpie
common raven (*Corvus corax*), south end of gas pipeline route
grasshopper sparrow (in Section 20, T5N, R28E; same location as 1992 observations along the electric transmission line)
gull spp. (flying over)
horned lark
killdeer
long-billed curlew
mallard (flying over)
mourning dove
northern harrier
red-tailed hawk
ring-necked pheasant
rock dove

savannah sparrow (*Ammodramus savannarum*), probably migrants passing through, in grassland in south end of gas pipeline route
short-eared owl (*Asio flammeus*), nest with chicks was found on April 26, approximately 650 ft west of the pipeline route, just before it angles northeast near the pumphouse
Swainson's hawk (suspected territory/nest east of Umatilla River)
western kingbird
western meadowlark
white-crowned sparrow (*Zonotrichia leucophrys*), probably migrants passing through, in south end of pipeline route

SENSITIVE SPECIES

Grasshopper sparrows were observed along the road that extends north from Jordan Road and provides access to Madison Ranches land during the spring 1992 surveys. Grasshopper sparrows have not been observed to date in the vicinity of the gas pipeline during the 1993 surveys. Grasshopper sparrows were observed in Section 20, T5N, R28E along the existing electric transmission line in 1992 and 1993.

Long-billed curlews are also a sensitive species and are present in the study area. They appear to be nesting in areas distant from the disturbance of the center pivot irrigation systems, the PGT gas pipeline at construction at the southern end of the study area, and the existing roads and farming activities. Curlews were observed foraging in center pivot irrigation circles on April 9, but evidence of nesting activity nearby was not observed.

Swainson's hawk, a sensitive species, was observed in both 1992 and 1993 near the Lamb Weston plant site. The 1993 observations indicated that nesting activity occurs in the wooded area east of the Umatilla River.

Washington ground squirrel colonies were not found within the study area. No evidence of active burrows was found at either of the sites that had been reported by Betts (1990) in and near the study area. The Ward Butte site may have been occupied by Washington ground squirrels as recently as last year, because there were some inactive burrows present that appeared to fit the size range and configuration for the species. Numerous badger holes within the area of these inactive burrows indicated a possible cause for loss of a ground squirrel colony, if one was present. No evidence of a colony was found along the Madison Ranches access road; in fact, a center pivot irrigation circle occupies the site of that colony as reported by Betts (1990).

References are cited in WCC's 1992 "Vegetation and Wildlife Investigation, Hermiston Generating Project" prepared for U.S. Generating Company.

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EXISTING AND PLANNED RECREATIONAL OPPORTUNITIES IN THE IMPACT AREA - OAR-345-21-015(1)(q)(A)

Existing Recreational Facilities and Opportunities

Most of the recreational activities in the vicinity of the Project (including hiking, fishing, hunting, and boating) are concentrated along the Columbia River and nearby National and State Wildlife areas. None of these is located within the project Impact Area. Nevertheless, limited recreational opportunities do occur within the Impact Area, and they are discussed below.

State Recreational Facilities

There are no State parks or other State-owned recreational facilities within the Impact Area and there are no plans for their development within the Impact Area (Willis 1992).

Umatilla County Recreational Facilities

There are no County recreational facilities within the Impact Area (Mabbott 1992).

Informal Recreational Opportunities Impacts -- Project Order Addendum 2 Paragraph II.K.1

Informal recreational opportunities exist in the Impact Area along the Umatilla River, which runs east of the energy facility site and is crossed by the electrical transmission line near the City of Umatilla. The river provides opportunities for fishing, hiking, and wildlife viewing, but no hiking trails or other recreational facilities are developed along the river.

Evaluation With Respect to OAR 345-22-100 Factors --
Project Order Addendum 2 Paragraph II.K.1:

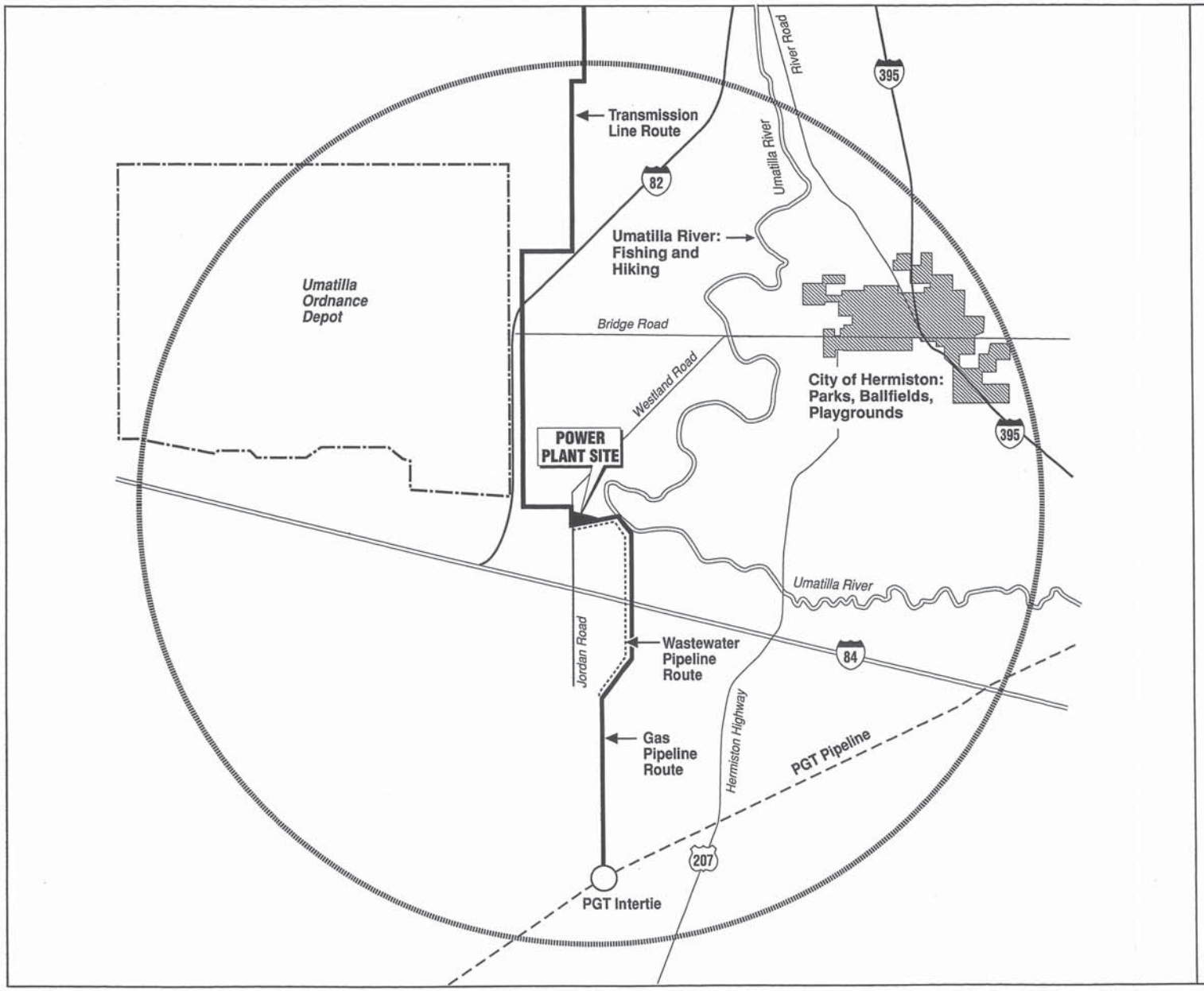
There is no formal management of recreational opportunities associated with the Umatilla River within the Impact area. The public has access to the River near the energy facility site from a County road that runs along the River. Fishing is allowed along the right-of-way. (Conforth 1992). Use of this area for recreational purposes is not in high demand. Most recreational activities in the area occur along the Columbia River. Recreational activities along the Columbia River are better developed than those along the Umatilla River. The Umatilla River does not

provide unique recreational opportunities or outstanding or unusual qualities. Recreational opportunities associated with the Umatilla River are not rare, irreplaceable or irretrievable.

City of Hermiston Recreational Facilities

The City of Hermiston is located within the Impact Area. Recreational facilities in the City of Hermiston include:

- The Umatilla Fairgrounds;
- A community recreational center;
- Three small neighborhood parks offering picnic and playground facilities;
- Three large parks offering ball fields, basketball courts, tennis courts, playgrounds and picnic facilities;
- A four-complex ball field; and



5-mile Impact Area Boundary

NORTH

0 1 mile 2 miles
Scale

Hermiston Generating Company
HERMISTON PROJECT
Recreational Facilities and Opportunities Map
Date: 3-30-93 Figure Q-1a

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R

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Table R-1: Sensitive wildlife species known from the impact area

Common Name	Scientific Name	Status[1]
Washington ground squirrel	*Spermophilus washingtonii*	SC, ONHP 2
Northern bald eagle	*Haliaeetus leucocephalus*	ST, FT, ONHP 1
Long-billed curlew	*Numenius americanus*	FC3, ONHP 4
American white pelican	*Pelecanus erythrorhynchos*	SV
Yellow-billed cuckoo	*Coccyzus americanus*	F3B, SC, ONHP 2
Painted turtle	*Chrysemys picta*	SC, ONHP 3
Swainson's hawk	*Buteo swainsonii*	SV
Grasshopper sparrow	*Ammodramus savannarum*	SU, ONHP 3
Bank swallow	*Riparia riparia*	SU, ONHP 3

Notes:
[1] Status: SE =designated as an endangered species by the Oregon Department of Fish and Wildlife. ST = designated as a threatened species by the Oregon Department of Fish and Wildlife. SC = State Critical, listing for threatened or endangered status is pending, or listing may be appropriate if conservation actions are not taken, or species which are peripheral but at risk throughout their range, or disjunct populations. SV = State Vulnerable, listing as threatened or endangered is not believed imminent; listing could or is being avoided through continued or expanded use of protective measures and monitoring. SU = State Sensitive Undetermined, species 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 will be required before a judgment can be made.
FE = designated as an endangered species by the federal government. FT = designated as a threatened species by the Oregon Department of Fish and Wildlife. F3B = No longer listed as a Candidate species by the FWS; the name on the basis of current taxonomic understanding does not prepresent taxa meeting the Endangered Species Act's definition of "species." F3C = proven to be more abundant or widespread than previously believed and/or not subject to any identifiable threats.
Oregon Natural Heritage Program (ONHP): ONHP 1 = List 1, threatened with extinction throughout its range, needing active protection measures. ONHP 2 = List 2, threatened with extirpation or presumed extirpated from the state, often peripheral or disjunct. ONHP 3 = List 3, additional information is needed for a determination of status in Oregon. ONHP 4 = List 4, of concern but not currently threatened or endangered; includes taxa rare but currently secure, as well as taxa declining in abundance or habitat but still too common to be proposed as threatened or endangered.

Source: ONHP 1991, 1992.

Table R-2: Sensitive plant species known from the 50 mile radius around the project site

Scientific and Common Name	Status[1] FWS	ODA	ONHP	Range	Habitat	Flowering Period
Astragalus collinus var. laurentii Lawrence's milkvetch	C2			Known only from Morrow Co., OR	Basaltic Grassland Sagebrush Desert	May-Jun
Arenaria franklinii var. thompsonii Thompson's sandwort	C1[2]			Gilliam, Morrow and possibly Wasco counties, OR	Sand dunes, scabland, sagebrush slopes along the Columbia R.	May-Jun
Rorippa columbiae Columbia cress	C2			Widespread, sporadic occurrence throughout WA to CA, east to MT, NB, NM	Wet sites (lake, stream or ditch edges) in clayey soil	May-Aug
Allium robinsonii Robinson's onion	C3c			Vantage, WA to the mouth of the John Day R., OR	Sand and gravel deposits along the Columbia River	Apr-May
Allium pleianthum Many-flowered onion			3	Restricted to John Day Valley, Wheeler and Morrow counties, OR	Lower elevations, hllsides and flats with clayey soils and scanty vegetation	Apr-May
Cryptantha lecophaea Gray cryptantha	---		2-ex	Near the Columbia and lower Yakima rivers, from Wenatchee, WA to The Dalles, OR	Dry, sandy places or basalt talus	May-June
Lomatium watsonii Watson's desert parsley	---		2	South-central WA to north-central OR	Open hills, often in sagebrush	May
Myosurus minimus ssp apus var sessilflorus Sessile mousetail	C2		1	Umatilla and Gilliam counties	Alkali flats	Apr-May
Silene spaldingii Spalding's campion	C2	CS	1	WA, ID, MT and OR (Wallowa and Umatilla counties)	Undisturbed prairie on hillsides with deep loess soils	Jun-Jul
Mimulus jungermannioides Hepatic monkeyflower	---	CS	1	E. end of Columbia R. gorge south along the Deschutes and Umatilla rivers	Moss mats and/or seeps on cliffs in river canyons	May-Jun
Balsamorhiza rosea Rosy balsamroot	---		2-ex	Three localities in WA, 1 in Umatilla County	Rocky ridges at lower to mid-elevations	Apr-May

Notes:

1 Status abbreviations are:
U.S. Fish and Wildlife Service (FWS) ranks are: C1 = candidate list 1; C2 = candidate list 2; C3c = non-candidate plants
Oregon Department of Agriculture (ODA) ranks are: CS = candidate species list (May 1991)
Oregon Natural Heritage Program (ONHP) ranks are: 1 = taxa threatened with extinction throughout their entire range; 2-ex = presumed to be extirpated from the state of Oregon; 3 = species for which more information is needed before status can be determined.

2 Was federally proposed Candidate, but there may be taxonomic problems.

Sources:

ONHP, 1991 and 1992.

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S

The visual resources discussed above that are within the Project Impact Area are identified in Figure S-1

Impacts on Key Observation Points and Scenic Resources

With the possible exception of the Umatilla County Scenic-Historic Road and the McNary Lock and Dam, the Project will not be visible from any of the key observation points identified above.

Visibility from the Umatilla County Scenic-Historic Road -- Project Order Addendum 2 Paragraph II.I.1

The Project site is not significantly visible from the Umatilla County Scenic-Historic Road because of intervening buildings, vegetation, and topography. It is possible that the upper portions of the stacks may be visible from some portions of the road at distances greater than about 5 miles southeast of the site, where elevations are greater than the Project site and views are less obstructed by buildings and vegetation. If visible, the stacks will be seen in combination with other industrial and agricultural structures and will represent a small visual intrusion into views from the Road. At distances less than 5 miles, the Project site and facilities will not be visible from the Umatilla County Scenic-Historic Road. Therefore, the Project will not result in significant adverse visual impacts to the Road.

Visibility from the McNary Lock and Dam

The McNary Lock and Dam is located approximately ten miles north-northeast of the energy facility site and it would not be visible from the lock and dam. However, the northern end of the transmission line may be visible. Because of numerous other transmission lines in the immediate vicinity, the energy facility's transmission line will not be readily discernible. Therefore, the Project will not have an adverse scenic or aesthetic impact on the McNary Lock and Dam.

EVALUATION OF THE COMPATIBILITY OF THE PROJECT WITH THE VIEWED AREA OF THE LANDSCAPE - OAR-345-21-015(1)(s)(ii)

Visual Characteristics of the Existing Landscape

Figure S-1 shows the area contained within the thirty mile Impact Area, which encompasses the Umatilla Plain and the City of Pendleton. The northern portion of the Impact Area includes the

Umatilla Plain lowland, which is characterized by relatively flat to moderately rolling terrain, with elevations ranging from about two hundred and fifty feet to seven hundred and fifty feet above mean sea level (MSL). The Columbia River area defines the northerly boundary of the Plain as well as of the Impact Area. It is characterized by broad expansive views up and down the river, both at the water level and from the Plain. Moving eastward and southward within the Impact Area, elevations gradually increase to about 1300 feet near Pendleton and about 3400 feet at the southerly boundary of the Impact Area.

1 – Lake Umatilla
2 – McNary Lock & Dam
3 – Umatilla Co. Scenic-Historic Road
4 – Lake Wallula
5 – Hat Rock State Park
6 – Cold Springs Reservoir
7 – Wallula Gap
8 – McKay Reservoir

0 1 2 3 4 5 miles
Scale

NORTH

Hermiston Generating Company
HERMISTON PROJECT
Scenic and Aesthetic Areas Map
Date: Rev. 3-30-93 / Figure S-1a

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T

Trail. Much of the Oregon Trail has been destroyed by agricultural activities and other development. Therefore, SHPO is interested in preserving any remaining undisturbed portions (Gilsen 1992).

Umatilla County Comprehensive Plan -- Project Order Addendum 2 Paragraph II.J.1

The Umatilla County Comprehensive Plan does not identify any cultural resource sites in the area of the proposed project facilities; however, the plan states that "In some ways, all of Umatilla County should be considered a cultural area" and that areas throughout the County have cultural resource significance to the Indians. Additionally, the County recognizes that a comprehensive list of cultural resource sites is not practical, and therefore the County will protect cultural resource sites if and when found.

Site Surveys

A survey of the impact area was conducted by Heritage Research Associates, Inc. of Eugene, Oregon on December 1, 14, and 15, 1992 to determine the presence of historical, cultural, or archaeological resources. The pipeline and transmission line routes were surveyed in their entirety by teams consisting of two archaeologists. Each surveyor examined one side of the route at a time and each route was completed either by having both surveyors walk in tandem, covering each side of the route centerline, or by an individual walking the entire length of the assigned route on one side of the centerline and then returning on the other side of the centerline. The energy facility site was surveyed by four archaeologists walking straight, parallel transects at 30 meter intervals oriented north-south.

RESULTS OF DISCOVERY MEASURES - OAR-345-21-015(1)(t)(B)

Energy Facility Site

The site was covered with grass and low Russian thistle plants. Ground visibility averaged between 20 to 30 percent. Two shallow irrigation ditches were found running north-south and parallel to one another through the central part of the site. There were several low concrete fixtures along the length of each ditch, which probably served as gates. There were no artifacts associated with either of these features. Consequently, the age of the ditches is unclear. The ends of the ditches have been destroyed, either by the construction of the nearby roads or the dismantling of the irrigation system itself. These ditches were probably connected to some larger

system when they were in use, but no evidence of this larger system remains in the energy facility site. These features do not retain any degree of integrity and there is no indication that they are more than 50 years old. Therefore, these ditches were not recorded. No other historic or prehistoric cultural materials were found in this area.

Electric Transmission Line Right-of-Way

A dirt or gravel road access road parallels the transmission line on one side or the other for most of the route. Agricultural fields also border the transmission line for much of the route. Ground visibility was fair to good for most of the route, although this visibility was primarily due to disturbances created by the road or the plowed fields. No prehistoric or historic cultural materials were found during the survey of the electrical transmission line route.

Gas Pipeline Right-of-Way

The portion of the gas pipeline right-of-way north of Interstate-84 parallels railroad tracks and a gravel road. South of the highway the right-of-way parallels north-south fences until it crosses the High Line Canal. From this point, the remainder of the route crosses range and agricultural land, including plowed and center pivot irrigated fields. The majority of the route supports introduced grasses or is under cultivation. Ground visibility varied from greater than 90 percent in the plowed areas to between 20 and 30 percent elsewhere. No historic or prehistoric cultural resources were observed along the gas pipeline route.

Confederated Tribes of the Umatilla Indian Reservation (CTUIR) Involvement -- Project Order Addendum 2 Paragraph II.J.1

To further ensure that cultural resources are not adversely affected by the Project, Applicant will consult with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to identify specific concerns relating to cultural resources. Based on input from CTUIR representatives, Applicant proposes the following steps to further ensure that cultural resources are identified and protected to avoid inadvertent discovery during construction. Prior to commencement of construction, CTUIR will conduct a review of the oral history of the tribes to identify areas having have high potential for cultural resources that may be affected by the Project. Representatives of CTUIR will also review the results of the archaeological studies described above. If deemed necessary by CTUIR, additional pre-construction field surveys will be conducted with the cooperation of CTUIR. If resources are identified through these surveys,

appropriate action will be taken to avoid or otherwise protect these resources. Applicant will also arrange with the CTUIR to have a CTUIR representative, knowledgeable in cultural resources of the area, to be available for on-site monitoring during construction activities.

Potential Impacts

Because no known historical, cultural, or archaeological resources exist within the Impact Area and no resources were identified during the surveys of the Impact Area, the Project is not expected to affect these resources. However, the possibility always exists that during construction excavation, subsurface resources or resources covered by vegetation that could not be seen during field surveys may be discovered. Should that be the case, such resources could be adversely affected by the excavation.

Measures to Protect Cultural Resources -- Project Order Addendum 2 Paragraph II.J.1

To ensure that any potential cultural resources in the project area are identified and protected, Applicant will arrange with the CTUIR to have a CTUIR representative, knowledgeable in cultural resources of the area, to be available for on-site monitoring during construction activities. If historic, cultural, or archaeological resources are found during Project excavation, work in the affected area will be stopped until an appropriate representative of the CTUIR or other archaeologist has evaluated the significance of the find and determined all necessary actions to minimize or avoid further impacts. SHPO will also be consulted to assist in developing procedures to avoid impacting such resources or to preserve those resources that may be disturbed upon the resumption of excavation. Construction activities in the area of the discovery will not resume until appropriate action has been taken as determined by the CTUIR or the SHPO.

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EXHIBIT U

SOCIOECONOMIC IMPACTS - OAR 345-21-015(1)(u)

INTRODUCTION

The EFSC must find under OAR 345-22-110 that, taking into account mitigation, construction and operation of the Project will not result in any significant adverse impact on the ability of local governments in the Impact Area to provide essential government services.

The Impact Area for socioeconomic impacts as defined in the Project Order consists of the area within 30 miles of the energy facility site.

This Exhibit evaluates the potential impacts of the Project on the ability of communities in the Impact Area to provide essential governmental services, including sewer and sewage treatment, water, stormwater, solid waste, libraries, police and fire protection, health care, and schools, and evaluates the impacts of the project on the economic welfare of the area.

LOCAL GOVERNMENTS WITHIN THE IMPACT AREA

The Impact Area for socioeconomic impacts covers two counties: Umatilla and Morrow. Within the Impact Area for Umatilla County, Hermiston, Umatilla, Stanfield, Pendleton and Echo are incorporated cities. Within the Impact Area for Morrow County, Irrigon and Boardman are incorporated communities.

ESSENTIAL GOVERNMENT SERVICES

Sewer and Sewage Treatment

The City of Hermiston has a sewage treatment facility that was constructed approximately 12 years ago and is designed to handle a treatment capacity of 2.9 million gallons a day (MGD). Currently the facility is operating at an average of about 33% capacity, and during peak flows, the facility is treating about 1.3 to 1.4 MGD, which represents less than 50% of total capacity (Schiffner 1992).

The other cities and towns within the Impact Area have sewage treatment systems that provide service to their communities.

Water Supplies

The City of Hermiston's municipal water system consists of two deep wells and one surface well. The City is presently exploring the possibility of diverting water from the Columbia River to meet future water needs. The City is currently providing about 900 million gallons of water a year to residents of the community (Woodward 1992).

The other cities and towns within the impact area obtain water from groundwater wells.

Stormwater

No governmental entity within the Impact Area provides stormwater disposal as a governmental service except through the municipal sewer facilities described above.

Solid Waste

There are two primary landfills in Umatilla County to accommodate solid waste. The Hermiston Landfill has a projected capacity of 25,000 to 30,000 tons per year for 40 years, and the Pendleton Landfill has a projected capacity of 20,000 tons per year for 40 years. Several smaller landfills also operate in the County, including landfills located on the Umatilla Reservation and in

Milton-Freewater, Pilot Rock, and Athena. Landfills in Umatilla County are operating below capacity and there are no plans to site any new landfills in the immediate future (U.S. Army 1991).

The largest landfill in Morrow County is the Finely Butte Waste Disposal Company's new regional landfill in Boardman. The landfill is designed to handle one thousand tons of garbage per day for fifty years. The landfill has over five hundred acres of land available for current use and an additional one thousand acres on which to expand (U.S. Army 1991).

Libraries

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

Police and Fire Protection

This section discusses the level of police and fire protection for each of the communities within the Impact Area. The discussion is summarized in Table U-1.

State of Oregon

The Oregon State Police (OSP) has an office in the McNary District of the City of Umatilla. Twenty officers are currently stationed there. OSP would, along with the Sheriff's Department, provide police services for the Project area.

Umatilla County

The energy facility site is within the jurisdiction of the Umatilla County Sheriff's Department. Police protection services will be provided by the Department's West County station which has a total of three deputies patrolling a service area of about 150 square miles (Cameron 1992).

Hermiston

The Hermiston Police Department provides police protection services within the city limits. The Department maintains a staff of 16 police officers and 7 dispatchers. The Hermiston Police Department would provide second response capabilities for the energy facility site through its mutual aid agreement with the Sheriff's Department. The Department coordinates 911 emergency response through the Hermiston Safety Center (Asher 1992).

The energy facility site is located within the Hermiston Rural Fire Protection District, and fire protection services to the site are provided by the Hermiston Fire Department. The Department has a total of 13 full-time personnel and 40 volunteer firefighters. The Department is equipped to handle fire and medical emergencies, and hazardous materials spills (Stearns 1992).

Umatilla

Police protection services are provided by the Umatilla Police Department which has a staff of 6 police officers. Emergency 911 response is dispatched through the Hermiston Safety Center. The Department maintains mutual aid and intergovernmental agreements with nearby police departments, the Umatilla County Sheriff's Department and the State Police (Olson 1992).

The Umatilla Fire Department is a volunteer department with 30 volunteers. The Department maintains mutual aid agreements with other fire departments (Roxbury 1992).

Stanfield

Police protection is provided by the Stanfield Police Department which has a staff of 3 police officers. Emergency 911 response is provided by the Hermiston Safety Center (Wainwright 1992).

Fire protection services are provided by the Stanfield Fire Department. Total personnel include 16 full-time firefighters. The Stanfield Fire Department has a mutual aid agreement with the Hermiston Fire Department and other departments in the area (Whelan 1992).

Echo

Police protection services are provide by the Umatilla County Sheriff's Department through a mutual aid agreement (Berry 1992). Emergency 911 response is provided by the Hermiston Safety Center.

Echo is located in the Rural Fire Protection District and fire protection is provided by the Echo Volunteer Fire Department which has a total of 25 volunteer fire fighters (Berry).

Pendleton

The Pendleton Police Department provides police protection services to the residents of Pendleton. The Department maintains a staff of 22 officers and 6 emergency dispatchers. In addition to the City's 911 emergency response capabilities, Umatilla County maintains a 911 dispatch center in Pendleton. The City and County departments have an agreement to provide back-up assistance to each other as needed (Ward 1992).

Fire protection services are provided by the Pendleton Fire Department. The Department has 24 full-time and 20 volunteer personnel, including paramedic units. The Pendleton Fire Department has a mutual aid agreement with Hermiston Fire Department and other departments in the area (Reynolds 1992).

Irrigon

Police protection is provided by the Umatilla County Sheriff's Department through a mutual aid agreement (Winter 1992)

Fire protection is provided by the Irrigon Fire Department, which is a volunteer department. There are a total of 20 volunteers. The department maintains mutual aid agreements with Hermiston Fire Department and other departments in the area (Buchanan 1992).

Boardman

The Boardman Police Department provides police protection services to the community. The Department maintains a total of 2 police officers (Muir 1992).

Fire protection is provided by the Boardman Volunteer Fire Department.

Table U-1: Police and Fire Services

	Police		Fire	
Jurisdiction	**Staffing**	**Services in Project Area**	**Staffing**	**Services in Project Area**
Oregon State Police	20 Officers	Primary Response	N/A	N/A
Umatilla County (West County Station)	3 Deputies	Primary Response	N/A	N/A
Hermiston	16 Officers 7 Dispatchers	Mutual Aid	13 Full-time 40 Volunteers	Primary Response
Umatilla	6 Officers	Mutual Aid	30 Volunteers	Mutual Aid
Stanfield	3 Officers	None	16 Full-time	Mutual Aid
Echo	N/A	N/A	25 Volunteers	Mutual Aid
Pendleton	22 Officers 6 dispatchers	None	24 Full-time 20 Volunteers Paramedics	Mutual Aid
Irrigon	N/A	N/A	20 Volunteers	Mutual Aid
Boardman	2 Officers	None	N/A	Mutual Aid

Health Care

Hospitals located in the Impact Area include the Good Shepherd Community Hospital in Hermiston and St. Anthony Hospital in Pendleton. The Hermiston Community Health Clinic provides outpatient care, laboratory, pharmacy, outreach, and social services. The Project will be serviced by the Good Shepherd Community Hospital, which is a fully equipped hospital including a helicopter pad for air evacuation. Good Shepherd Community Hospital 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 backup power supplies).

Schools

This section discusses the enrollment and capacity of the schools within the Impact Area. Table U-2 summarizes the number of students currently enrolled in each school and the current level of capacity.

Hermiston

The Hermiston Public School System has a total of six schools including Hermiston High School, Hermiston Junior High School, Highland Hills Elementary School, Rocky Heights Elementary School, Sunset Elementary School and West Park Elementary School. Total enrollment at these six school is 3,775 students. At the present time these schools are close to or at capacity. Hermiston High School has a current enrollment of 1,065 student for an 80% capacity; Hermiston Junior High School has an enrollment of 634 students and is at 97% capacity; Highland Hills Elementary School has 549 students for a capacity of 105%; Rocky Heights Elementary School has 531 students for a 105% capacity; Sunset Elementary School's student population is 506 for a 96% capacity; and West Park Elementary School has 490 students for a 95% capacity (Torres 1992).

According to the Superintendent's Office, the School System is currently undertaking a growth study to assess future demands on Hermiston Schools. A proposal is under consideration to construct a new middle school that would provide instruction for grades 6-8. Additionally, Hermiston Junior High School, which now offers instruction for grades 7-8, would change to a 6-

8 grade middle school. This would free up additional capacity at the existing elementary schools (Torres 1992).

Umatilla

The Umatilla Public School System maintains three schools, including McNary Heights Elementary School; Clara Brownell Middle School; and Umatilla High School. McNary has a current enrollment of 500 students for a capacity of 125%; Clara Brownell Middle School has 250 students and is at capacity; and the High School has an enrollment of 250 students and is also at capacity (Fenton 1992).

Stanfield

There are three schools within the Stanfield Public School System: West Elementary School with a current enrollment of 150 students; Stanfield Middle School with 280 students; and Stanfield High School with an enrollment of 155 students. All three schools are currently at capacity (Pomeroy 1992).

Echo

The Echo Public School System consists of one school, Echo Public School, which provides education for grades K through 12. The school has a current enrollment of 205 students and is at about 45 percent capacity (Enright 1992).

Pendleton

The Pendleton Public School System has a total of eight schools including; Pendleton High School, Pendleton Junior High School, Hawthorne Elementary School, Lincoln Elementary School, McKay Elementary School, Washington Elementary School, West Hills Elementary School, and Sherwood Elementary School. Total enrollment at these schools is 3,492 students. At the present time, all of these schools are at capacity. Current enrollment in these schools is: 715 at Pendleton High School; 788 at Pendleton Junior High School; 386 at Hawthorne; 209 at Lincoln; 363 at McKay; 391 at Washington; 173 at West Hills; and 467 at Sherwood.

Irrigon

The City of Irrigon is within the Morrow County School District. Irrigon maintains two schools including A.C. Houghton Elementary School and Columbia Junior High School. The Elementary School has a current enrollment of about 400 students and is at capacity. Columbia Junior High School's current enrollment is 209 students and is over capacity. High school-age students residing in Irrigon attend school in Boardman (Reed 1992).

Boardman

The City of Boardman is within the Morrow County School District. There are two new schools in the city, including Boardman Elementary School and Riverside High School. Junior High School-age students attend Columbia Junior High School in Irrigon. Boardman Elementary School has a current enrollment of 376 students for a capacity of 107%, and Riverside has 368 children for a capacity of 105% (Reed 1992).

Table U-2: School Enrollment and Capacity

	Enrollment	Percent Capacity
Hermiston		
Hermiston H.S.	1065	80
Hermiston J.H.S.	634	97
Highland Hills E.S.	549	105
Rocky Heights E.S.	531	105
Sunset E.S.	506	96
West Park E.S.	490	95
Umatilla		
Umatilla H.S.	250	At Capacity
Clara Brownell M.S.	250	At Capacity
McNary Heights E.S.	500	125
Stanfield		
Stanfield H.S.	155	At Capacity
Stanfield M.S.	280	At Capacity
West E.S.	150	At Capacity
Echo		
Echo Public School	205	46
Pendleton		
Pendleton H.S.	715	At Capacity
Pendleton J.H.S.	788	At Capacity
Hawthorne E.S.	386	At Capacity
McKay E.S.	363	At Capacity
Lincoln E.S.	209	At Capacity
Washington E.S.	391	At Capacity
West Hills E.S.	173	At Capacity
Sherwood E.S.	467	At Capacity
Irrigon		
Columbia J.H.S.	209	Over Capacity
A.C. Houghton E.S.	400	At Capacity
Boardman		
Riverside H.S.	368	105
Boardman E.S.	376	107

Other Socioeconomic Factors

Population

According to 1991 State population data, the total Umatilla County population was 60,100. Of this, approximately 40,085 persons lived in incorporated cities and 20,015 persons resided in unincorporated areas. The four cities: Hermiston, Umatilla, Stanfield, and Pendleton had populations of 10,015, 3,080, 1,580, and 15,440 respectively. The population for Echo was 580 persons in 1986, which represents the most recent population data for this area (U.S. Army

1991). In 1991, Morrow County had a total population of 7,800 with 3,565 in unincorporated areas. The communities of Irrigon and Boardman had populations of 820 and 1,465 respectively (Center for Population Research 1992).

Housing

The permanent housing supply in the Impact Area is very limited. Within the Impact Area, housing demand exceeds the supply, resulting in low vacancy rates and long waiting lists for persons looking for housing. Current vacancy rates are less than 0.5% (Fife 1992). Rental housing, when it becomes available, is rented immediately. New housing construction within the area is limited because the average income levels, generally, cannot support the costs associated with the construction of new housing for owner occupants (Culley 1992).

In Hermiston, about twenty to thirty new multi-family housing units may be constructed within one to two years. If demand is high, an additional 60 to 80 units may be constructed (Fife 1992).

Transient housing accommodations are provided by motels and recreational vehicle (RV) parks. Total motel accommodations for the Impact Area is approximately 884 units. Of this total, 159 units are available in Hermiston, 181 units are available in Umatilla, 111 units are available in Boardman and 433 units are available in Pendleton (Oregon Lodging Association 1992).

RV accommodations within the Impact Area are limited to two communities: Echo and Pendleton, for a total of 39 spaces. Seven spaces are available in Echo and 32 spaces in Pendleton (Oregon Lodging Association 1992). A new RV park with between 50 and 100 spaces is proposed for the Hermiston area (Woodward 1992).

Lamb Weston Plant Traffic Projection -- Project Order Addendum 2 Paragraph II.L.2

Access to the project site would be from the existing private access road to the Lamb-Weston potato processing facility, located off Westland Road. The project would share this access road with Lamb-Weston. Currently, the Lamb-Weston facility generates approximately 500 employee daily vehicular trips and about 60 truck trips. According to the Umatilla County Public Works Department, there are approximately 3,000 vehicular trips on Westland Road on a daily basis

(Pointer 1992). There is no available information on level of service or roadway capacity for Westland Road.

POTENTIAL IMPACTS

Potential Impacts on Essential Government Services

Sewer and Sewage Treatment

During Project operation, domestic wastewater would be treated by the Lamb-Weston treatment system. Industrial waste water generated by operations would be used for crop irrigation. The Project would not deliver wastewater to the Hermiston treatment facility or any other municipal treatment facility, and would therefore not result in any adverse impacts to municipal sewer systems.

It is expected that plant employees will be hired from the local area. Therefore, the Project will not result in increased demands placed on the sewer system from an increase in local populations generated by the Project.

Water Supplies

Process and Cooling Water

The Project will obtain process and cooling water from the Port of Umatilla's regional water supply system (see Exhibit O). Therefore, water use for process and cooling will not impact the ability of the local municipal water system to serve its other users.

Domestic Water Supply -- Project Order Addendum 2 Paragraph II.L.4

Water for domestic use will be supplied by Lamb-Weston's existing water supply system. If a new or major modification of an existing water treatment and supply system is required for domestic water supply for a project, plans for the system must be submitted to and reviewed by the Oregon State Department of Human Resources, Health Division's regional office in Pendleton. Lamb-

Weston's system will not require any modifications to supply water to the Hermiston Generating Project other than a supply line from their facility to the Project. Therefore, review and approval by the Health Division will not be required.

Because the Hermiston Generating Project will be supplied by the existing Lamb-Weston system, domestic water use at the project will not impact the ability of the local municipal water system to serve its other users.

Stormwater

Stormwater from the Project will be contained on site and reused for crop irrigation, as described in Exhibit B. Stormwater discharge from the Project will not have a significant adverse impact on the ability of governmental entities within the Impact Area to provide stormwater disposal services.

Solid Waste

The Plant will generate approximately 40 tons per year of solid waste. A recycling and waste minimization program will be developed for the Project that establishes guidelines for conservation and recycling of materials (see Exhibit V). Project generated solid waste could be accommodated by the Hermiston Landfill and would not result in adverse impacts to landfill capacities over the short or long term.

Because Project employees would be drawn from the local labor pool and are expected to be residents of the Impact Area, the Project would not result in an increase in new households. Therefore, the Project would not result in an increase in solid waste generated from new residences.

Libraries

The Project will not result in the creation of a significant number of new households within the Impact Area and will therefore have no impact on existing library services.

Police and Fire Protection

Police

The energy facility will be fenced and it will operate 24-hours a day with personnel on site at all times. This will minimize opportunities for theft or vandalism. Police protection would be provided by the Oregon State Police and the Umatilla County Sheriff's Department. According to the Sheriff's Department, the Project is not expected to result in significant adverse effects to the department nor its capability to provide adequate service to the area (Cameron 1992). Second response calls for emergency services would be provided by the Hermiston Police Department through its mutual aid agreement with the Sheriff's Department. The Hermiston Police Department anticipates no problems with providing police services to the site (Asher 1992).

The Project is not expected to generate significant numbers of new households within the Impact Area because most Project employees are expected to be hired from local communities. Therefore, the Project will not cause an increase in demand for police services as a result of new residents moving to the area.

Fire

The Project will be constructed with full hydrants and a sprinkler and deluge system. Project employees would be trained in emergency first aid procedures. According to the Hermiston Fire Department, if the Project provides all fire protection equipment and facilities in accordance with the Oregon Fire Code, it will not be expected to result in significant adverse impacts to the Department's existing capabilities (Stearns 1992).

The Project is not expected to generate significant numbers of new households within the Impact Area because most Project employees are expected to be hired from local communities. Therefore, the Project will not cause an increase in demand for fire services as a result of new residents moving to the area.

Health Care

The Project is not expected to adversely affect medical services in the Impact Area. Good Shepherd Community Hospital has ample capability to handle any emergency situation at the Project (Franz 1992).

Schools

The Project will not result in the creation of significant new numbers of households because it is expected that most plant employees will be hired from local communities. There will be no significant in-migration of new families, and consequently, no significant increase in the student population. The Project will not adversely affect the local schools.

The construction work force is not expected to include families. Consequently, temporary increases in the local population caused by the in-migration of 150 construction workers will not result in increases in the student population and there will be no impact on schools within the Impact Area.

Impacts on Other Socioeconomic Factors

Employment

The Project will result in the creation of approximately twenty-five permanent jobs over a twenty-four hour period. Fifteen employees would work during the 8:00 a.m. to 5:00 p.m. period, and five employees would cover each of the evening and nighttime shifts. Applicant expects that most, if not all, of these jobs will be filled by existing residents within the region.

The number of new permanent jobs created as a result of the project is considered to be moderate and will not result in significant increased demands to local services. The new jobs created by the Project will provide a positive impact to the local economy, as would the contribution of the Project to the local tax base.

Construction is expected to last approximately two years. The average construction work force will be approximately one hundred and fifty workers, with a peak at about two hundred workers. Of the total construction work force, Applicant expects that about 25 - 100 workers will be filled from outside the region. The remaining 100 - 175 will be drawn from the regional labor pool.

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

Increased Economic Activity

As noted above, the Project will create up to 200 temporary construction jobs and approximately 25 permanent jobs. These employees will purchase goods and services locally. In addition, the Project itself will purchase considerable quantities of goods and services from local and regional businesses, from plant maintenance services to office equipment to business services. All of this will result in a net in-flow of dollars into the local economy that will have a beneficial effect beyond that of the immediate new employees.

Increased Tax Revenues

The Project will be a major taxpayer to local government. This injection of additional tax revenues - at a time of widespread cutbacks in government services - will contribute to the provision of quality education, police, fire, and other municipal needs that will benefit the entire community.

Improved Lamb-Weston Competitiveness

The Project will provide considerable savings to Lamb-Weston by helping the potato processor reduce its operating costs. This will help to keep the Lamb-Weston Hermiston facility viable in the very competitive food processing market. Since Lamb-Weston employs over 500 people at the Hermiston plant, its economic viability is critical to the well-being of the Hermiston community.

Population

Limited in-migration is expected to occur as a result of the Project. Applicant expects to fill most, if not all, of the full-time plant operations jobs with residents from the local communities. Because new employees will be existing local residents, the Project is not expected to result in direct population increases.

Up to 200 workers will be required for construction at any one time over the two year construction period. Of this, about 100 - 175 of the construction workers are expected to be drawn from the region; the remaining work force is expected to be brought into the area. Applicant does not anticipate that these construction workers will bring their families with them because most would remain on the job site for only a matter of months.

Housing

During operation, the Project is not expected to increase demand for permanent housing in the Impact Area because plant employees will be hired mostly from the local community and are assumed to have housing already.

Temporary housing accommodations for the construction work force should reduce the vacancy rates for the motels, rental housing, and RV parks in the region during the construction period. Vacancy rates for these accommodations tend to be low throughout much of the year. Applicant estimates that accommodations can be arranged for the transient construction workers in the existing motels, rental units, and RV parks in the region.

Traffic -- Project Order Addendum 2 Paragraph II.L

Fuel Oil Tanker Traffic -- Project Order Addendum 2 Paragraph II.L.1

As fuel oil will not be required for the project, there will be no impact resulting from fuel oil deliveries.

Normal Operations Traffic -- Project Order Addendum 2 Paragraph II.L.2

During project operations, the peak hour volumes of traffic from normal Project operations are estimated to be as follows:

AM Peak Hour		**PM Peak Hour**	
enter:	5 trucks	enter:	5 trucks
	15 cars		5 cars
leave:	5 trucks	leave:	5 trucks
	5 cars		15 cars

Construction Period Traffic Project Order Addendum 2 Paragraph II.L.3

During the two-year construction period for the facility, it is estimated that the project would generate approximately 165 auto and 30 truck trips on a daily basis. Of this, about 5 trucks would enter and leave the project site during the AM and PM peak traffic hours. The portion of this traffic projection representing heavy haul loads is unknown at this time; however, the need for heavy haul loads may be reduced through the use of the adjacent railroad siding.

Expected Impacts

The estimated Project traffic both during construction and operation is a fraction of the over 500 trips occurring currently in connection with the Lamb-Weston plant and the approximately 3,000 trips occurring daily at Westland road, discussed above. According to the Public Works Department, increased traffic generated by the Project during operation would not be considered to result in significant traffic impact on Westland Road.

Construction activities would generate a greater number of vehicles using Westland Road than project operations, however, traffic would be distributed throughout the day and is not expected to result in significant traffic impacts.

However, the County did indicate concern about overall increased truck traffic on Westland Road as a result of its close proximity to Interstate Routes 82 and 84, and road maintenance as a result of this traffic (Phillips 1993).

MITIGATION

To minimize the potential for the adverse impacts on the supply of temporary housing, Applicant will coordinate with local businesses and individuals providing housing to secure adequate facilities in advance of the arrival of the construction workers. This could include arrangements with local Realtors to secure rental housing, and reserving blocks of motel rooms and RV spaces. If necessary, Applicant will consider the feasibility of providing temporary RV park accommodations during the construction period. This would require compliance with OAR 918-650-065 which permits exemptions from the State Building Code occupancy requirements including toilet facilities, road surface treatment, and spacing. In addition to State approval, planning and zoning approval would be required by Umatilla County.

Road Degradation Monitoring Plans and Traffic Impact Mitigation -- Project Order Addendum 2 Paragraph II.L.3

Rail delivery will be used to the extent practicable to minimize heavy-haul truck trips during construction.

In light of the County's concerns over increased truck traffic on Westland Road due to the proximity to Interstate Highways 82 and 84, the County recommends that Applicant enter into an Irrevocable Consent Agreement (ICA) with the County which formally acknowledges that Applicant agrees to waive their right to oppose the formation of any Local Improvement District (LID) that could be proposed at some future point in time to finance road maintenance and improvements (Mabbott 1993). Applicant will enter into an ICA with the County regarding possible future development of an LID as suggested by the County, to mitigate potential traffic impacts.

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EXHIBIT V

WASTE MINIMIZATION - OAR 345-21-015(1)(v)

INTRODUCTION

To issue a site certificate for the Project, the EFSC must find under OAR 345-22-120 that Applicant will, to the extent reasonably practicable, reduce the amounts of solid and liquid waste generated at the Project and recycle and reuse the wastes that are generated.

This Exhibit inventories potential solid and liquid waste streams during construction and operation of the Project, and discusses how wastes will be minimized and the extent to which practicable recycling will take place.

A program of waste minimization and recycling will be developed for construction and operation of the Project. The program will address both hazardous and non-hazardous waste. Wastewater will be put to beneficial use through crop irrigation.

HAZARDOUS AND NON-HAZARDOUS WASTE

Non-hazardous and hazardous wastes (both solid and liquid) will be generated during Project construction and operation. These materials may include waste steel, other waste metals, normal miscellaneous construction debris (consisting of wood, concrete, paper, and other refuse), aluminum cans, glass, waste oils, lubricants, solvents, antifreeze, soiled rags, aerosol cans, tires, paints, welding rod stub, lead-acid batteries, and spent SCR catalyst. During construction,

Applicant will identify means of minimizing waste generation and will recycle waste to the greatest extent practicable. Applicant will also develop and implement a waste minimization and recycling program to remain in effect throughout the life of the Project.

WASTE MINIMIZATION

Waste minimization will focus on the reduction of non-reusable materials and hazardous materials during Project construction and operation. To do so, Applicant will consider viable methods of eliminating waste at the source and a salvage program for reuse of excess or discarded materials. New product purchases will be evaluated to determine if alternate recyclable or non-hazardous products can be substituted to reduce waste generation. Examples of waste minimization and reuse measures that may be considered include:

- Use of non-hazardous solvents to reduce generation of hazardous used solvent and waste rags;
- Use of materials that generate wastes which can be neutralized for beneficial use;
- Reuse of scrap or waste lumber;
- Restricted use of pressure treated lumber; and
- Inventory control of paints to avoid waste due to over-purchase and expired shelf-life.

Major contractors will be required to develop and submit a waste minimization program to Applicant approval prior to beginning work on the Project.

RECYCLING

Applicant will develop a recycling program that is compatible with local programs for such materials as aluminum, scrap metal, glass, paper products, wood, batteries, and used tires. Recycling stations will be established at the energy facility for the collection and storage of recallable materials. Applicant will also investigate the potential for such recycling measures as: (1) deposit and return programs with local suppliers for 55 gallon drums of lubricants, coolants, and degreasers; (2) off-site reuse of paints that have exceeded technical shelf life requirements; (3) recycling of antifreeze and solvents; (4) recycling of aerosol cans; and (5) a reuse program for soiled rags. Applicant will also encourage recovery of the SCR catalyst by the supplier.

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3. Water will be applied to graded surfaces during construction to reduce the potential for wind erosion and silt fences or similar structures will be provided as necessary to further reduce soil erosion.

In addition, prior to construction, a detailed geotechnical investigation will be performed at the Project site to evaluate the subsurface conditions and further evaluate the potential for liquefaction, as well as provide information for foundation design, site preparation and grading, and roadway design.

The results of the investigation will be submitted to the Oregon Department of Energy (ODOE) and the Energy Facility Siting Council (EFSC) for review.

The geotechnical investigation will include groundwater observation wells, soil borings, and various testing. The exact scope and methodology that will be employed for the investigation will partially depend on the subsurface characteristic encountered at the site. The expected scope of the investigation will include:

- Borings beneath the footprint of key structures to define subsurface conditions across the site. The borings will be of sufficient depth (depending on subsurface conditions encountered) to define subsurface conditions to the anticipated depth of influence for the major foundation elements. Disturbed and undisturbed soil samples will be collected for visual and laboratory analysis of soil characteristics.

- Depending on subsurface conditions laboratory tests may include:

  - Moisture Content (ASTM D 2216)
  - Unit Weight
  - Specific Gravity (ASTM D 854)
  - Sieve Analysis (ASTM D 422)
  - Atterberg Limits (ASTM D 4318)
  - Chemical Analysis (chloride, sulfate, pH)
  - Moisture Density Testing (ASTM D 1557)
  - Unconfined Compression Test (Soil ASTM D 2166 or Rock ASTM D 2938)
  - Unconsolidated Undrained Triaxial Test (ASTM D 2850)

- Consolidated Undrained Triaxial Test with Porepressure Measurements
- Consolidation Test (ASTM D 2435)

- Standard Penetration Tests (SPT) at specified intervals to correlate blow counts to various soil properties.

- Cone penetration, piezocone, dilatometer, and vane shear as appropriate to determine penetration resistance, hydraulic characteristics, deformation characteristics, and shear strength of soils. These data can be used in determining bearing pressure and settlement, and pile capacity if necessary.

- Field resistivity to obtain data for switchyard and other grounding purposes.

- Installation of groundwater observation wells to determine groundwater depths for potential influence on foundations and liquefaction potential.

Expected locations of groundwater observation wells, soil borings, and other tests are identified on Figure G-5. Locations are approximate and may vary depending on site conditions identified. Technical specifications for subsurface investigations and laboratory testing are included as an appendix to this Exhibit.

Seismicity

The following measures will be taken to offset potential seismic impacts associated with the Project relating to seismicity:

1. Facility structures will be designed and constructed to minimize potential damage from strong ground shaking. This will include compliance with UBC requirements.

2. Facility structures will be founded in dense materials beneath unconsolidated surface materials to offset potential impacts from differential settlement.

3. Placement of electrical transmission towers will avoid or other wise mitigate for, to the extent practical, the narrow strip of alluvium along the Umatilla River that may be subject to liquefaction.

In addition, prior to construction, a detailed geotechnical investigation will be performed at the energy facility site to evaluate subsurface conditions and to evaluate further the potential for liquefaction. The investigation will also provide information for foundation design, site preparation and grading, and roadway design. The investigation will include drilling bore holes to confirm the depth to ground water and sampling of the subsurface materials for testing.

LAND USE PLANS AND POLICIES

The Project will comply with the Umatilla Comprehensive Plan and applicable zoning (both Umatilla County and the City of Umatilla) requirements. The Project will be compatible with nearby land uses. The proposed Project design and construction practices described in this application will avoid significant land use impacts.

PROTECTED AREAS

The Project is not located within Protected Areas as described in OAR 345-22-040. In addition, because of the distance of the Project from those areas, it will have no adverse impacts on them.

NATIVE VEGETATION AND SOIL COVER

Vegetation

Project impacts on native vegetation will be minimal. Native vegetation that does occur in the Project area is sparse, except for that within the Umatilla Ordnance Depot.. Disturbance will be limited to pole replacement activities along the right-of-way associated with upgrading the existing transmission line. In most cases, native vegetation can be avoided by construction activities. The Project will not affect the native vegetation within the Umatilla Ordnance Depot.

Revegetation Emphasizing Native Species -- Project Order Addendum 2 Paragraph II.G.3

As indicated in Exhibit N, areas disturbed by construction of the power plant, gas pipeline and transmission line will be revegetated upon completion of construction. Revegetation will emphasize the use of native species where appropriate, as determined through consultation with the Oregon Department of Agriculture and the Oregon Department of Fish and Wildlife.

Soils

Because of the susceptibility of the soils in the Project area to wind erosion, precautions will be taken during construction to minimize erosion. This could include watering of the site and pipeline access road and use of dust palliatives. Impacts to soils along the pipeline route will be limited to a short construction period. If appropriate, topsoils and subsoils will be segregated during excavation for the pipeline to minimize impacts on soil fertility.

FISH AND WILDLIFE SPECIES AND HABITAT

Mitigation for Direct Impacts

Potential direct adverse impacts can be avoided by scheduling construction outside the nesting season for ground nesting species and western kingbirds. The bird nesting season is approximately April 15 through August 1. If this cannot be done, the energy facility site, and the transmission line and gas pipeline rights-of-way, will be surveyed again by qualified biologists and nest sites will be identified prior to construction. Discussions would then be held with the local ODFW wildlife biologist to identify whether mitigation is necessary. Prior to issuance of the Site Certificate for the Hermiston Generating Project, a mitigation plan will be developed with input from ODFW to be implemented in the event that mitigation is necessary. Mitigation and enhancement possibilities which could offset potential minor adverse impacts include placing a few nesting platforms for raptors on the new transmission line, and ensuring that the poles of the new line also provides suitable sites for western kingbirds to construct nests.

A plan for mitigating loss of Category 4 habitat at the energy facility site will also be developed with input from ODFW. This mitigation may be combined with that for indirect impacts as discussed below.

If wintering bald eagles do occur occasionally at the Umatilla River at the site of the electric transmission line crossing, it is very unlikely that they would be adversely affected by upgrading of this line, as long as the upgraded line is a raptor-proof design. Raptor protection will be employed in the design of the transmission towers following the methods described by Olendorff et al. (1981). A detailed design will be submitted to ODFW for review during the design phase of the Project. All energized facilities will be designed with adequate separation of a minimum of nine feet; the greatest wingspan expected in the area is the 8.5-foot wingspan of the bald eagle. See also Exhibit R.

Mitigation for Indirect Impacts -- Project Order Addendum 2 Paragraph II.G.4

As discussed in Exhibit P, irrigation of farmland with water from the Project may result in the loss of grassland habitat. As indicated in the Project Order, no requirements have been identified for the mitigation of indirect effects on habitat. However, in an effort to offset potential indirect impacts from the project arising from the irrigation of previously dry farmed land, mitigation will be provided. Applicant has and will continue to discuss possible approaches to mitigation with ODFW. Mitigation may include establishment of natural habitat preserves or contribution to existing ODFW programs for development or enhancement of habitat. A plan for mitigating indirect impacts will be developed with input from ODFW prior to issuance of the Site Certificate for the Hermiston Generating Project.

Mitigation in Lieu of Surveys -- Project Order Addendum 2 Paragraph II.G.2

As indicated in Exhibit P, additional sets of field surveys called for in Project Order Addendum 2 Paragraph II.G.1, have been completed, with no detection of the presence of additional species. Based on discussions with ODFW, no additional surveys are contemplated following the finding of completeness of the Site Certificate Application. Therefore, no mitigation plans are proposed as alternatives for these field surveys.

RECREATION

No mitigation is necessary for recreational resources.

THREATENED AND ENDANGERED SPECIES

Potential adverse impacts on nesting birds can be avoided by scheduling construction of the transmission line and gas pipeline to avoid the nesting season for these species. Black (1992, personal conversation) suggested that the nesting season includes the period of mid-April through August 1. If construction schedules can not be arranged to avoid the nesting season, the energy facility site and the transmission line and gas pipeline right-of-ways will be surveyed to identify nest sites. If nests are identified, mitigation will be provided, which mitigation may include contributing funds to DFW habitat conservation programs. The gas pipeline route will be surveyed for the Washington ground squirrel during the late April to early May active season for the species. If any are located, the colonies will be avoided by construction if possible. If avoidance is not possible, Applicant will consult with DFW on appropriate mitigation measures to be taken.

Potential electrocution hazard to bald eagles and other raptors can be avoided by using a raptor-proof design for the new transmission line. Raptor protection will be employed in the design of the transmission towers, following the methods described by Olendorff et al (1981). Detailed design will be submitted to DFW for review during the design phase of the Project. All energized facilities will be designed with adequate separation of a minimum of nine feet. The greatest wingspan expected in the area is the 8.5 foot wingspan of the bald eagle.

VISUAL QUALITY AND AESTHETICS

Mitigation for Identified Areas of Scenic Value

The only portion of the Project that will be visible from the areas identified by the County as having scenic value is the upper portion of the stacks, the cooling tower plume, and the northern end of the electrical transmission line. Because of the relatively flat terrain and the height of these features, topographic screening is not practical.

To minimize visual intrusion caused by the stacks, they will be painted in a matte finished neutral color to minimize the potential for glare caused by reflective surfaces. Light colors such as light gray, gray-blue, or beige are colors most likely to blend with the surrounding area.

Mitigation for Other Visual Resources

1. To minimize visual intrusion caused by the stacks, the stacks will be painted in a matte finished neutral color to minimize the potential for glare caused by reflective surfaces. Light colors such as light gray, gray-blue, or beige are colors most likely to blend with the surrounding area.

2. To minimize Project visibility at night, outdoor lighting will be limited to the extent necessary to maintain safety conditions, and will consist of downward directional lights. Stair lighting will be manually engaged, so that when not in use, the stairs can remain unlighted.

3. Landscaping will be effectively utilized for screening and buffer purposes. To screen views of the energy facility and the nearest residence, shrubbery and trees will be planted along the perimeter of the site. Landscaping will be well-maintained and will include low-maintenance and indigenous plants.

HISTORICAL, CULTURAL AND ARCHAEOLOGICAL RESOURCES

To ensure that any potential cultural resources in the project area are identified and protected, Applicant will arrange with the CTUIR to have a CTUIR representative, knowledgeable in cultural resources of the area, to be available for on-site monitoring during construction activities. If historic, cultural, or archaeological resources are found during Project excavation, work in the affected area will be stopped until an appropriate representative of the CTUIR or other archaeologist has evaluated the significance of the find and determined all necessary actions to minimize or avoid further impacts. SHPO will also be consulted to assist in developing procedures to avoid impacting such resources or to preserve those resources that may be disturbed upon the resumption of excavation. Construction activities in the area of the discovery will not resume until appropriate action has been taken as determined by the CTUIR or the SHPO.

SOCIOECONOMICS

To minimize the potential for the adverse impacts on the supply of temporary housing, Applicant will coordinate with local businesses and individuals providing housing to secure adequate facilities in advance of the arrival of the construction workers. This could include arrangements with local Realtors to secure rental housing, and reserving blocks of motel rooms and RV spaces. If necessary, Applicant will consider the feasibility of providing temporary RV park accommodations during the construction period. This would require compliance with OAR 918-650-065 which permits exemptions from the State Building Code occupancy requirements including toilet facilities, road surface treatment, and spacing. In addition to State approval, planning and zoning approval would be required by Umatilla County.

Road Degradation Monitoring Plans and Traffic Impact Mitigation -- Project Order Addendum 2 Paragraph II.L.3

Rail delivery will be used to the extent practicable to minimize heavy-haul truck trips during construction.

In light of the County's concerns over increased truck traffic on Westland Road due to the proximity to Interstate Highways 82 and 84, the County recommends that Applicant enter into an Irrevocable Consent Agreement (ICA) with the County which formally acknowledges that Applicant agrees to waive their right to oppose the formation of any Local Improvement District (LID) that could be proposed at some future point in time to finance road maintenance and improvements (Mabbott 1993). Applicant will enter into an ICA with the County regarding possible future development of an LID as suggested by the County, to mitigate potential traffic impacts.

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EXHIBIT X

CONSTRUCTION SCHEDULE - OAR 345-21-015(1)(x)

Figure X-1 shows a construction schedule for Unit One of the two combined-cycle generating units of the facility. The construction of Unit 2 will follow a similar, either parallel or sequential, schedule. While preliminary, this schedule is representative of the construction process that will be followed for the energy facility.

The electric transmission line will be constructed concurrently with the energy facility to ensure its completion on or before the date of the first unit's commencement of operation. Construction of the electric transmission line will be performed primarily during the winter, when irrigation loads on this portion of the Umatilla Electric Cooperative Association distribution system are the lightest. It is expected that the transmission line can be completed within a single winter. The in-substation work at McNary Substation will be scheduled to minimize the impact on BPA's system.

The gas pipeline line will also be constructed concurrently with the energy facility so that fuel will be available on or before the date of the first unit's commencement of operation. Construction of the gas pipeline will require approximately three months of field work. This will performed primarily in the fall and winter months in order to minimize impacts on agricultural activities and to avoid nesting and mating seasons of local wildlife.

As shown in Figure X-1 and X-1A, the development, construction and procurement schedule (including permitting) is projected to require twenty five months from initial start to commercial operation. Preliminary work, which can be accomplished prior to obtaining financial closing for

the Project but does not involve any on-site activities will occur ahead of the twenty five month construction schedule.

All construction work will be performed either at the site of the energy facility or within the transmission and gas pipeline rights of way, that are described in Exhibit C and shown on Figures C-2 through C-4. It is possible that some construction materials and equipment may be temporarily stored on property adjacent to the site of the energy facility site.

Two-Unit Sequencing Detail -- Project Order Addendum 2 Paragraph III.A

It is Applicant's intent to construct both units at the earliest possible date. At this time, both units are being developed for operation by early 1996. The optimal construction schedule for the two units would include an approximate four-month lag between the time construction begins on the first unit and the time construction begins on the second unit. This would allow for sequencing of the various phases of work so that crews completing work on one phase of construction of the first unit could then immediately begin work on that phase of the second unit. However, actual construction schedules for the units will be dictated by the conditions of the power sales agreement(s).

Factors Affecting Construction Delay -- Project Order Addendum 2 Paragraph III.A

BPA is currently considering the purchase of power from the Project under their Resource Contingency Program. If power from one or both units is purchased by BPA under this program, construction may be delayed somewhat to accommodate BPA's scheduled power needs. The maximum delay that could occur under this scenario is unknown at this time; the timing and conditions for development of the resource as an option for BPA will be set out in an agreement between BPA and Hermiston Generating Company that has not yet been executed.

EFSC specifically recognized and encouraged the participation of non-utility generating companies competing in the wholesale marketplace without captive customers by providing that a Site Certificate could be issued for a project without an executed power purchase agreement specifying the terms for commencement of operations. On the other hand, Applicant would like to acknowledge the legitimate concerns on the part of EFSC and ODOE over issuing site certificates for facilities for an indefinite period of time. We agree that the potential for changes in permit conditions and technology advances, as well as changes in the prospects for a particular project, all dictate that there should be time limits as Site Certificate conditions. We believe such

conditions can be structured to accommodate the desires the Applicant and the needs of the marketplace as well as to protect the interests of EFSC as issuer of the Site Certificate.

Impact of Federal EIS on Project Construction Schedule -- Project Order Addendum 2 Paragraph I.C

The purchase of power from the Project by BPA will likely require evaluation of the Project under the National Environmental Policy Act (NEPA), including, potentially, preparation of an Environmental Assessment (EA) or Environmental Impact Statement (EIS) under the requirements of NEPA. This could potentially delay construction up to one year; however, it is possible that the time required for the NEPA review can be reduced, particularly if optimal use is made of the results of the reviews performed for the Oregon siting process.

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ESTIMATED LIFE OF THE PROJECT

The expected life of the Project is up to thirty years. Applicant anticipates that the initial power sales agreement for the Project will have a shorter duration, during which time all of the capital investment in the Project will be recovered and all debt obligations satisfied. Thereafter, Applicant will continue to operate the Project for as long as it can sell the electricity it generates and operate the Project.

REASONABLE METHODS FOR SITE RESTORATION

Because the Project will be designed to the most current standards for spill containment and material storage, and because of its use of natural gas fuel, site restoration will consist primarily of the dismantling and removal of unneeded equipment and structures on the energy facility site. As a result, no particular technical difficulties that could prevent site restoration are anticipated.

The transmission line and gas pipeline will probably be left in service for use in connection with other facilities.

Because the energy facility site is within an area zoned Light Industrial, the site will likely be restored to allow for other industrial uses. With the existing infrastructure, it may be advantageous to continue to use the site for power production. In this case, certain buildings and components of the Project may be retained, including possibly the steam turbines, cooling towers, warehouses and control rooms. The steam turbines and HRSGs could be replaced ("repowered"), or an alternative source of thermal energy production could be provided.

A second alternative for the site would be use for some other industrial purpose, possibly related to Lamb-Weston's operation. In general, this would require the dismantling and removal of most of the power production equipment—primarily the gas turbine/generators, HRSGs, steam turbine/generators, condensers, cooling towers, and most of the structures.

At the time of retirement, these activities will be conducted in compliance with all applicable laws and regulations applicable at that time. A decommissioning plan will be developed and implemented to restore the site to a useful state, depending on the anticipated use at that time. If

in the future the restoration of the site is expected to cost an extraordinary amount, Applicant will begin, five years prior to the Project's removal from service, to fund a reserve that would be available for site restoration.

Applicant expects to be obligated under the terms of the lease agreement for the site, to restore the site to a usable condition upon termination of the lease. Further, as described in Exhibit K, prior to the expenditure of a significant amount of funds on the project, Applicant will be required to demonstrate to the satisfaction of project lenders that Applicant has the financial capability to fulfill obligations to retire the Project and restore the site according to applicable laws.

Source of Funds for Site Restoration Upon Facility Retirement Prior to End of Useful Life -- Project Order Addendum 2 Paragraph II.F.6

Beginning in Year 10 of the Project's operation, Applicant will conduct an assessment annually of the expected remaining useful life of the Project and the cost of site restoration. If an any year the assessment concludes that the Project life will be shorter than the expected 30 years, Applicant will establish a site restoration fund and set a contribution schedule that will accumulate sufficient funds to restore the site at the then-expected decommissioning date.

If the project is taken out of service prior to the end of its useful life, proceeds from the salvage of equipment will be made available to restore the site, in addition to funds that have been collected for site restoration, if any. It is expected that the cost of site restoration (see below) will be offset by the salvage value of equipment if it is sold prior to the end of its useful life.

ESTIMATED COST OF SITE RESTORATION

Depending on the scope of facility removal and the nature of the next use of the site, the cost of site restoration is not expected to exceed $5 million in current dollars.

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AA

EXHIBIT AA

CITATIONS TO REGULATIONS AND REQUIRED PERMITS

INTRODUCTION

Under OAR 345-22-000(1)(b), the EFSC must determine that the Project complies with all other Oregon statutes and administrative rules applicable to the issuance of a site certificate for the facility. Under OAR 345-22-000(2), the Project Order is required to contain an inclusive list of such applicable statutes and rules. The Project Order states that:

> [t]he statutes and administrative rules listed in paragraphs 1 through 13 of this order shall be used by the Department of Energy and the Oregon Energy Facility Siting Council to review the application for a site certificate and determine whether or not a site certificate shall be granted.

Exhibit AA provides citations to state statutes and administrative rules and city ordinances with which Applicant must comply in constructing and operating the Project. This Exhibit also describes Applicant's compliance with applicable standards not discussed elsewhere in this SCA. Not withstanding the requirements under Exhibit AA, Applicant must comply with all federal, state, and local laws applicable to the project.

REGULATIONS - OAR 345-21-15(1)(aa)(A)

Table AA-1 lists statutes, rules, and ordinances that must be addressed for issuance of a Site Certificate, as identified in the Project Order, and the agencies which administer these regulations.

Table AA-1: Statutes, Rules, and Ordinances (Continued)

Regulations	*Administering Agency*
State Lands	
ORS 196.800 through 196.990	Division of State Lands
Building Codes	
ORS 447	Building Codes Agency
ORS 455	"
ORS 460	"
ORS 479.510	"
ORS 480	"
ORS 671	"
OAR 918-225	"
OAR 918-290	"
OAR 918-301	"
OAR 918-302	"
OAR 918-400	"
OAR 918-440	"
OAR 918-460	"
OAR 918-750	"
OAR 918-770	"
OAR 918-780	"
Natural Gas Pipeline and Transmission Line Safety	
ORS 757.035	Public Utilities Commission
ORS 757.039	"
ORS 757.541 through 757.571	"
OAR 860-24	"
OAR 860-28-005	"
Fire Protection and Hazardous Materials Safety	
ORS 453	State Fire Marshal's Office
ORS 476	"
ORS 479	"
OAR 837-40	"
OAR 837-90	"
Underground Storage Tanks	
ORS 466	Department of Environmental Quality
OAR 340-150	"

Noise	
ORS 467	Department of Energy
OAR 340-35-035	"
Radioactive Materials	
ORS 453.605 through 453.755	Oregon Health Division
OAR 333-100 through 333-119	"
Oversized Load Movement	
ORS 818.200	Department of Transportation
OAR 743-82	"

Agency:	**Department of Environmental Quality (DEQ)–Air Quality Division** 811 SW Sixth Ave Portland, OR 97204 (503)22-5359
Permit:	Air Contaminant Discharge Permit (ACDP)
Discussion:	Air Quality permitting requires acquisition of an Air Contaminant Discharge Permit. A copy of the application submitted to DEQ is included in Exhibit M.
Agency:	**DEQ–Water Quality Central Division** 811 SW Sixth Ave Portland, OR 97204 (503)22-5279
Permits:	Water Pollution Control Facilities (WPCF) Permit General Stormwater Discharge Permit for Construction Activities
Discussion:	A WPCF permit will be required for discharge of wastewater. The energy facility is anticipated to have a daily discharge of about 0.5~~1.0~~ million gallons. The project will utilize land application (crop irrigation) for disposal of effluent from the facility. A General Stormwater Discharge Permit for Construction is required to address erosion control for construction activity. Copies of the applications for both permits are included in Exhibit M.

Agency:	**Building Codes Agency** 1535 Edgewater NW Salem, OR 97310 (503)378-4133 700 SE Emigrant St. Pendleton, OR 97801 (503)276-7814
Permits:	Plumbing Structural/Mechanical/Energy Elevator Fire Marshall Electrical Pressure Vessel (Boiler)
Discussion:	The energy facility will be subjected to a rigorous structural and safety permitting process by the Oregon Building Codes Agency. The purpose of this process is to ensure adequate facility design for operational safety. Review by the Building Codes Agency will include structural, electrical, mechanical, plumbing and safety considerations. Design review and issuance of the necessary permits will be conducted through the Salem Office of the Building Codes Agency. The result of this review will be issuance of building permits, electrical permits and other plant operational component permits. The local office, in Pendleton, will be responsible for construction inspection of the Project during and upon completion of construction.

Local Permit Requirements

Agency:	**Umatilla County–Planning Commission** 216 SE 4th Pendleton, OR 98701 (503)276-7111
Permit:	Conditional Land Use Permit
Discussion:	The project facilities are located in Umatilla County. A Conditional Use Permit will be obtained for these facilities, with the exception of a portion of the electrical transmission line within the City Limits of Umatilla, to ensure compliance with local zoning and land use requirements. Compliance review will be conducted through the EFSC process, but the County will issue a Conditional Use Permit for the project based on conditions of the Site Certificate.
Agency:	**Umatilla County–Public Works Department** 216 SE 4th Pendleton, OR 98701 (503)276-7111
Permits:	Utility Permit Access Permit
Discussion:	Crossing of County roadways by pipelines or transmission line facilities will require acquisition of a Utility Permit. This requirement will also apply to any other "utilities" such as water supply pipelines. A permit will be required for each crossing point. An Access Permit will be required by the County for any temporary or permanent construction or modification to existing or previously

permitted access points. This process also includes review and potential requirement of yield/stop sign placement and culvert requirements.

Movement of oversize loads on public roadways is a joint permit between the State and the County. The State Department of Transportation issues the permit after incorporating any County agency concerns or conditions.