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FINAL
Environmental Impact Statement

WHITE PINE POWER PROJECT

1500 Megawatt Coal-Fueled Generating Facility
White Pine County, Nevada

Prepared by:

U.S. Department of the Interior
Bureau of Land Management
Nevada State Office
Reno, Nevada

State Director, Nevada

SUMMARY

[ ] DRAFT ENVIRONMENTAL IMPACT STATEMENT   [X] FINAL ENVIRONMENTAL IMPACT STATEMENT

Department of the Interior
Bureau of Land Management
Nevada State Office

1. Type of Action: [X] Administrative [ ] Legislative

2. Brief Description of Action:

White Pine County, Nevada Power Company, and Sierra Pacific Power Company propose to construct a 1500 megawatt coal-fueled, steam-electric generating facility in White Pine County, Nevada. The site is on 2250 acres of land currently administered by the Bureau of Land Management. The power transmission system will connect the facility with an existing station in northern Nevada by a 230,000 volt transmission line and with an existing station in southern Nevada by two 500,000 volt transmission lines. The water supply system will deliver water from well fields in White Pine County in buried pipelines to the site. The coal transportation system will deliver coal from mines in Utah, Colorado and/or Wyoming over existing, upgraded, and new railroad to the site.

3. Summary of Environmental Impacts:

Environmental impacts will occur on earth resources, air resources, water resources, ecological resources, cultural and paleontological resources, visual resources, and socioeconomics. Mitigative measures are available to reduce most impacts to insignificant levels. Long-term resource commitments include up to 25,000 acre-feet per year of appropriated groundwater. Irreversible commitments include the burning of approximately 140 million tons of coal.

4. Alternatives Considered:

Site alternatives, project alternatives, power transmission system alternatives, water supply system alternatives, and coal transportation system alternatives were considered as means of meeting project objectives.

5. Date of Availability to Environmental Protection Agency and Public:

Draft Environmental Impact Statement: October 20, 1983
Final Environmental Impact Statement: August 20, 1984

SUMMARY

The White Pine Power Project (WPPP) is a proposed 1500 megawatt coal-fueled, steam-electric generating facility to be located in White Pine County, Nevada. The project will be jointly owned by White Pine County, Nevada Power Company, and Sierra Pacific Power Company. Participants in the electrical output of the project (and their percentage entitlement share of electrical output) include the following eight Nevada entities and six California municipalities:

- <u>Nevada Entities</u> (49 percent)

  Boulder City (2.5 percent)
  Lincoln County Power District No. 1 (2.53 percent)
  Mt. Wheeler Power, Inc. (3.0 percent)
  Nevada Power Company (25.0 percent)
  Overton Power District No. 5 (2.53 percent)
  Sierra Pacific Power Company (10.0 percent)
  Valley Electric Association (2.44 percent)
  Wells Rural Electric Company (1.0 percent)

- <u>California Municipalities</u> (51 percent)

  Anaheim (3.621 percent)
  Burbank (1.938 percent)
  Glendale (1.836 percent)
  Los Angeles (39.117 percent)
  Pasadena (1.836 percent)
  Riverside (2.652 percent)

Because the proposed action consists of applications for use of federal lands, a Draft Environmental Impact Statement was prepared to assess the probable impacts from construction and operation of WPPP. Responses to comments

received during the review period have been incorporated into the Final Environmental Impact Statement. The Final Environmental Impact Statement and other available information will be utilized by the Bureau of Land Management to determine whether or not the project should be granted rights-of-way to use lands currently under federal jurisdiction.

NEED FOR THE PROJECT

The primary objectives of WPPP are:

- Provide capacity and energy as an integral part of generation resource planning thereby reducing the dependency on foreign oil and natural gas fuels.

- Provide economic development and diversification of industry in White Pine County thereby alleviating significant unemployment conditions.

For the Nevada participants, projections for 1983 through 1991 indicate that peak demand and energy annual growth will average about 3.5 percent and 3.4 percent, respectively. From 1991 through the year 2000, when WPPP is in operation, peak demand and energy annual growth are projected to average about 2.6 percent and 2.5 percent, respectively. Combined reserve margins (that is, additional capacity required in order to maintain system reliability) in the year 2000 would be 13 percent with WPPP and a negative one percent without WPPP.

For the California participants, projections for 1983 through 1991 indicate that peak demand and energy annual growth will average about 1.8 percent and 1.4 percent, respectively. From 1991 through the year 2000, both peak demand and energy annual growth are projected to average about 1.7

percent. Combined reserve margins in the year 2000 would be 14 percent with WPPP and 7 percent without WPPP.

Under the County Economic Development Revenue Bond Law (a provision of Nevada statutes), White Pine County can finance a power plant in order to enhance economic development. Since April 1978, the Kennecott copper mines in White Pine County have been closed. In addition, the Kennecott copper smelter in McGill has operated intermittently and is currently not operating. WPPP would provide economic recovery from the downturn caused by the closure of the copper mines and reduced smelter operation. WPPP would also help diversify the local economy.

DESCRIPTION OF THE PROJECT

The location of the WPPP Generating Station and major lineal facilities is shown on the Study Area map located in the map pocket. The preferred site for the WPPP Generating Station is the North Steptoe Valley Site which is located on 2250 acres of federal land in Steptoe Valley approximately 48 miles north of the City of Ely. WPPP includes four major systems.

The power generation system consists of two nominal 750 megawatt net coal-fueled, steam-electric generating units. Major components of the power generation system are the steam generators, steam turbine generators, air quality control equipment, plant cooling facilities, waste management facilities, and coal handling facilities.

The power transmission system consists of the Southern Transmission System and the Northern Transmission System, each of which includes transmission lines, access roads, stations, and a microwave or communication system. The Northern Transmission System will connect WPPP to the existing

Machacek Substation (near Eureka, Nevada) by a new 230,000 volt alternating current transmission line. The Southern Transmission System will connect WPPP with the existing McCullough Switching Station (near Las Vegas, Nevada) by two new 500,000 volt alternating current transmission lines.

The water supply system consists of well fields, buried pipelines with pumping stations, and a storage reservoir located on the site. For the preferred site, the estimated maximum annual water demand of 25,000 acre-feet per year will come from well fields in Steptoe Valley. The Nevada State Engineer granted water permits on August 17, 1983.

Approximately 140 million tons of coal will be required over the life of WPPP. The coal will come from existing and future coal mines in Utah, Wyoming, and Colorado and will be transported over existing mainline railroad systems to Cobre or Shafter in northern Nevada. New and upgraded railroads will be required from these "gateways" to the site. In addition to new and upgraded rail trackage, the coal transportation system includes rolling stock for unit train operation, and facilities for maintenance and repair of the rolling stock.

ALTERNATIVES TO THE PROJECT

A nine-month site selection study was conducted to select the preferred and alternative sites. Two-mile-wide study corridors were also selected for the transmission lines and railroad. (Actual right-of-way requirements will be 330 feet for the two 500,000 volt transmission lines, 150 feet for the 230,000 volt transmission lines, and 100 to 200 feet for the railroad.) In addition, alternative sources of generation were investigated.

Site Alternatives

The study region for the site selection study was defined as the area within White Pine County (approximately 8905 square miles). Exclusion criteria were applied to screen out areas where it would not be possible to site a power plant because of environmental and/or engineering constraints. A commuting time criterion was applied to the remaining areas to keep potential sites within a distance from existing population centers that would maximize the economic benefits to those centers and also attract plant personnel. This ultimately resulted in the identification of 25 candidate sites of ten square miles each.

The candidate sites were evaluated and ranked by comparing environmental impacts and economic costs. Highly suitable sites were then evaluated for licensability, and three alternative sites were selected. Based on a final comparison of environmental impacts and economic costs, the North Steptoe Valley Site was designated as the preferred site. The Butte Valley Site and Spring Valley Site were designated as alternatives to the preferred site.

Project Alternatives

Based on current forecasts, the WPPP participants need to obtain about 1530 megawatts of new base load capacity by 1995 in order to assure a reserve margin that will maintain system reliability. Table 1 includes alternatives to WPPP capacity and energy that were investigated along with a brief discussion of their ability to achieve the primary objectives of WPPP. None were feasible alternatives to WPPP either because they are not technically or economically feasible, or because they would not be available in the time-frame required for WPPP. Without WPPP (the no project alternative), reserve margins would be reduced to levels that could impact system reliability in both California and Nevada. This could result in regulatory agencies enforcing mandatory conservation measures. In addition, without WPPP there would be no economic benefit to White Pine County.

ENVIRONMENTAL SETTING

White Pine County is situated within a region characterized by north-south trending mountain ranges separated by deeply alluviated valleys. Maximum range elevations vary from about 7000 feet to 13,063 feet at Wheeler Peak. Elevations of the valley floors average from 5500 to 6500 feet. The landscape is characterized by open country, without dense vegetation or manmade development, that lends itself to wide and scenic vistas.

Local climate is influenced by the interior location, regional weather systems, and the north-south topographic orientation. The climate of White Pine County is semi-desert, characterized by aridness, clear skies, and wide daily ranges in temperature. Surface winds channeled by valleys are predominantly southerly or northerly. A significant amount of annual precipitation occurs in the form of snow during the winter months. In areas of high snowfall, snowmelt accounts for most of the surface water runoff and groundwater recharge. Current water use does not exceed perennial yield and no groundwater basins in White Pine County are being depleted.

The soils of White Pine County generally support sagebrush and shadscale communities which are characteristic of the valley floors. Pinyon-juniper woodland occurs at higher elevations. Terrestrial wildlife species in the area are characteristic of the local habitat, and include pronghorn, mule deer, wild horses, ferruginous hawks, golden eagles, sage grouse, and rattlesnakes. Aquatic species occurring in small streams and reservoirs include relict dace, cutthroat trout, and rainbow trout. Three threatened or endangered species (Pahrump killifish, Peregrine falcon, and bald eagle) have been observed in the area.

The pre-history of White Pine County includes settlements associated with the earliest evidence of human presence in the Great Basin. Later inhabitants were forebearers of the modern Shoshoni. Caucasians first entered the area during the 19th century. Permanent settlements began when mining and agriculture became the most significant industries in White Pine County.

White Pine County is currently in a social and economic transition due to the closure of the copper mines. Population has declined over 20 percent since 1970 and current leading employment sectors are government, trade, and service industries. Most of the housing was constructed before 1940 and could be marginally habitable. Local services have supported larger populations but some parts of the established infrastructure are in need of repair or replacement. The quality of life in White Pine County has historically been high although the satisfaction with life component is currently deteriorating due to economic conditions.

ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Baseline data were gathered and environmental impacts were evaluated in the following areas:

- Earth resources
- Air resources

- Water resources
- Ecological resources
- Cultural resources
- Visual resources
- Socioeconomics

The application of mitigative measures will reduce most environmental impacts to insignificant levels. These impacts are summarized in Table 2.

Earth Resources

Proper design of WPPP facilities will minimize erosion potential. Subsidence due to groundwater withdrawal will be minimal and localized around well fields.

Air Resources

Air emissions from the WPPP Generating Station will be below levels allowable in federal and state regulations. Compliance with these regulations will ensure that there will be no significant impact on ambient air quality.

Water Resources

The primary impacts on water resources will result from groundwater withdrawals to meet WPPP water requirements. (Potential impacts to groundwater quality will be mitigated by designed project facilities for "zero liquid discharge.") As a part of the water permits, WPPP will continue to participate in a groundwater and surface water monitoring program. The purpose of the program is to establish baseline data for current seasonal groundwater level fluctuations. The information from the monitoring program will be used to identify impacts before they become significant in order to apply the appropriate mitigative measure.

Ecological Resources

Impacts on ecological resources from groundwater withdrawals will also be mitigated as a part of the groundwater monitoring program. However, construction of WPPP facilities will impact soils, vegetation, and habitat. In addition, secondary impacts could result from increased human activity in the area. Two threatened or endangered species (Pahrump killifish and bald eagle) and three proposed species (Big Springs spinedace, White River spinedace, and White River springfish) inhabit the area.

Cultural Resources

Mitigative measures associated with cultural resource impacts are included in a Memorandum of Agreement. This agreement with the Advisory Council on Historic Preservation will serve as the focus for all cultural resource mitigation activities. When mitigation is required, its scope will be determined through negotiation as described in the Memorandum of Agreement. Paleontological resources and sites of concern to Native Americans will be managed in a similar manner.

Visual Resources

The introduction of WPPP will add new elements to the existing landscape, with the potential to alter the aesthetics or visual character of the region. For the most part, the WPPP facilities will be prominent and mitigation will be limited to architectural design that will reduce contrast with the surrounding landscape. Careful grading and landscaping will also be employed to shield the less prominent facilities.

Socioeconomics

Construction and operation of WPPP will affect the lives and interests of many people, including White Pine County residents, transient workers in-migrating from other areas, and visitors passing through White Pine County. The socioeconomic impacts will result primarily from new workers and new spending in White Pine County. Direct employment by WPPP will total 2345 persons during the peak year of construction and 530 persons during the operation period. At the peak of construction, the total population of White Pine County will be approximately 46 percent more than its projected level without WPPP.

The increased population will place an increased demand on housing, education, law enforcement, fire protection, health services, social services, transportation, water and sewer systems, local and outdoor recreation, and agriculture. There could also be impacts to various areas associated with the quality of life as perceived by local residents.

In order to assess the socioeconomic impact of WPPP and establish the necessary mitigation strategies to alleviate the adverse impacts, a community development program was instituted that included the participation by local residents over a two-year period. The community development program resulted in the preparation of an Impact Alleviation Plan.

The Impact Alleviation Plan will offset the financial demands that WPPP will place on the population of White Pine County. The plan is in the form of an agreement between WPPP and impacted entities and establishes a detailed process which was used to identify anticipated impacts and which can be used to negotiate and resolve future impacts.

CONCLUSION

In exchange for short-term and long-term impacts, electrical energy will be available to consumers in Nevada and California. Generation of electricity from coal will help conserve other fossil fuels. In addition to energy, employment and economic benefits will accrue to White Pine County as a result of the construction and operation of WPPP.

Table 1

Summary of WPPP Alternatives

Alternative	Objective: Economic Development in White Pine County	Objective: Capacity and Energy to WPPP Participants
1. Nongeneration Sources o Purchase of Capacity and Energy o Conservation	Does not provide economic development.	Significant amounts of power may not be available for purchase. Conservation has occurred and future conservation is already part of load forecasts. New generation is required to replace older fossil-fired units.
2. Existing Resources o Repowering or Upgrading o Postponed Retirement o Alternate Base Load Operation	No large generation units exist in the county.	Changes would primarily occur in existing older oil and gas units which should be replaced. Delays in units scheduled for retirement are included in resource plans.
3. Developed Resources o Hydroelectric Generating Facilities o Gas/Oil-Fired Generating Facilities o Nuclear Power Plants o Cogeneration	No major hydroelectric sites in the county. Other facilities could provide economic development.	No major hydroelectric sites are economically available for development. Gas and oil are not reliable long-term fuels for electric utilities. Nuclear power is feasible but uncertain at this time. Cogeneration is included in resource plans.
4. Developing Resources o Geothermal Energy o Solar Energy Conversion o Wind Energy Conversion o Solid Waste Energy Conversion o Coal Energy Conversion	Minimal resources exist in the county. Some economic development could be provided.	Feasible geothermal resources are included in resource plans. Other resources represent a diffuse energy source usually not compatible with base load generation. Large-scale technologies have not been demonstrated and the economics of present demonstration plants preclude their large-scale use.

Table 2

Summary of WPPP Impacts

	Butte Valley Site	North Steptoe Valley Site	Spring Valley Site	Power Transmission System	Water Supply System	Coal Transportation System
Earth Resources	Soil compaction during construction and modification of existing drainages could increase the potential for erosion.			Soil compaction and modification of existing drainages could increase the potential for erosion.	Groundwater withdrawal could cause minor subsidence in the vicinity of the well fields.	Soil compaction and modification of existing drainages could increase the potential for erosion.
Air Resources	Compliance with federal and state regulations will ensure that there are no significant impacts to ambient air quality.			NA	NA	NA
Water Resources	Solid waste disposal could impact groundwater quality in localized areas under the site for short periods prior to detection.			NA	Groundwater withdrawals will lower water table.	NA
Ecological Resources	Construction of facilities will remove soil and vegetation on the site, thereby reducing wildlife and livestock forage and habitat. The potential exists for invasion by weedy species in disturbed areas near the site. Construction activities and human encroachment will impact wildlife and aquatic habitats, including areas with sensitive species. Potential impact to threatened and endangered species.			Construction of towers and access roads will remove soil and vegetation. Potential impacts to raptors due to collision with facilities.	Potential for impacts to wetlands and sensitive aquatic habitat from groundwater withdrawal near well fields. Potential for change in vegetation from lower water table.	Construction of the railroad will remove soil and vegetation. Minor impacts to wildlife habitat.
Cultural and Paleontological Resources	High potential for inadvertent impacts to cultural resource sites. Generating Station will have a visual impact of moderate significance.	Moderate potential for inadvertent impacts to cultural resource sites. Generating Station will have a visual impact of high significance.	Moderate potential for inadvertent impacts to cultural resource sites.	Potential for inadvertent impacts in several corridor segments that cross areas with high potential for cultural resource sites and fossil-bearing deposits.	Potential for inadvertent impacts to cultural resource sites in Steptoe Valley.	Potential for inadvertent impacts to cultural resource sites in Steptoe Valley and Spring Valley.
Visual Resources			Generating Station will have a visual impact of moderate to high significance.	Highest visual impacts where transmission line is adjacent to highways.	Low visual impacts.	Low visual impacts except at higher elevations.
Socioeconomics	The County will experience a 46 percent increase in population during peak construction and a 13 percent increase in population during operation. Additional population could impact local services not included in the Impact Alleviation Plan. Increased human activity could impact dispersed recreation. Impacts to agricultural community will result from removal of grazing land.			NA	Groundwater withdrawal could impact agriculture.	Impacts to the agricultural community will result from removal of grazing land and interference with ranching activities.

NA = Not applicable.

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1.0 PURPOSE AND NEED FOR ACTION

The purpose of this chapter is to present information on the purpose and need for the proposed action, the White Pine Power Project (WPPP). A brief history of WPPP is also included.

1.1 HISTORY OF THE PROJECT

In early March 1978, representatives of the Los Angeles Department of Water and Power (LADWP) were contacted by business leaders from Ely, Nevada, regarding the possibility of siting a coal or nuclear power plant in the Steptoe Valley of White Pine County (County), Nevada (Figure 1-1). A formal presentation by County representatives was made on March 20, 1978, to LADWP and other southern California municipalities. The basis of the presentation was a report, prepared for Kennecott Copper Corporation (Kennecott) in September 1977, which made a preliminary evaluation of siting a nuclear power plant in Steptoe Valley.

The Kennecott role in siting resulted from its concern over the impact on the Ely area should local copper mines be forced to close. Over the years, the fortunes of Kennecott and the County have been tied to the price of copper on the world market. In February 1976, the open pit copper mines near Ruth, Nevada, were shut down for ten months. Mine operation was closed down again in April 1978. At the present time, ore production is economically marginal and it is not known if the mines will reopen. In addition, the Kennecott copper smelter in McGill, Nevada (McGill smelter) has been operating intermittently during 1982 and 1983, and is currently not operating.

The Kennecott report concluded that up to 6000 megawatts (MW) of electric generation could be supported from local water supplies in Steptoe Valley. A power plant would also help diversify the local economy.

After reviewing the 1977 report, representatives from LADWP met with political and business leaders in the County in April 1978 to discuss a proposed coal-fueled power plant. It was agreed that certain preliminary studies would be required before proceeding further. In August 1978, LADWP and the County entered into a formal agreement to undertake these preliminary studies. By October 1978, 14 utilities in California and Nevada had expressed interest in WPPP and subsequently agreed to share in the funding for the studies.

In addition to the studies, changes were also required in Nevada statutes. Under the existing County Economic Development Revenue Bond Law, Nevada counties could issue revenue bonds for the construction of facilities which would enhance the economic development of that particular county. In order to allow the County to finance a power plant, amendments were submitted during the 1979 legislative session. These amendments, which were signed into law in May 1979, approve a generating facility in the County up to a nominal rating of 1500 MW.

The preliminary studies, which covered air quality, water availability, biological sensitivity, and socioeconomics, were completed during summer 1979. The studies favorably concluded that there were a number of potential 1500 MW power plant sites in the County.

In October 1979, negotiations were begun for project agreements to provide short-term financing to fund siting and feasibility studies and to begin the local, state, and federal regulatory approval process. A Power Supply Development Agreement and a Development Work Agreement between the County and others were approved in October 1980. Under these agreements, LADWP is the Development Manager and is responsible for carrying out all planning studies, surveys, estimates, and other activities necessary to secure regulatory approvals and meet environmental procedural requirements. This Development Work includes the preparation of the Environmental Impact Statement (EIS).

1.2 NEED FOR THE PROJECT

As currently proposed, WPPP will be jointly owned by the County (81.33 percent), Nevada Power Company (NPC) (13.34 percent), and Sierra Pacific Power Company (SPPC) (5.33 percent). The proposed WPPP participants and their percent entitlement share of the project output are listed in Table 1-1. LADWP is the Development Manager and the Construction Manager. NPC will be the Operation Manager.

1.2.1 Objectives

The primary objectives of WPPP are:

- Provide capacity and energy as an integral part of generation resource planning thereby reducing the dependency on foreign oil and natural gas fuels.

- Provide economic development and industrial diversification in the County thereby alleviating significant unemployment conditions.

1.2.2 Need for Power

The amount of new generation required is determined through electric load forecasting. Resource planning is used to determine the amounts and types of resources required to meet projected electric loads, both reliably and economically. Both the estimated peak load and the energy requirement play an important role in making this determination.

Concern about rate of growth, effects on the environment, and the capability to site, finance, and construct generating facilities has resulted in utilities continuously improving electric load forecasting methods and obtaining a better understanding of the causes of load growth. The WPPP participants share this concern. Studies are conducted to assess the impact on electric loads by such factors as solar heating and cooling systems, cost of electricity and utility rate structures, energy conservation, and expected shortages of natural gas. However, uncertainties in forecasting still exist no matter how much data are collected or how sophisticated the approaches used may be.

Each of the participants has developed specific methods and techniques for forecasting electric loads in its service area. The current electric load forecasts of the WPPP participants for peak demand and energy are listed in Table 1-2 through Table 1-5. These tables also list actual growth since 1970.

For the Nevada participants, historical (1970-1983) peak demand and energy annual growth has averaged about 6.9 percent and 5.9 percent, respectively. Projections for 1983 through 1991 indicate that peak demand and energy annual growth will average about 3.5 percent and 3.4 percent, respectively. From 1991 through the year 2000, when WPPP is in operation, peak demand and energy annual growth are projected to average about 2.6 percent and 2.5 percent, respectively.

For the California participants, historical (1970-1983) peak demand and energy annual growth has averaged about 3.1 percent and 1.9 percent, respectively. Projections for 1983 through 1991 indicate that peak demand and energy annual growth will average about 1.8 percent and 1.4 percent, respectively. From 1991 through the year 2000, when WPPP is in operation, both peak demand and energy annual growth are projected to average about 1.7 percent.

In order to supply reliable electric service, sufficient generating capacity must be planned to provide adequate reserve margins. The reserve margin is the difference between the total anticipated generating resources and the expected peak demand. Electric utilities require a 15 percent to 25 percent active reserve margin in order to maintain system reliability. Table 1-6 lists the actual and projected reserve margins at time of peak demand for the WPPP participants. The table includes WPPP in the total capability of the participants.

For the Nevada participants, the combined reserve margins are estimated to be about 16 percent in 1992, the first year of full WPPP operation. The combined reserve margins will decrease to about 13 percent in the year 2000.

For the California participants, the combined reserve margins are estimated to be about 25 percent in 1992, the first year of full WPPP operation. The combined reserve margins will decrease to about 14 percent in the year 2000.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The purpose of this chapter is to present information on the proposed action, as well as alternatives to the proposed action. The description of the project is based on the selection of the North Steptoe Valley Site as the preferred site as discussed in Section 2.2.2.3. Information in this chapter is summarized from the WPPP Feasibility Report.

The proposed action consists of application for use of federal lands required for WPPP. The purpose of this EIS is to assess the probable impacts from construction and operation of WPPP. The EIS and other available information will be utilized by the U.S. Department of the Interior, Bureau of Land Management (BLM) to determine whether or not WPPP should be granted rights-of-way to use lands currently under BLM jurisdiction.

2.1 DESCRIPTION OF THE PROJECT

The term White Pine Power Project (WPPP) is used in two ways in the EIS. In the political sense, WPPP is the Project, defined under agreements with participants and owners, for which LADWP is the Development Manager and Construction Manager. In the physical sense as an electrical system, WPPP consists of a power generation system, a power transmission system, a water supply system, and a coal transportation system.

The power generation system includes most of the facilities that will be located on the WPPP site. When referring to the source of electrical power, the term WPPP Generating Station is used.

The power transmission system is composed of the Southern Transmission System and the Northern Transmission

System, each of which includes transmission lines, access roads, stations, and a microwave system. The WPPP switchyard, which is on the WPPP site, is part of the power generation system.

The water supply system includes well fields and water conveyance pipelines. The water supply reservoir, which is on the WPPP site, is also part of the water supply system.

The coal transportation system is composed of the Northern Transportation System (or the alternate Southern Transportation System), which includes new and upgraded railroad to the WPPP site. Railroad facilities on the site are part of the power generation system. Existing railroads from coal sources to specified "gateways" are not a part of WPPP.

2.1.1 Power Generation System

The location of the 2250-acre North Steptoe Valley Site is shown on Figure 2-1. The site is located in the northern part of Steptoe Valley approximately 48 miles north of the City of Ely. This portion of the valley is bounded on the east by the Schell Creek Range and on the west by the Cherry Creek Range. The elevation of the site is approximately 5900 feet. The ground surface slopes to the northwest at average slopes of 2.5 percent in the southeastern portion of the site and flattens to less than 0.5 percent in the northwest corner of the site.

The power generation system consists of two nominal 750 MW net coal-fueled, steam-electric generating units designed for base load duty with load cycling capability. Major components of the power generation system are the steam generators, steam turbine generators, air quality control equipment, plant cooling facilities, waste management facilities, and coal handling facilities. The site arrangement is shown on Figure 2-2.

The site arrangement provides adequate area for development of all ancillary facilities. The arrangement of the generating station, the cooling towers, and switchyard will provide: 1) logical construction and operation access; and 2) orientations which minimize effects of windblown particulates or drift. A prominent feature of the site layout is the coal unloading and storage area. Separate trackage spurs and loops are provided for delivery of construction and operation materials. Waste management areas have been located to minimize pumping and transportation costs. Space is provided for temporary construction facilities and staging and laydown areas. A landing strip for light utility-class jet aircraft and/or a helicopter landing area may be provided on the site.

2.1.1.1 Civil, Structural, and Architectural Systems

The site has sufficient land slope to provide for drainage around key facilities. Grading will be done to protect key areas. Drainage and flood protection can be accomplished by surface channels or ditches with culverts at road and railroad crossings. Non-contaminated site storm runoff from improved areas will be returned to natural drainage channels. Plant contaminated storm runoff will be collected and treated or evaporated.

Temporary construction facilities necessary for the construction of the power generation system and water supply system will be located at the site. The construction worker housing (CWH) facilities will consist of approximately 55 buildings and a recreational vehicle park. Additional information on CWH facilities is included in Section 2.1.5.

Concrete batch plants on the site will provide concrete for construction. Potential borrow areas of construction material are shown on Figure 2-3. Additional information on construction material is included in Section 2.2.6.2.

The construction water system, supplied by two wells on or near the site, will provide an adequate and reliable source of construction water. Portions of the construction water system will be incorporated into the permanent service water systems. Diesel-driven generators will initially provide power for construction trailers and water well pumps. Subsequently, transmission lines from the local utility system to the site will be constructed. Initial communication will be provided by temporary rural radio telephone equipment followed by installation of a permanent telephone system.

A rendering of the WPPP Generating Station is shown on Figure 2-4. Major buildings and structures are listed on the figure. The tallest structures will be the two 750-foot-high acid-resistant reinforced concrete stacks. Each stack will be marked and lighted in accordance with Federal Aviation Administration (FAA) regulations.

The architectural design theme of the buildings and structures will blend with the surrounding areas of the site in order to achieve a pleasing appearance. Furnishings will harmonize with the style, materials, and colors of the building interiors. Rough textured concrete, fluted metal siding, earth tone colors, landscaping, and scale will be incorporated in the architectural design theme.

Most landscaping will retain the existing flora of the site. A minimum amount of introduced vegetation will provide the transition from the natural environment to the newly constructed buildings.

The coal reserve storage pile will be sized to provide up to 90 days of plant operation from reserve coal. The coal reserve pile will be designed to collect and contain runoff in a separate basin for disposal by evaporation or for use in the ash handling system.

The solid waste landfill will cover approximately 300 acres. Approximately 13.6 million tons of fly ash and scrubber reaction products generated during the operation period will be disposed of in the solid waste landfill to a height of approximately 40 feet. Vertical separation, as well as a seepage barrier, will be provided between the bottom of the fill and the existing groundwater table. Runon to the landfill will be diverted by perimeter drainage ditches. The finished surfaces of the landfill will be sloped for positive drainage, capped with topsoil, and revegetated. Runoff from the landfill will be collected by drainage devices and disposed of by evaporation in a lined runoff basin.

The bottom ash basins will be designed to handle bottom ash, pulverized rejects, and economizer hopper ash. Nearly 2.9 million tons of these materials will be generated during the operation period. From 3 to 5 elevated bottom ash basins with a total surface area of 100 to 140 acres and storage height of approximately 20 feet will be required. The interior of the bottom ash basins will be lined to protect against seepage to the groundwater. Monitoring wells will be installed up and down the hydraulic gradient under the bottom ash basins to detect leakage.

The sanitary landfill will handle construction and operation refuse and wastes associated with the CWH facilities. Wastes disposed of in the sanitary landfill will be spread and covered with soil daily. Approximately 50 acres filled to a height of approximately 20 feet will be required during the operation period. The finished surfaces of the sanitary landfill will be sloped for positive drainage, capped with topsoil, and revegetated. Runon to the landfill will be diverted around the landfill by use of perimeter ditches. Vertical separation will be provided between the existing groundwater table and the bottom of the sanitary landfill.

Plant security will include fencing around the site boundary. Information on road access is included in Section 2.2.6.1.

2.1.1.2 Mechanical Systems

The WPPP Generating Station will be designed for two nominal 750 MW units with a common control room between the units. Identical equipment serving the same function will be used to ensure equipment interchangeability.

Coal will be transported by unit trains to the site and unloaded into a subgrade hopper via automatic discharge bottom dump hopper cars. The coal handling system will: 1) receive and unload the coal; 2) stockpile, reclaim, and blend the coal; and 3) deliver coal to the steam generator coal silos.

The steam generator will be a pulverized coal-fired unit with a dry bottom furnace and will use a balanced draft, single reheat, drum-type design. It will generate approximately 5,900,000 pounds per hour of main steam at 2515 pounds per square inch gauge and 1005 degrees Fahrenheit (°F) for the turbine generator to produce 820 MW at 100 percent load. The maximum continuous rating (MCR) of the steam generator will be sufficient to meet the steam demand of the turbine generator at valves wide open and five percent overpressure. For design purposes, the estimated gross power output at MCR is 890 MW.

The steam piping systems will convey main and reheat steam between the steam generator and the turbine generator. Bleed steam will be extracted from the turbine to the feedwater heaters and boiler feed pump.

The turbine generator will be a tandem-compound unit and will consist of a single flow high pressure turbine, a double flow intermediate pressure turbine, and two or three double flow low pressure turbines. The net plant heat rate at 100 percent load will be approximately 10,000 British thermal units (Btu) per kilowatt-hour. Each turbine generator will be matched by a suitable sized steam generator.

The draft system will provide combustion air to the steam generator and will remove the resultant flue gases for treatment in the air quality control systems before discharge through the stack. The draft system will be a balanced draft system for each steam generator unit and will consist of two primary air fans, two forced draft fans, two primary air heaters, two secondary air heaters, and four induced draft fans.

The air quality control systems will control particulates (fly ash) and sulfur dioxide (SO_2) in the flue gas. Lime spray dryers and fabric filters will be used. A calciner may be located on the site to produce lime from limestone for the dry scrubber. Oxides of nitrogen (NO_x) from the steam generator will be controlled using combustion controls.

The ash handling systems will collect and remove bottom ash and economizer hopper ash from the steam generator, pulverizer rejects from the pulverizer, and dry fly ash and scrubber reaction products from the fabric filter and air heater outlet hoppers. The systems will also transport bottom ash, economizer hopper ash, and pulverizer rejects to the ash basin and transport fly ash and scrubber reaction products to the dry fly ash silo. All waste products will be disposed of on the site.

The boiler feedwater systems will condense the turbine exhaust system, purify and deaerate the feedwater, provide regenerative feedwater heating, and pump water to the steam generator. The circulating water system will transfer the heat rejected by the main condensers and the equipment cooling water heat exchangers to the atmosphere using mechanical draft wet cooling towers.

Facilities on the site will be designed for "zero liquid discharge." Maximum reuse and recovery of wastewater is planned and there will be no effluent discharged from the site.

Blowdown from the steam generators will be treated by the makeup demineralizer and reused as makeup water to the steam generators. Wastewater resulting from the regeneration of the makeup demineralizer and condensate polishers will be neutralized in the neutralization basin and will be reused as makeup water in either the dry scrubber or the bottom ash handling system.

Miscellaneous chemical drains including chemical feed areas, chemical storage areas, and laboratory and sampling areas will be directed to the neutralization basin for reuse. Additional plant miscellaneous wastewater streams such as equipment washes and roof and yard runoff will be collected in a settling basin for reuse in either the dry scrubber or the bottom ash handling system.

Sanitary wastewater will be treated and reused in the bottom ash handling system. Steam generator wash and chemical cleaning waste streams will also be reused in the bottom ash handling system.

Cooling tower blowdown will be used as makeup water to the dry scrubber. Operation of the cooling towers will match the quantity of blowdown with the makeup demand of the scrubber and, therefore, there will be no net wastewater discharge. However, a wastewater holding basin (evaporation ponds) will be provided for storage of cooling tower blowdown during periods of transient plant operations when supply may exceed demand. Stored wastewater will be disposed of through reuse of makeup water to the dry scrubber or through evaporation in a wastewater holding basin.

Makeup water to the bottom ash handling system will be either evaporated or combined with the bottom ash in the bottom ash basins. Makeup water to the dry scrubber will either be evaporated with the flue gas or combined with the scrubber reaction products.

Input and output quantities associated with full load operation of the WPPP Generating Station are shown on Figure 2-5. These quantities are based on full load operation during peak summer months. The total economic life of each unit is 306,600 hours (35 years). During that time, each unit will operate 231,269 hours (including operation at partial load) and will be inactive 75,331 hours. During the first 20 years of operation, the average capacity factor (average load divided by capacity rating) will be 68 percent. The average lifetime capacity factor will be 63.2 percent and will result in an energy output of 145,730 million kilowatt-hours over the 35-year operating life of each unit.

2.1.1.3 Electrical Systems

The alternating current (ac) generator will be connected to a three-phase main transformer which will step up the generated voltage from 26 kilovolts (kv) to 500 kv. A high current generator breaker will be installed in the isolated phase bus between the generator terminals and the tap to the unit auxiliary transformer.

The auxiliaries power system will consist of two three-winding auxiliary transformers per unit at 26 kv - 6.9 kv - 4.16 kv three-phase which will be connected to the generator terminals by the isolated phase bus to provide normal operating and start-up power to the unit auxiliaries. Three voltage levels for the auxiliaries power system (6.9 kv, 4.16 kv, and 480 volts) will be used within the plant. Space will be provided within the plant for auxiliaries power system switchgear and secondary unit substation equipment.

The motor driven loads for each unit will be supplied from the unit auxiliary transformers with each of their 6.9 kv secondary windings connected to a large motor bus and the 4.16 kv secondary windings connected to a small motor bus.

The emergency power system will supply all loads required for safe shutdown of the units in the event of a loss of auxiliary power. The emergency power system will be composed of an emergency generator and switchgear, transfer system, direct current power systems, and uninterruptible power systems.

The lighting system will provide illumination of safe access to all plant and yard areas. Working areas will be lighted to provide maximum safety, working efficiency, and visual comfort for working personnel.

The communications system will include a dial telephone system, a public address system, an intercom system, and a radio page system. The intraplant system will cover the main plant, yard, switchrack, and coal unloading and handling areas. The plant telephone system will be connected to the local system for universal telephone service.

A plant grounding system will be provided to reduce shock hazard, protect equipment, and allow application of ground relay protection.

2.1.2 Power Transmission System

The power transmission system is composed of the Southern Transmission System and the Northern Transmission System, each of which includes transmission lines, access roads, stations, and a microwave or communication system. A schematic diagram of the power transmission system is shown on Figure 2-6.

The Northern Transmission System is that portion of the WPPP power transmission system which connects WPPP to the existing SPPC and Mt. Wheeler Power, Inc. transmission systems. The Northern Transmission System includes all of the facilities to deliver a combined total of 210 MW at 230 kv ac for SPPC, Mt. Wheeler Power, Inc., and Wells Rural Electric Company at the Machacek Substation near Eureka, Nevada.

The Southern Transmission System is that portion of the WPPP power transmission system that connects WPPP to the transmission systems of NPC and LADWP. The Southern Transmission System includes all of the facilities necessary to deliver a combined total of 1290 MW at 500 kv ac, for LADWP, the cities of Anaheim, Burbank, Glendale, Pasadena and Riverside, NPC, Boulder City, Lincoln County Power District No. 1, Overton Power District No. 5, and Valley Electric Association at the McCullough Switching Station.

2.1.2.1 Transmission Line Corridors

After evaluating all reasonable alternatives linking alternative WPPP sites to the participants' delivery points, two-mile-wide study corridors were selected. The study corridors associated with the North Steptoe Valley Site are shown on Figure 2-7. The figure also indicates the preferred corridor that has been selected for feasibility studies and environmental licensing.

The actual right-of-way width requirements will depend on the voltage and the number of circuits in the right-of-way. Two 500 kv ac transmission lines require a 330-foot right-of-way. A 230 kv ac transmission line requires a 150-foot right-of-way.

The preferred corridor for the Southern Transmission System is approximately 325 miles long and includes 13,000 acres, of which approximately 374 acres are private land. The preferred corridor for the Northern Transmission System is approximately 87 miles long and includes 1582 acres, of which approximately 16 acres are private land.

The corridor alignment for the Northern Transmission System is a combination of the WPPP and BLM preferences for this corridor as described in the Draft EIS. These preferences were combined to avoid difficult construction terrain and sensitive cultural resources, to shorten the length of the line, and to parallel the existing 230 kv ac transmission line, where feasible.

2.1.2.2 Transmission Lines

Towers for the 500 kv ac transmission lines will be freestanding, lattice-type, galvanized steel towers. The towers will support conductors arranged horizontally with a phase spacing of 35 feet.

Six general types of towers will be used. They are the standard suspension, heavy suspension, angle suspension, and three types of dead-end towers. A typical standard suspension tower, which will comprise about 90 percent of the towers used, is shown on Figure 2-8. Towers will range in weight from 12 tons to 19 tons for suspension towers and from 23 tons to 53 tons for dead-end towers. Approximately four towers per mile will be required.

Each phase will consist of a 2312 thousand circular mil aluminum cable, steel reinforced (ACSR) conductor. Each tower will have two groundwires. The 500 kv ac suspension hardware will consist of two strings of insulators per phase in a Vee configuration. The dead-end hardware will consist of four strings of insulators per phase.

Towers for the 230 kv ac transmission line will be either an H-frame wood pole structure or a free-standing lattice type galvanized steel tower. The towers will support conductors arranged in a horizontal plane with a phase spacing of 26 feet.

Four general types of towers will be used. They are the standard suspension, heavy suspension, angle suspension, and dead-end towers. A typical wood pole suspension tower is shown on Figure 2-9. The average span length will be approximately 900 feet. However, some span lengths could exceed 1100 feet.

Each phase will consist of a 1272 thousand circular mil ACSR conductor. Each tower will have two groundwires. The 230 kv ac suspension hardware will consist of one vertical string of insulators per phase.

Four footings will be required for each new steel transmission tower. Footings for the tower will be cast-in-place concrete piles. Where soil conditions make this type of footing impracticable, the footings will either be a pad footing or a rock bolt footing. The wood pole structure usually does not require concrete footings. However, selected backfill may be required to improve soil stability.

Access roads will consist of a main road running the length of the transmission line right-of-way with stub roads providing access to each tower. Existing public and private roads will be used wherever possible. New access roads will be constructed where suitable existing roads are not available. The preferred corridor for the Southern Transmission System will require approximately 328 miles of access roads of which 35 miles (200 acres) will be outside the right-of-way. The preferred corridor for the Northern Transmission System will require approximately 103 miles of access roads of which 9 miles (56 acres) will be outside the right-of-way.

2.1.2.3 Stations

The WPPP switchyard will be one terminus for both the Southern Transmission System and the Northern Transmission System.

The Southern Transmission System will terminate at the existing McCullough Switching Station located near Boulder City, Nevada. The station is jointly owned by LADWP (64.6

percent), NPC (31.6 percent), and the U.S. Bureau of Reclamation (3.8 percent). Because of the long length of the Southern Transmission System, an intermediate switching station located approximately midpoint in the transmission route could be required. This station would be located within the WPPP transmission line right-of-way.

The Northern Transmission System will terminate at the existing Machacek Substation (jointly owned by SPPC and Mt. Wheeler Power, Inc.) near Eureka, Nevada.

2.1.2.4 Microwave System

The microwave communication system configuration will include two new terminal stations. The microwave terminal stations will be located at the WPPP Generating Station and at the McCullough Switching Station. Repeater stations will be located between these stations.

A typical layout of a microwave repeater station is shown on Figure 2-10. All potential microwave sites are shown on Figure 2-7. Elevations and approximate locations are listed in Table 2-1. Potential sites are described below.

The Kimberly Peak Station Site is located at an existing approved electronic site located on BLM land approximately 11 miles west of Ely, Nevada. Power is now available at that site and the amount of new service line would be minimal. A short access road will be required from an existing road to the new facilities.

The Squaw Peak Station Site is located at an existing approved electronic site located on BLM land approximately two miles north of Ely, Nevada. Power is now available at that site and the amount of new service line would be minimal.

A short access road will be required from an existing road to the new facilities.

The Cave Mountain Station Site is located at an existing approved electronic site located on U.S. Forest Service (USFS) land approximately eight miles north of Majors Place. Power is now available at the site.

The Moorman Springs Station Site is located at an existing approved electronic site located on BLM land approximately 1-1/2 miles east of Nevada State Highway 318. Power is now available from an existing line along the highway. A short access road will be required from an existing road to the new facilities.

The Gap Mountain Station Site is a new station located on BLM land approximately 1/2 mile from Nevada State Highway 318. Power is now available from an existing line along the highway. A new access road, approximately a half mile in length and running southeast from the highway, will be required.

The Mount Wilson Station Site is located at an existing approved electronic site located on BLM land approximately 22 miles north of Pioche, Nevada. Power is now available at the site. Because all service lines are underground, the distance to an available service line is unknown. A short access road will be required from an existing road to the new facilities.

The Highland Peak Station Site is located at an existing approved electronic site located on BLM land approximately 7-1/2 miles southeast of Pioche, Nevada. Power is now available at the site although two hundred feet of new service line will be required. A short access road will be required from an existing road to the new facilities.

The South Delamar Lake Station Site is a new station site located on BLM land approximately 7-1/2 miles southeast of Alamo, Nevada. Power will be available at an existing line approximately 3 miles southwest of the site. Approximately five miles of access road will be required from an existing trail of which seven miles will need to be improved.

The Upper Arrow Canyon Station Site is a new station site located on BLM land. Power will be available at an existing FAA installation approximately 5 miles southeast of the site. Approximately 4 miles of new access road will be required from an existing road to the site.

The site for the Lower Apex Station has been located on topographic maps. However, no survey has been made to determine the feasibility of the site. Power is available near the site, but a new access road will have to be constructed.

The Black Mountain Station Site is a developed site located on BLM land approximately 2-1/2 miles southwest of Henderson, Nevada. Power is now available at the site and the amount of new service line would be minimal. An existing access road is available to the site.

The Eldorado Valley Station Site is a new station site located on BLM land approximately 12-1/2 miles southwest of Boulder City, Nevada. The station will consist of a 14-foot by 16-foot rectangular passive reflector and no power will be required. Approximately 1-1/2 miles of new access road will be required to the site.

The microwave system associated with the preferred corridor for the North Steptoe Valley Site includes the sequence of stations listed below:

- North Steptoe Valley Site
- Squaw Peak Microwave Station
- Cave Mountain Microwave Station
- Mount Wilson Microwave Station
- Highland Peak Microwave Station
- South Delamar Lake Microwave Station
- Upper Arrow Canyon Microwave Station
- Black Mountain Microwave Station
- Eldorado Valley Microwave Station
- McCullough Switching Station

2.1.3 Water Supply System

The water supply system consists of well fields, buried pipelines with pumping stations, and a storage reservoir located on the WPPP site. The water supply for the North Steptoe Valley Site will come from well fields in Steptoe Valley as shown on Figure 2-11. The estimated maximum annual water demand is 25,000 acre-feet per year (afy). A typical water budget during a normal year of operation is shown on Figure 2-12. Baseline monitoring, discussed in Section 4.1.3.3, is being conducted to determine the effects, if any, of future pumping associated with WPPP.

2.1.3.1 Well Fields

The results of pumping tests and groundwater investigations indicate that a supply of 25,000 afy can be obtained by well field development. The well fields will consist of at least two wells per well field in a single row configuration with a one-mile to two-mile space between each well. A typical well pump installation is shown on Figure 2-13. Facilities will be within a fenced area approximately 200 feet on a side. WPPP wells will be located at least one mile from existing wells.

The North Steptoe Valley Site will utilize water supplied by five well fields in Steptoe Valley. The pumping rate of each well will be 1250 gallons per minute (gpm). Water from the most distant well will be pumped via pipeline approximately 30 miles to the site.

The individual water wells will consist of drilled and cased wells. Well screens and sand packing in the water bearing formation will be necessary to reduce sand entrainment in the pumped flow. Sand accumulation will be controlled at the well or in the conveyance system.

2.1.3.2 Water Conveyance

Groundwater will be conveyed from the well fields to the WPPP site by a pipeline system. The discharge pipelines from individual wells will be connected to larger diameter collector pipelines serving groups of wells. Collector pipelines will increase in diameter up to 36 inches as more wells are connected. All pipelines will be buried with a minimum cover of four feet to provide protection from freezing and other hazards. Power lines will follow pipelines where feasible and existing roads will be utilized as much as possible. The power lines, pipelines, and access road together will constitute a utility corridor and will require 100 feet of right-of-way as shown on Figure 2-14. Equipment will be provided for monitoring and control at a control station at the site, as well as at the pump and well locations.

2.1.3.3 Water Supply Reservoir

A reservoir will be constructed on the site to store water conveyed to the site from the well fields. The purpose of the reservoir will be to insure an uninterrupted water supply in the event of a pipeline outage or other such emergency. The reservoir capacity will be approximately 795 acre-feet.

2.1.3.4 Electrical Systems

Low-voltage transmission lines will be constructed to provide power for operation and control of pump stations and well fields. The transmission lines will be constructed on treated wood poles and will support approximately 50 miles of 69 kv class circuit and approximately 40 miles of 15 kv class circuit. Poles for the 69 kv circuit will be 65 feet in length. Poles for the 15 kv class circuit will be 50 feet in length. Whenever possible, the 15 kv circuit will be constructed on the same pole as the 69 kv circuit. The poles will generally parallel the maintenance access road and pipeline corridors.

Equipment will be provided to control and monitor the various components of the water supply system from the WPPP Generating Station control room, as well as from the pump and well locations.

2.1.4 Coal Transportation System

The coal transportation system is based on delivery by rail from the north. The existing railroad systems and potential sources of coal are shown on Figure 2-15. New and upgraded railroads will be required from the Cobre and Shafter "gateways" to the site.

In addition to the new and upgraded rail trackage, the coal transportation system includes rolling stock for unit train operation, and facilities for maintenance and repair of the rolling stock.

Depending on the type of coal burned, approximately four to six million tons of coal will be required annually for WPPP. Coal will be transported by railcar to the site and unloaded via automatic discharge bottom dump hopper cars.

The coals which encompass the envelope of coal quality parameters available from potential sources are called the design coals. Five design coals have been selected which represent the range of coal which WPPP is expected to burn during operation. The design quality range is broad and will result in a flexible steam generator design. This will enhance the negotiating position with suppliers and will minimize exposure to risks to security and reliability of supply.

A composite coal was also established. This coal represents the typical quality of coal that is expected to be burned for at least the first 20 years of operation. The composite coal has a heating value of 10,530 Btu per pound, a sulfur content of 0.6 percent, and an ash content of 8.8 percent. These qualities were used both for calculating the amount of material that will be handled annually and for air quality licensing. Based on the composite coal, WPPP will burn approximately 140 million tons of coal over the operating life as shown on Figure 2-16.

A performance coal will be established at a later date for incorporation into the steam generator specifications and for use in equipment performance tests.

2.1.4.1 <u>Railroad Corridors</u>

After evaluating all reasonable alternatives linking the alternative WPPP sites to the gateways, two-mile-wide study corridors were selected. In some areas, the corridor width is reduced where constrained by narrow passes or Wilderness Study Area (WSA) boundaries.

The study corridors associated with the North Steptoe Valley Site are shown on Figure 2-17.

The preferred northern route from Cobre to the North Steptoe Valley Site will require 86 miles of railroad construction. Construction along the easterly alternate segment would add an additional two miles. The westerly alternate southern route would require 172 miles of railroad construction from Pioche to the North Steptoe Valley Site. The easterly alternate southern route would require 177 miles of railroad construction from Pioche to the North Steptoe Valley Site. The specific centerline alignment for the railroad and right-of-way will be determined during detailed design.

The railroad will require a minimum of 100 feet for right-of-way from the "gateways" to the WPPP site. Additional right-of-way width up to 200 feet will be required to accommodate construction of sidings and cut-and-fill slopes. Depending on future agreements, the right-of-way along the existing Nevada Northern Railway (NNRy) will be either within the NNRy right-of-way or offset approximately 150 feet in a new right-of-way.

Cobre and Shafter are the "gateways" for the Northern Transportation System. Pioche is the "gateway" for the Southern Transportation System. (It should be noted that, because of grades and current condition, it may be necessary to rehabilitate part of the Caliente-to-Pioche Branch south of the "gateway".)

2.1.4.2 Railroad

The railroad will consist of a single-line trackage, siding, and bad order track. Sidings along the alignment will be provided for meeting or passing of the trains. The sidings will be approximately 7300 feet long and parallel to the line at intervals of 10 to 15 miles. In addition, a 500-foot storage and bad order track will be provided at one or two key sidings.

The track structure for the railroad will consist of new rails, hardwood ties, and steel tie plates. The rail will be fastened to the tie using cut spikes with lock spikes used for hold downs.

The track structure will be supported by six inches minimum of ballast under the ties. The ballast shoulder will be 12 inches minimum. An average of six inches of sub-ballast will be furnished over the full width of roadbed section to provide a uniform bearing for the track load and also to provide a cover for the subgrade.

In general, the crossing of highways and paved roads provided. Drainage structures will normally be constructed with corrugated metal pipes. Culverts will also be provided where necessary for livestock or wildlife crossing.

Fencing will be provided along the right-of-way only in those areas where there are significant hazards to people, livestock, or wildlife. It is estimated that less than ten percent of the route will require fencing. Cattle guards will be provided at fences crossed by the rail line.

The best available visual, acoustical, electronic, and/or mechanical devices will be installed to ensure the safe operation of the railroad. The equipment will detect malfunctioning rolling stock, expedite switching, and provide communications between trains and control centers.

The railroad signalization and communication system will interface with the mainline carriers and users of common trackage. In addition, miscellaneous signs, milepost markers, and switches at passing tracks will be installed along the alignment.

Access roads will consist of a 12-foot unpaved or gravel-surfaced road within the right-of-way. Where possible, existing roads will be used outside the right-of-way.

2.1.4.3 Rolling Stock

The rolling stock for a unit train consists of locomotives, coal cars, and caboose. It is anticipated that WPPP will own the coal cars. The locomotives and caboose may be either owned by WPPP or the contract carrier.

Locomotives for the unit trains will be diesel-electric. Tractive effort booster units will be used to help obtain the necessary traction or dynamic braking required to ascend or descend long grades encountered along the route.

Depending on the source of coal, each unit train will have between 80 and 110 cars with each car having a capacity of 100 tons of coal. Approximately two unit trains per day during the week will be required to supply WPPP.

Each unit train will be equipped with a high visibility caboose, with a structural integrity for either being pulled or pushed through by the locomotives. The caboose will be equipped with an alerter system.

2.1.4.4 Maintenance Facilities

All normal maintenance functions will be headquartered at a shop complex at a site to be selected at a later date. The building will be equipped and sized to perform routine maintenance and repair on coal cars and railroad right-of-way maintenance equipment and, if owned by WPPP, locomotives, booster units, and cabooses.

Due to the isolation from any other railroad repair facility, the shop complex will have the capability of performing most maintenance functions. These include: 1) truck repair; 2) removing and installing diesel prime movers, generators, and traction motors; and 3) removing, repairing, and installing air compressor fuel systems, air systems, lube oil systems, electrical systems, and drawbars. Complete wheel turning and replacement equipment will also be provided.

2.1.5 Labor Requirements

The construction and operation of WPPP will require the employment of a large number of personnel new to the County. The estimated labor force required for the construction and operation of the power generation system and water supply system is listed in Table 2-2 by major skill categories. The estimated peak labor force is estimated to be 2610 workers with the permanent operating force being approximately 530 people. The project labor force requirement in Table 2-2 is listed by quarters and assumes that construction will begin in the second quarter of 1986.

Generally, the installation of the construction facilities will be phased to accommodate the changing personnel, material, and equipment needs. Phase I will consist of the initial facilities to accommodate site preparation and similar early construction activities. This phase will commence at the beginning of the construction period and last approximately one year. Phase II will encompass the remainder of the construction period.

When economically feasible, construction facilities will be incorporated into the permanent plant systems and these facilities will remain during operation.

During Phase I, a limited number of workers will require housing accommodations at the WPPP site. These workers will be accommodated by early construction of part of the CWH facilities, chemical toilets, and potable water from site wells.

During Phase II, the CWH facilities will be designed to accommodate the increasing number of personnel and will ultimately utilize 45 acres for approximately 55 buildings capable of housing 700 people in addition to the recreational vehicle park, which will be expanded to accommodate 250 people. In this second phase, the CWH facilities will have separate sewer and water supply lines with the water system supplying water both for drinking and for fire protection.

After construction, the CWH facilities may be used to house temporary maintenance workers or workers involved in major overhauls which typically last for 3 months every 5 years and involve 200 to 300 people.

The projected labor force to construct the power transmission system and the coal transportation system has not been estimated in detail. Based on previous projects, there will be a relatively small number of workers required and they will be spread over the length of the transmission line and railroad. This labor force will probably be hired from various local labor groups in the particular area where work is being done. It is not anticipated that any problems will be encountered in attracting the necessary work force.

2.1.6 Project Schedule and Costs

The original schedule for WPPP assumed that construction would begin in the first quarter of 1985. However, because of new State of Nevada Public Service Commission (PSC) licensing requirements enacted in 1983 and because Nevada participants were indicating a decreased need for power in the late 1980s, the WPPP Management Committee in October 1983 approved a two-year delay in scheduled commercial operation dates.

The current schedule for WPPP is based on receiving all major permits and executing Power Sales Contracts by the second quarter of 1985. Following the first bond sale, construction activities can begin. Commercial operation of Unit 1 is currently scheduled for mid-1991. Commercial operation for Unit 2 is currently scheduled for mid-1992.

The total capital requirements (excluding financing and interest during construction) in January 1983 dollars to design and construct WPPP is estimated at approximately $2.5 billion for the North Steptoe Valley Site. The estimated levelized cost of electrical energy at the WPPP Generating Station switchyard is approximately 67 mills per kilowatt-hour.

2.1.7 Licensing Requirements

The licensing requirements (authorizing actions) that will (or may) be required by federal, state, and local authorities for WPPP are listed in Table 2-3. It should be noted that specific authorizing actions will depend on the site and routes that are selected and may not be applicable to all three WPPP sites or associated lineal facilities.

Table 2-3 lists the authorizing agencies and authorizing actions by WPPP systems and features. The WPPP systems and features identified are: 1) power generation system (including buildings, mechanical and electrical systems, coal handling facilities, site preparation, waste management, and emission control systems, but excluding the aircraft landing area); 2) power transmission system (including towers, conductors, switching stations, and on-site switchyard, but excluding the microwave system); 3) water supply system (including water wells, pump stations, pipelines, appurtenances, reservoir, distribution system, and water treatment equipment); 4) coal transportation system (including construction, alteration, elimination or changes to railroad, coal transportation, and rail cars); 5) highways and access roads; 6) microwave system (including microwave stations, transmitters/receivers, and repeaters); and 7) aircraft landing area (including runway, navigational aids, and servicing facility.

As a result of Senate Bill 161, which was enacted during the 1983 Nevada legislative session, regulated Nevada electric utilities (NPC and SPPC) must supply a resource plan by July 1 of every even numbered year. The plan must contain forecasts of future demands and the best combination of sources of supply to meet the demands or the best method to reduce the demands. The adequacy of the plan will be subject to a public hearing after the plan is filed. After the hearing, the PSC will make determinations based on the following:

a. Whether the utility forecast requirements are based on substantially accurate data and an adequate method of forecasting.

b. Whether the plan identifies and takes into account any present and projected reductions in the demand for energy which may result from measures for conservation and management of loads in the industrial, commercial, residential, and energy producing sectors of the area being serviced.

c. Whether the utility plan shows an adequate consideration of conservation, load management, pooling of power, purchases of power from neighboring states or countries, facilities which operate on solar or geothermal energy or wind, and facilities which operate on the principle of cogeneration or hydrogeneration.

After a utility has filed its plan, the PSC will issue an order accepting the plan as filed or specifying any portions of the plan which it deems to be inadequate. The PSC has scheduled the issuance of the order on adequacy for December 17, 1984.

The PSC cannot grant a permit for WPPP unless it finds and determines:

a. The basis for the need of the facility.

b. The nature of the probable impacts.

c. That the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives and other pertinent considerations.

d. That the location of the facility as proposed conforms to applicable state and local laws and regulations.

e. That the facility will serve the public interest.

f. That, if the facility or a part thereof is intended to meet the electricity requirements of Nevada customers, it is included in the utility resource plan.

The level of participation in WPPP by NPC and SPPC will depend on the adequacy of their resource plans as determined by the PSC.

2.1.8 Interrelated Projects

Several major projects (either existing or proposed) are in the general vicinity of WPPP. The status and relationship of these projects to WPPP is summarized below:

- Intermountain Power Project (IPP) - IPP is a two-unit, 750 MW coal-fueled generating station currently under construction near Delta, Utah, approximately 154 highway miles east of Ely, Nevada. Unit 1 is scheduled for commercial operation in July 1986. During early WPPP studies, a 230 kv ac transmission intertie between IPP and WPPP was under consideration. However, the proposal was subsequently eliminated.

- North Valmy Generating Station - SPPC is nearing completion of a two-unit, 500 MW coal-fueled power plant in Humboldt County near Valmy, Nevada. There is no connection with WPPP.

- Harry Allen Generating Station (HAGS) - The proposed project to construct a four-unit, 2000 MW plant 25 miles northeast of Las Vegas has been deferred until the mid-1990s. The original WPPP power transmission system included a transmission intertie with HAGS. The power transmission system now terminates at McCullough Switching Station.

- Thousand Springs - Thousand Springs, a 1500 MW to 2000 MW coal-fueled generating station proposed by SPPC in Elko County, has been deferred until the 1990s.

- M-X Program - The Department of the Air Force considered areas in the County and in Lincoln County as proposed locations for shelters and operating bases associated with the M-X missile. These areas were dropped from consideration in 1981.

- Aquatrain Project - Aquatrain is a proposed staged project that would include a liquid carbon dioxide slurry pipeline for delivering coal near the WPPP site. WPPP is not a part of this proposal.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

2.2.1 Project Alternatives

Based on current forecasts, the WPPP participants would need about 1530 MW of additional new base load capacity by 1995 to achieve a reserve margin of 25 percent. This section discusses alternatives to WPPP capacity and energy, as well as the consequences of cancellation of the project.

2.2.1.1 Nongeneration Sources

2.2.1.1.1 Purchase of Capacity and Energy

All of the WPPP participants are currently purchasing peaking or emergency energy from other sources. In addition, most of the WPPP participants are currently purchasing base load energy and would continue to do so after WPPP is in operation. If available, the purchase of additional base load capacity that could replace WPPP capacity over its expected lifetime would be an economic decision that would be made by the WPPP participants prior to committing to participation.

2.2.1.1.2 Conservation of Electrical Energy

Since the oil embargo of 1973, energy conservation has received greater emphasis as a means of postponing, or as an alternative to, construction of new electric generation facilities. The predicted average annual electrical energy growth rate for the WPPP participants for the next 12 years is approximately 2 percent. This compares to a 3.3 percent rate of growth projected by the Energy Information Administration for the United States for the same period. A major cause of the forecast growth rate being lower than the national average is the conservation programs being implemented by the WPPP participants.

Voluntary conservation has caused the forecasted electrical energy growth rate to decline in recent years. The

WPPP participants have also instituted utility sponsored conservation programs which have caused a further reduction in the forecast load growth. The reduced forecast for the growth rates of system annual peak demands are based on the assumption that consumers will continue to take voluntary energy conservation measures and that utility sponsored programs will continue to be effective.

Some of the WPPP participants began efforts to encourage energy conservation as early as 1969. These efforts, and others incorporated into utility programs since that time, include such measures as:

a. Providing consultation services to consumers, architects, and engineers regarding the most efficient ways of utilizing electrical energy.

b. Suggesting designs of buildings and installation of equipment to optimize energy conservation.

c. Conducting systems analysis studies for customers to ensure optimum utilization of energy.

d. Providing information and recommendations on peak load controlling devices and on power-factor correction.

e. Working with elected officials and state agencies to develop useful laws and codes to eliminate wasteful energy practices.

f. Using load management on residential air conditioners.

g. Participating in the development of energy conservation programs for various states and the nation through representation on the Federal Power Commission Technical Advisory Committee on Energy Conservation, and through memberships in the Electric Power Research Institute, the American Public Power Association, and other organizations.

Since 1975, all WPPP participants have instituted conservation programs. The effects of such conservation programs are included in forecasts of peak demands and energy requirements. The WPPP participants are convinced that the load forecasts are justified and that all energy conservation efforts reasonably likely to occur have been included in the forecasts. Implementation of additional conservation programs that are not cost-effective when compared to WPPP energy do not represent an alternative to WPPP.

2.2.1.2 Existing Resources

2.2.1.2.1 Repowering or Upgrading

The requirements for new generation can sometimes be postponed or eliminated through increased use of existing capacity by repowering existing oil-fired or natural gas-fired generating units or operating existing plants at a higher output. However, many of the older units in the systems of the WPPP participants are operated as intermediate units and are already rated at their maximum capacity to meet system reliability requirements or to provide adequate resource capacity to meet generation system daily requirements. Therefore, upgrading of existing units, even if feasible, would provide minimal additional capacity and energy. It should be noted that, for some of the WPPP participants, older units are used as little as possible in order to decrease oil consumption, reduce emissions, and decrease production costs.

In repowering, the existing generating facility is converted into a combined-cycle generating facility by adding combustion turbines with waste heat recovery boilers. The use of exhaust gases from the combustion turbines produce additional steam to drive existing steam turbines. This conversion could provide intermediate generation, but would not provide additional economic base load generation. The reliability of the repowered oil-fired and gas-fired units would also be dependent on availability of oil or natural gas supplies, which is not a feasible alternative as discussed in Section 2.2.1.3.2.

2.2.1.2.2 Postponed Retirement

There are no retired units within the systems of the WPPP participants that can be recommissioned for use. At the present time, all of the WPPP participants with existing generation are considering delaying, or have already delayed, retirement of older units in order to provide sufficient operational capacity during system emergencies. However, even if the retirement of some of the older units is postponed, WPPP would still be needed to provide base load generation.

2.2.1.2.3 Alternate Base Load Operation

Most peaking and intermediate units operated by the WPPP participants are oil-fired or natural gas-fired generating facilities that operate at low capacity factors because other more efficient units are available. Changing their status to base load units would require increased use and dependence on oil or natural gas resources and would significantly increase fuel costs. Base load operation could also cause a significant increase in maintenance requirements on these older units, thereby reducing system reliability.

2.2.1.3 Developed Resources

2.2.1.3.1 Hydroelectric Generating Facilities

There are few remaining sizable hydroelectric dam sites available to the WPPP participants for possible development. Some of the WPPP participants have potential pumped storage sites in their service areas. However, these facilities are for peaking rather than base load generation.

It has been estimated that the proportion of hydroelectric generation nationally could be increased by 50 percent of its current level. The additional hydroelectric generation would require the use of scenic areas, such as the Grand Canyon on the Colorado River, for storage reservoirs. Numerous small hydroelectric sites are located around the United States. However, only a small number of these sites are available to the WPPP participants.

The development of hydroelectric resources is expected to provide a small part of the generating capacity required by the WPPP participants in their resource plans. The development of substantial additional hydroelectric resources is considered unlikely and, therefore, this resource is not a feasible alternative to WPPP.

2.2.1.3.2 Gas/Oil-Fired Generating Facilities

One of the essential requirements of base load generation is the long-term availability of fuel. Currently, utilities in the Southwest have sufficient supplies of natural gas for their existing gas/oil-fired generating units. However, this situation is expected to be temporary and use of natural gas in conventional generating units is projected to be curtailed by the end of the 1980s as supplies become scarce. Therefore, the use of natural gas in conventional base load generating facilities is not a viable alternative to WPPP.

Use of fuel oil in conventional gas/oil-fired generating units has similar problems. Supplies of domestic low sulfur fuel oil are limited. The supplies of foreign oil are more abundant, but world political instabilities make foreign oil supplies vulnerable. Although the price of fuel oil has dropped slightly due to the current overproduction of world crude oil, the long-term trend is for the cost of oil to escalate substantially as supplies eventually become scarce. These factors limit the potential for fuel oil as an alternative to WPPP.

Synthetic and liquefied natural gas were both eliminated as alternative fuels because of uncertainties associated with long-term availability in large quantities and the expected high costs of these fuels.

2.2.1.3.3 Nuclear Power Plants

Participation in nuclear power plants is being pursued by some of the WPPP participants. Additional nuclear power is not currently feasible because of increasing capital costs and the uncertainties related to licensing lead time and the receipt of operating licenses.

2.2.1.3.4 Cogeneration

The development of cogeneration resources is expected to provide a small part of generating capacity as forecasted by the WPPP participants in their resource plans.

The development of substantial additional cogeneration resources is considered uncertain at this time and is not a feasible alternative to WPPP.

2.2.1.4 Developing Resources

2.2.1.4.1 Geothermal Energy

Geothermal resources are known to exist in California and Nevada. Many of the WPPP participants are actively involved in geothermal energy as a potential source for generating electricity. The resources being explored, tested, and developed by the WPPP participants are hot water resources.

LADWP, along with the cities of Burbank, Pasadena and Riverside, are participating in a 10 MW demonstration unit located in Imperial County near the town of Brawley, California. This facility, which went into operation in July 1980, is a research and development project. It has not yet been demonstrated whether it is possible to produce electricity economically and reliably from this geothermal resource. In addition, there are serious questions concerning the availability of cooling water, potential for subsidence, and feasibility of additional transmission lines in the Imperial Valley. The Brawley field could provide the California WPPP participants with an estimated potential yield 450 MW.

Geothermal development activities in Inyo County are in a preliminary study and exploration stage. The potential yield from the area could be 200 MW for LADWP. The majority of electricity from the Imperial and the Inyo county resources is not expected to be available until the 1990s.

SPPC has executed contracts to purchase a total of 24 MW from three Nevada geothermal resources. These include: 1) 10 MW from the Big Smokie Valley resource, scheduled for 1985-86; 2) 9 MW from Desert Peak, scheduled for 1986; and 3) 5 MW from Steamboat, scheduled for late 1985.

Progress is being made to demonstrate technical and economic viability of geothermal hot water energy as a source for generating electricity. However, there is insufficient experience to rely on this resource with a high degree of confidence because the characteristics of the resource are site specific.

2.2.1.4.2 Solar Energy Conversion

Studies have indicated that the area served by the WPPP participants is one of the more favorable regions in the United States for the application of solar-electric generation. Several of the WPPP participants are actively supporting research to accelerate the development of this technology. To assist in the development of solar energy, solar insolation data are being measured extensively throughout the service areas of western utilities.

The primary development in solar-electric generation is thermal conversion which collects sunlight and transfers heat to a working fluid to generate electricity or provide thermal energy. Solar thermal conversion may become an alternative means of generating peak and intermediate electric power in the 1990s in the southwestern United States if research, development, and demonstration programs are successful. However, it is not expected that these technologies will become commercially or economically available for large-scale base load application in the time frame required for WPPP.

2.2.1.4.3 Wind Energy Conversion

Wind energy conversion could supply a limited part of the energy requirements of the WPPP participants in the 1990s if wind turbines with proven reliability become available at reasonable costs. Wind resource areas have been identified in both Nevada and Southern California. The installation of small wind turbines by entrepreneurs is currently economical to third-party investors due to substantial tax benefits not available to electric utilities.

Because wind energy is an intermittent, non-dispatchable resource, it is expected to primarily displace fuel consumption at conventional power plants rather than displace new power plant capacity. Therefore, wind energy conversion is not considered a feasible alternative to WPPP.

2.2.1.4.4 Solid Waste Energy Conversion

Although large quantities of combustible solid waste are produced in the service areas of the WPPP participants, it requires approximately 1000 tons (the amount of solid waste produced in a day by a city of 400,000 people) to produce 20 MW of capacity. In addition, market penetration for solid waste electrical generation has been severely restricted by air pollution restrictions, ash disposal problems, high capital cost and interest rates, poor or nonexistent markets for recovered materials, and the availability of low competing landfill disposal costs.

Liquid or gaseous fuels produced from solid waste may become a feasible alternative in the future if the technology is proven and process costs decrease sufficiently to be competitive with other fuels. If liquid and gaseous solid waste fuels were used in the future, they probably would displace oil or natural gas fuels in existing boilers which cannot be base loaded. Therefore, solid waste is not considered a feasible alternative to WPPP.

2.2.1.4.5 Coal Energy Conversion

Efforts are being made by the Department of Energy (DOE), the Electric Power Research Institute, and others to develop a technology to produce relatively clean synthetic fuels from western coals. The resulting clean, low or intermediate energy gas, liquid, or solid fuels could be used in traditional or advanced fossil-fueled generating facilities.

Most advanced of the processes is the solvent-refined coal (SRC) process in which coal is partially hydrogenated and solvent extracted to yield a solid (SRC-I) or liquid (SRC-II) fuel low in sulfur and ash. Although chemically and physically somewhat different from raw coal or refined petroleum, these products can be acceptable power plant boiler fuels in terms of current emission standards and production costs. Pilot-plant production and test burning of these fuels have been performed successfully. However, SRC-I is being phased out by DOE and SRC-II has been cancelled. The major unresolved questions relate to costs and the adequacy of the lowered sulfur content to meet future air quality standards and environmental regulations. The clean liquid fuels should be acceptable, but the clean solid fuels may not meet those standards without additional air quality control equipment.

Coal gasification can be accomplished in moving bed, fluidized bed, or entrained bed reactors. Several gasifiers are under development. Most of these developmental and commercial gasifiers appear capable of producing a clean gas fuel that can be used in combined cycles. A 100 MW combined cycle coal gasification demonstration program began construction in December 1981, at Daggett, California. Construction should be completed by June 1984 and a 6-1/2-year test program has been planned to test various coals. The uncertainty of pollution control equipment needed to meet air quality requirements does not permit reasonable estimates to be made of the economics of a commercial facility.

Experience to date indicates that the availability of coal conversion technology on the scale and time frame required for WPPP cannot be considered likely. Therefore, coal conversion is not considered a feasible alternative to WPPP.

2.2.1.4.6 Other Developing Energy Technologies

Other developing energy technologies (such as fuel cells, fluidized bed combustion, ocean thermal energy conversion, fusion, and magnetohydrodynamics) are not expected to have significant commercial applications within the next ten to twenty years and are not considered feasible alternatives to WPPP.

2.2.1.5 No Project Alternative

If WPPP were cancelled, the power generating reserve margins of the WPPP participants would be reduced or eliminated. The reserve margins of the WPPP participants without WPPP are listed in Table 2-4.

For the Nevada participants, combined reserve margins without WPPP would range from only about 3 percent in 1992 to about a negative 1 percent excess in total peak demand over total capacity in 2000. For the California participants, combined reserve margins without WPPP would range from about 18 percent in 1992 down to about 7 percent in the year 2000. Overall, combined reserve margins for the WPPP participants would be about 14 percent in 1992 and about 4 percent in the year 2000.

In order to meet minimum reserve margin requirements, the WPPP participants would need to purchase power from other utilities, not only during maintenance operations or contingencies, but for firm peak load. In order for WPPP participants to meet projected demands, power from other sources would be required. Several projects are in various stages of planning but most are fully subscribed for projected base loads.

Most WPPP participants promoted voluntary conservation measures during the "energy crisis" in 1974 and savings as high as 25 percent were realized by some power consumers. These measures proved economically advantageous, especially with commercial users, and are still being practiced. However, it is unlikely that considerable additional energy savings could be realized through voluntary conservation measures.

Regulatory agencies could enforce extreme conservation measures even resorting to revolving blackouts (i.e., a certain part of each service area would be without power for part of each day). Cancellation of the WPPP could bring about such mandatory conservation measures.

In addition, if WPPP were postponed, the economic benefit to the County would disappear. This would also prevent economic recovery from the downturn caused by the closure of copper mines and reduced smelter operations in the area.

2.2.2 Site Alternatives

A nine-month Site Selection Study was conducted in 1981 in the following three sequential stages:

- Identification of Candidate Sites
- Evaluation of Candidate Sites
- Selection of preferred and alternative sites

The first two stages are discussed in the Site Recommendation Report. The third stage is discussed in the Site Selection Report.

2.2.2.1 Site Recommendation

2.2.2.1.1 Candidate Site Identification

The Study Region for the Site Selection Study was defined as the area within the County (approximately 8905 square miles) and exclusion criteria were applied to screen out areas in which it would not be possible to site a power plant because of environmental and/or engineering constraints. The exclusion criteria included land use, potential wilderness areas, land slope greater than ten percent, and unique geological features.

The areas remaining after applying the exclusion criteria were divided into 58 Candidate Areas of approximately 100 square miles each. A commuting time criterion was then applied to keep potential sites within a distance from existing population centers that would maximize the economic benefits to those centers and also attract plant personnel. As a result of applying the commuting time criterion, the number of Candidate Areas was reduced to 34.

The final refinement to reduce the amount of land to be investigated was locating Candidate Sites of ten square miles each within Candidate Areas. Due to constraints in some of the Candidate Areas, the number of Candidate Sites that could be located was reduced to 25. These 25 Candidate Sites are shown on Figure 2-18.

2.2.2.1.2 Candidate Site Evaluation

The Candidate Sites were evaluated and ranked by comparing the groups of criteria. These criteria, which include basic parameters by which site suitability can be measured, are:

a. Environmental Impacts - The impact of all components of the project on the environment (including the socioeconomic environment).

b. Engineering Costs - The costs related to the construction and operation of the project.

The criteria related to environmental impacts were selected based on their relevance to the Study Region and the types of impacts that are likely to occur. These criteria are:

- Air quality impacts
- Water resource impacts
- Land surface impacts
- Ecosystem impacts
- Cultural resource impacts
- Socioeconomic impacts

Engineering costs (including capital and operating and maintenance costs) were calculated for facilities which would be required in addition to facilities that would be common at any Candidate Site. These differential engineering costs were related to the lineal facilities for the following:

- o Power transmission system
- o Water supply system
- o Coal transportation system
- o Road access

Because the final design and configuration of WPPP had not been determined, the environmental impact and engineering cost analyses were performed for 12 project scenarios. These scenarios were based on the air quality (Steptoe Valley classified as nonattainment for SO_2 with emission offsets available or reclassified as attainment and no emission offsets required), the power transmission system (three schemes, depending on power delivery to California participants), and the coal transportation system (railroad delivery from the north or from the south).

The air quality impact evaluation emphasized the effect of dispersion potential as the most critical factor in the siting process. In addition, the two air quality scenarios were evaluated. In the nonattainment scenario, proximity to the nonattainment area was also considered.

The groundwater impact evaluation considered the impacts on the hydrologic environment from excessive withdrawals of groundwater. In general, valleys with large storage capacities and perennial yields also had other established users. The impacts were related to the displacement of these users due to project water consumption.

The land surface impact evaluation included the temporary disturbances to the land surface and, in some cases, the permanent removal of vegetative cover. The latter could accelerate the erosion of soil surfaces by wind and water.

The ecosystem impact evaluation was related to plant ecology, wildlife ecology, soils, and aquatic ecology. The evaluation considered the occurrence of threatened and endangered species, the occurrence and distribution of other important species (and their crucial habitats), and the occurrence of unique ecosystem impacts.

The cultural resource impact evaluation considered the significance of archaeological and historical sites. Impacts were measured based on the variety, quantity, integrity, clarity, and research potential of the data present, and on the local or ethnic group interest in the resource.

The socioeconomic impact evaluation focused on the social/economic costs of the project work force, the opportunity costs of converting land, and the economic benefit from the project. Factors in the evaluation included commute distance, tax base, and land utilization.

The engineering cost analysis considered the differential costs of constructing lineal facilities to the Candidate Sites. The lineal facilities were new power transmission lines, water supply pipelines, railroads, and access roads. In addition, operating and maintenance costs for the water supply and railroad were also considered. The most important factor in the total differential cost was related to the cost of transportation of coal by rail. This made the total differential cost evaluation dependent on the two coal transportation scenarios (whether the coal was shipped from the north or from the south).

The individual values of environmental impacts and engineering costs for each of the 25 Candidate Sites were combined and used to develop a ranking of sites. The purpose of ranking the sites was to separate the sites into three groups:

- o Highly suitable sites
- o Moderately suitable sites
- o Unsuitable sites

Highly suitable sites included those that were considered most appropriate for detailed studies. These sites generally had the lowest impacts and costs and were considered licensable under federal and state regulations. Moderately suitable sites were considered not as good as the highly suitable sites but could be licensable or potentially licensable with specific mitigative measures. Unsuitable sites could result in significant impacts, excessive project costs, or delays in the project.

2.2.2.1.3 Candidate Site Recommendations

Based on a review of data prepared for the Site Recommendation Report, the Development Manager recommended six Candidate Sites for detailed evaluation. These sites, shown on Figure 2-18, are located in Newark Valley (S1), Butte Valley (S5), Jakes Valley (S7), North Steptoe Valley (S12), Central Steptoe Valley (S16), and Spring Valley (S22). In May 1981, the White Pine County Power Plant Advisory Committee endorsed, by resolution, the six Candidate Sites but requested that additional sites in White River Valley (S9) and South Steptoe Valley (S17) also be included in the detailed evaluation. The Board of County Commissioners acted (under authority granted by the WPPP Development Work Agreement) to approve the eight sites in June 1981. All eight sites were subsequently endorsed by the WPPP Management Committee.

2.2.2.2 Site Selection

2.2.2.2.1 Recommended Candidate Site Evaluation

The primary focus of site evaluation and comparison in the Site Recommendation Report was the degree of impact that the project would have on the environment. In the Site Selection Report, however, the impact of the environment on the project was considered. This concern is generally labeled as the "licensability" of the site. Licensability considers how potential environmental problems at a specific site increase the complexity of the licensing process, thereby creating delays in the overall project schedule. A site that requires fewer permits without significant potential for delays is considered superior to a site where permit problems exist.

In order to evaluate licensability, a series of six evaluation criteria were established as follows:

- Air quality impacts
- Water resource impacts
- Ecosystem impacts
- Cultural resource impacts
- Socioeconomic impacts
- Visual resource impacts

The air quality impact evaluation emphasized the impact on the Steptoe Valley nonattainment area as the most critical factor affecting licensability. The required levels of SO_2 removal were calculated for each site. In addition, two air quality scenarios (which depended on whether or not

SO_2 emission offsets were available in Steptoe Valley) were evaluated.

The water resource impact evaluation considered the effects on the hydrologic environment from withdrawals of groundwater. Computer calculations and modeling to determine water table drawdowns were conducted.

The ecosystem impact evaluation used information from the water resource impact evaluation to determine licensability. The evaluation considered the effects on threatened and endangered species, other important species, and unique ecosystems.

The cultural resource impact evaluation included a reconnaissance level archaeological field study. The sampling included investigations of prehistoric and historic cultural resources.

The socioeconomic impact evaluation focused on the social/economic cost effects of commuting distance to the WPPP site and land utilization. The latter factor emphasized the opportunity costs of converting public domain lands (currently used for livestock grazing) to WPPP-related uses.

The visual resource impact evaluation considered viewing distance from major travel routes, viewing time, scenic quality of the area, background, and the presence of topographic and/or vegetative screening. These criteria were used to group the sites depending on the preference for development.

In addition to the evaluation of environmental impacts, generalized estimates of engineering (i.e., construction and operation) costs were prepared. These costs included both capital costs and operating and maintenance costs for the following:

- Power generation system
- Power transmission system
- Water supply system
- Coal transportation system
- Site access

The engineering cost analysis considered the differential costs of constructing and operating lineal facilities to the sites and the differential costs of constructing and operating air quality control equipment. The most important factors in the total differential cost were related to the cost of transportation of coal by rail and the cost of the air quality control equipment.

An assessment of the fault rupture hazard at the sites was also undertaken to provide input to the study. Photogeologic and field investigations were conducted as a part of the assessment.

Using the environmental impact, engineering cost, and fault hazard evaluations, the eight recommended Candidate Sites were compared and a ranking (order of selection) developed. Because of the differences in the air quality evaluation procedure and the requirement to evaluate sites for two different scenarios, two summary rankings of sites were prepared.

2.2.2.2.2 Recommendations

Based on the information developed for the Site Selection Report, the Development Manager recommended that three of the eight Candidate Sites be selected for baseline environmental studies leading to preparation of an EIS and other permit applications. The recommended sites are located in Butte Valley (S5), North Steptoe Valley (S12), and Spring Valley (S22). The sites in Butte Valley and Spring Valley had the highest potential for licensability considering existing air quality scenarios. The site in North Steptoe Valley, which was not considered licensable, was recommended because of potential economic savings to the project and the net air quality improvement that would occur in the County if certain regulatory problems could be resolved. (These problems were resolved by the redesignation of the northern part of the Steptoe Valley nonattainment area as discussed in Section 3.1.2.2.2.) The recommendation by the Development Manager was approved by the WPPP Management Committee in October 1981.

2.2.2.3 Preferred and Alternative Sites

The sites investigated in the Site Selection Report were reduced in size from a ten-square-mile circular area to a square three miles on a side (nine square miles total area). Preliminary geotechnical studies were conducted to optimize the layout of WPPP facilities and reduce the size of the sites. The studies focused on major geologic hazards (e.g., faulting, flooding, liquefaction, and subsidence) and subsurface soil properties in relation to design of foundations and waste disposal areas. Based on the Preliminary Geotechnical Studies technical report, each of the three alternative sites was reduced to approximately 2500 acres. The three sites, and their legal descriptions, are shown on Figure 2-19.

In order to designate the preferred and alternative sites, significant environmental factors associated with each of the three alternative sites were compared. (All of the identified impacts could be mitigated and did not preclude licensing any site.) In addition, the incremental costs of constructing and operating a power plant at each of the three sites were calculated.

Impacts associated with earth resources primarily affect the economics of the site and were included in the economic studies. The comparison of sites was not sensitive to air resource impacts because all sites were considered essentially equal. There may be minor variations in emission control for site specific reasons but these would not affect the economics of the site. The Spring Valley Site could be affected if the Wheeler Peak Scenic Area were again proposed as a national park.

The Butte Valley Site has inadequate water sources within the valley and will require importation of supplemental groundwater from wells in Steptoe Valley. Therefore, its water resource impacts (as well as ecological resource impacts) would be similar to the North Steptoe Valley Site impacts. Both the North Steptoe Valley Site and the Spring Valley Site are near wetland areas that could be affected by groundwater pumping. The Spring Valley Site is also near an area with a federally listed endangered species. In addition, the high water table at the North Steptoe Valley Site and Spring Valley Site could affect the design of the waste disposal facilities on these sites.

With respect to cultural resources, each site has specific resource potential. Resource sites at the North Steptoe Valley Site and Spring Valley Site could be eligible for the National Register of Historic Places (NRHP) but these sites are either small or can be avoided. Visibility would be high at both the North Steptoe Valley Site and Spring Valley Site, with the latter site in the vicinity of Wheeler Peak.

Although the Butte Valley Site would have the least visibility impact, it is located in the least developed area.

The Impact Alleviation Plan will mitigate most of the impacts associated with socioeconomics. Transportation problems could result because of highway constraints in McGill, which is between Ely and the North Steptoe Valley Site, but these constraints can be mitigated. Although the North Steptoe Valley Site has the longest commute distance, there are no summits or passes subject to snow closure as there are with the other two sites. There would also be some loss of grazing land through development on any of the sites.

The incremental costs of constructing and operating a power plant at each of the three sites were calculated. Because the air quality control systems would be essentially the same at the three sites, there would be little variation in costs associated with the power generation system, and these costs were set at base. The only significant difference would be in the costs associated with the lineal facilities. There could be other site-specific costs associated with development at each of the sites. However, these costs would not change the relative order.

Overall, construction and operation at the North Steptoe Valley Site would be the least costly of the three sites. This is because this site is nearest to the potential sources of coal and would have the shortest rail haul. Railroad savings are reduced by the increased costs associated with the power transmission system. Power from the North Steptoe Valley Site would have to be transmitted the longest distance to load centers of any of the three sites and would require the most equipment for series compensation.

Overall, construction and operation at the Spring Valley Site would be the most costly of the three sites. The Spring Valley Site has the longest rail haul of the three sites resulting in significantly higher construction and operation costs. The overall cost, however, is reduced because of the shorter power transmission lines and reduced series compensation. There could be additional costs for a power plant at the Spring Valley Site due to adverse soil and foundation conditions. Preliminary geotechnical studies indicate that faults located in Spring Valley have the highest potential of the three sites for surface rupture from a large earthquake.

The Butte Valley Site was originally the most expensive site because of the high levels of emission control that were anticipated for facilities at this site. However, air quality modeling studies showed that required emission control levels did not vary significantly among the three sites.

A review of the data indicated that the North Steptoe Valley Site would have the least environmental impact (the highest licensability potential) and the lowest economic cost and, therefore, should be designated as the preferred site. The Butte Valley Site and Spring Valley Site were also licensable and should be designated as feasible alternatives to the preferred site. Either site would be acceptable, although the Butte Valley Site would be less costly to develop.

Based on the above conclusions, the Development Manager recommended the designation of the North Steptoe Valley Site as the preferred site and that the Butte Valley Site and Spring Valley Site be designated as alternatives to the preferred site. This recommendation was approved by the WPPP Management Committee in June 1983.

2.2.3 Power Transmission System Alternatives

Transmission studies were conducted concurrently with site selection studies. The results of these studies are summarized in the Site Selection Report and in the Transmission Selection Report.

2.2.3.1 Preliminary Studies

The WPPP Transmission System Planning Committee originally considered 12 power transmission system alternatives. In general, northern Nevada participants would be served by either a new 230 kv ac or a new 345 kv ac transmission line from the WPPP Generating Station to Gonder Substation, located approximately eight miles northeast of Ely. The southern Nevada participants would be served by either a new 345 kv ac or a new 500 kv ac transmission line to the proposed HAGS to be located approximately 25 miles northeast of Las Vegas. The California participants would be served in any of the following three schemes.

The first scheme includes a new 230 kv ac, 345 kv ac, or 500 kv ac tie to IPP to be constructed near Delta, Utah, with the tie consisting of one or two transmission lines. (IPP includes a new 230 kv ac transmission line to Gonder Substation which could be upgraded to 345 kv ac for WPPP.) Power from IPP would be transmitted over its ±500 kv direct current (dc) transmission lines to a new ac-dc converter station in southern California.

A second scheme includes a new 500 kv ac transmission line to HAGS with a continuation on to the McCullough Switching Station in southern Nevada. From this station, the power would be transmitted over existing lines. Power from the Hoover Dam and coal plants in the Southwest currently is transmitted to southern California over transmission lines emanating from McCullough Switching Station. An alternative scheme consists of a ±500 kv dc transmission line with a tap on one of the IPP ±500 kv dc lines.

A third scheme includes a new ±500 kv dc transmission line westerly to California and then southerly to the LADWP Valley Generating Station in the Los Angeles area.

Two of the 12 alternatives were eventually eliminated and the remaining alternatives were rated based on their relative technical performance. The evaluation included load flow and stability studies and costs of the alternatives.

It should be noted that the three schemes described above were developed to show electrical paths to the load centers of the California participants. Alternative routes were identified in order to determine lengths of transmission lines for electrical studies and for estimates in the WPPP Site Recommendation Report. No corridors were defined or evaluated in detail.

2.2.3.2 System Studies

When the power transmission system studies began, numerous sites were being evaluated within an approximate 50-mile radius of Ely, Nevada. Because of the large number of site and route permutations, it was impossible to investigate all transmission system alternatives. Therefore, a potentially viable site was selected to begin the system analysis. The White River Valley site was initially selected and power flow studies were made. Based on power flow analysis and cost evaluations, the number of transmission alternatives were narrowed to those alternatives that were rated as preferred and acceptable/good alternatives. Stability studies were then made on the remaining alternatives. Based on selection criteria, a 500 kv ac transmission system was then selected.

2.2.3.3 Preferred System

In order to proceed with environmental and licensing activities, a preferred transmission system had to be selected. In November 1981, the WPPP Management Committee was informed of the Transmission System Planning Committee endorsement of a preferred system. This system consisted of a new 345 kv ac transmission line to Gonder Substation and two new 500 kv ac transmission lines to HAGS with a continuation of one line to McCullough Switching Station. In addition, the proposed transmission line between IPP and Gonder Substation could be upgraded from 230 kv ac to 345 kv ac. This preferred system was subsequently modified to include two 500 kv ac lines between HAGS and McCullough Switching Station and to exclude the upgrade of the IPP line.

In January 1983, NPC announced the deferral of HAGS to the mid-1990s. This decision required a reconsideration of the WPPP power transmission system and the possible need for an intermediate switching station with some series compensation. In addition some of the northern Nevada participants were reconsidering their points of delivery.

The results of the new evaluation were presented at the March 1983 WPPP Management Committee meeting. The revised preferred transmission system, as shown on Figure 2-6, was approved at that meeting. This system was used as a basis for selecting transmission line corridors.

2.2.3.4 <u>Preferred and Alternative Corridors</u>

In order to provide flexibility in locating the routes for the power transmission lines, two-mile-wide study corridors were used during initial planning. It should be noted that study corridors are used for preliminary planning purposes and are not the same as designated utility corridors that are established by the BLM.

The selection of transmission line corridors for the preferred transmission system was based on the following procedure:

- Identifying all possible corridors on U.S. Geological Survey (USGS) maps.

- Inspecting the potential corridors in the field.

- Meeting with government agencies to determine

  specific constraints or possible restrictions for unique corridors.

- Evaluating the environmental impacts of the potential corridors, including impacts on land use, physiography, geology, hydrology, ecology, demography, and archaeology.

- Using, where possible, existing corridors.

Two-mile-wide study corridors were selected after a study of reasonable alternatives linking the WPPP sites with delivery points. Reasonable alternatives are defined as those that:

- Traverse a minimal distance and turn a minimum number of major angle points through areas with the lowest elevations possible.

- Avoid populated areas, if possible.

- Minimize impact to private lands.

- Are accessible to conventional construction and maintenance equipment.

- Minimize new access road construction.

- Use existing utility corridors and traveled ways.

- Minimize environmental disturbance.

- Avoid designated WSAs.

- Allow construction of two parallel circuits with minimum separation.

The alternative corridors were plotted on topographic maps and checked against Wilderness Inventory maps and Master Title Plats. The corridors were checked in the field to identify physical constraints, utility corridors, and traveled ways that were not apparent on the existing maps. Meetings were held with the staffs of the Ely District and Las Vegas District of the BLM to identify land use and management plans and other constraints.

In southern Nevada, WSA boundaries affect the transmission line corridor near the Pahranagat Wildlife Refuge and preclude two transmission lines being routed in this area. For this reason, the longer corridor segment east of the

Delamar Mountains WSA was selected. Should the WSA boundaries near the refuge be modified, the preferred corridor segment would be to the west of the Delamar Mountains WSA and parallel to existing and planned transmission lines.

The transmission line route will be located within the two-mile-wide study corridors. The specific center-line alignment for the transmission line right-of-way will be determined during detailed design. Power transmission line right-of-way requirements vary with the voltage and number of circuits in a given right-of-way. Typical right-of-way requirements are shown on Figure 2-20.

The major portion of the transmission line route will be on BLM land. Formal applications including maps and other information necessary to acquire grants of rights-of-way will be filed with the BLM offices having jurisdiction over the required land. Private lands will be purchased from the individual owners at fair market value. Where the transmission lines cross lands under jurisdiction of other federal, state, or local agencies, the appropriate applications and supporting data will be filed with the agency involved.

Both the preferred corridor and alternative corridor segments for the preferred North Steptoe Valley Site are shown on Figure 2-7. The preferred corridor and alternative corridor segments for the alternative Butte Valley Site and the alternative Spring Valley Site are shown on Figure 2-21 and Figure 2-22, respectively.

2.2.4 Water Supply System Alternatives

2.2.4.1 Groundwater Applications

Applications to appropriate groundwater from seven hydrographic basins in the County for industrial use (power generation) were submitted to the Nevada State Engineer. In June 1978, applications for 51,983 afy of water from Steptoe Valley were submitted. In September 1979, the State Engineer declared Steptoe Valley to be a designated hydrographic basin and, subsequently in August 1980, established irrigation of additional lands as a "non-preferred use" in a part of the basin in and around Ely (Groundwater Curtailment Area). Additional applications for 26,063 afy were submitted in November 1979 for Butte Valley, Jakes Valley, Long Valley, Newark Valley, and White River Valley. Applications for 26,063 afy in Spring Valley were submitted in March 1981.

2.2.4.2 Groundwater Investigations

A three-phase groundwater investigation was conducted in the County. The results of the studies were documented in three separate reports.

The Phase 1 groundwater investigations were reconnaissance level and relied on data and information developed by others. Based on an analysis of the data and information, a ranking was made of the seven major valleys in the County as a water supply source for WPPP. The ranking, from most likely water source to least likely water source, was as follows: Spring Valley; Steptoe Valley; White River Valley; Jakes Valley; Butte Valley (southern part); Newark Valley; and Long Valley.

The Phase 2 groundwater investigations verified and refined Phase 1 findings through geophysical investigations and field testing of existing wells. These verified findings were then used to develop specific water supply plans for each of the eight sites evaluated in the Site Selection Report.

The water supply system described in the Site Recommendation Report included wells located approximately on one mile centers and capable of producing up to approximately two cubic feet per second (cfs). These wells were generally located near the centers of the groundwater basins (playas). The Phase 2 investigations indicated that the well fields should be located away from the playas in order to take advantage of better aquifer characteristics.

In the Site Selection Report, the wells were located nearer the valley edges in alluvial fan deposits. These deposits tend to be composed of poorly sorted sands and gravels that readily transmit water and, consequently, produce more efficient wells than those located in finer materials of the playas. Water quality is generally better near the valley edges than in the playas.

The Phase 3 groundwater investigations included exploratory well drilling and test pump operations in Steptoe Valley and Spring Valley. The drilling and pump testing occurred during the summer of 1982. In addition, geophysical resistivity surveys were conducted in the vicinity of potential well field locations in Steptoe Valley and Spring Valley. The results of these surveys provided information on subsurface geophysical characteristics. The Phase 3 studies also included computer modeling to assess the magnitude and extent of possible groundwater level changes due to WPPP pumpage. Information from the groundwater investigations was used to assist in obtaining the WPPP water permits and for evaluating potential environmental impacts.

2.2.4.3 Water Permits

Based on the results of siting studies and groundwater investigations, the pending applications for groundwater from Jakes Valley, Long Valley, Newark Valley and White River Valley were withdrawn in July 1983. In August 1983 a public hearing was held in Ely, Nevada, to discuss the preferred use designation for Steptoe Valley and the pending WPPP applications in Steptoe Valley. At the conclusion of the hearing, the Nevada State Engineer ruled that industrial use (power generation) would be the preferred use for the Steptoe Valley Groundwater Basin, excluding the Groundwater Curtailment Area. In addition, the State Engineer granted water permits for 25,000 afy from Steptoe Valley.

2.2.4.4 Preferred Well Fields and Pipeline Corridors

Because the well fields (and therefore interconnecting pipelines) are tied to the water permits, there are no alternatives to those shown on Figure 2-11 for the preferred North Steptoe Valley Site. Well fields and pipeline corridors for the alternative Butte Valley Site and the alternative Spring Valley Site are shown on Figure 2-23 and Figure 2-24, respectively.

2.2.5 Coal Transportation System Alternatives

Coal supply and transportation studies were conducted in 1981 to identify, screen, characterize, and evaluate potential coal sources and modes of transportation for a project located on any of the sites identified in the Site Recommendation Report.

2.2.5.1 Coal Sources

Coal reserves exist throughout the continental United States. The quality of coal contained in these coals range from the high sulfur and high heating value coals of the Appalachian Region to the low sulfur and low heating value coals and lignites of Wyoming, Montana, and North Dakota. A list of the most economically viable coals for WPPP was developed through a four-step screening process. This process included an increased level of detail at each successive step.

In Step 1, coals from east of the Mississippi River and from the Interior Province (Kansas, Oklahoma, Missouri, Arkansas, and Iowa) were evaluated but were eliminated because of high mining and transportation costs. Gulf Coast lignite was eliminated because of its low heating value and high transportation cost.

In Step 2, approximately 80 coal deposits represented as regions, basins, or fields were identified in the Pacific Coast Province (Washington, Oregon, California); Rocky Mountain Province (Nevada, Arizona, New Mexico, western Colorado, Utah, Idaho, western Montana, western Wyoming); and Northern Great Plains Province (eastern Montana, eastern Wyoming, North Dakota, South Dakota). Of these, all but nine were eliminated because of insufficient reserves, uneconomical transportation, prohibitive mining costs, and/or environmental sensitivity. The nine coal deposits which resulted from the Step 2 screening process are as follows:

- Black Mesa Region (Arizona)
- Green River Region (Colorado and Wyoming)
- Hanna Field (Wyoming)
- Hams Fork Region (Wyoming)
- Henry Mountains Field (Utah)
- North Park Region (Colorado)
- Powder River Basin (Wyoming and Montana)
- Southwestern Utah Fields (Alton and Kaiparowits)
- Uinta Region (Utah and Colorado)

Step 3 involved preparation of detailed descriptions of each of the nine coal-bearing regions. These descriptions included: 1) location by state and county; 2) geology; 3) mineable reserves (both underground and surface); 4) coal quality and production (past, present, and future); 5) mines (active, inactive, and proposed mines); and 6) market prices. Based on these parameters, approximately 80 active or proposed mines were identified as potential sources of coal.

The final step (Step 4) of the screening process included the development of estimated generation costs for each of the approximately 80 coal mines identified and described in Step 3. The development of generation busbar costs considered the following parameters, as appropriate: 1) coal prices (FOB mine); 2) railroad tariffs; 3) new railroad construction; 4) rehabilitation of existing railroad; 5) coal car capital and operating costs; 6) slurry pipeline capital and operating costs; 7) plant capital costs; and 8) plant operation and maintenance costs. The following computations were developed for each coal: 1) distance to Ely, Nevada; 2) unit train cycle time; 3) slurry pipeline length; 4) number of slurry pipeline pumping stations; 5) fuel burn rate; 6) steam generator efficiency; 7) auxiliary power requirements; 8) scrubber additive requirements; and 9) solid waste quantities. The results of a computer-assisted evaluation indicated that the following mix of potential coal fuel supply systems should be considered for WPPP:

- o Uinta Utah Region (rail or slurry)
- o Uinta Colorado Region (rail only)
- o Alton Field (rail or slurry)
- o Hams Fork Region (rail only)
- o Green River Region in Wyoming (rail only)
- o Powder River Basin in Wyoming (slurry only)

Coals from the other coal supply areas identified in Step 3 were eliminated for the following reasons:

- Black Mesa Region - Poor transportation and legal/ environmental concerns.

- North Park Region - High transportation costs and marginal reserve position.

- Kaiparowits Field - Poor access, environmental concerns, and no existing production.

- Henry Mountains Field - Poor access, environmental concerns, and no existing production.

- Hanna Field - Poor economics.

- Green River Region (Colorado) - Poor economics.

- Powder River Basin (Montana) - Poor economics.

Based on the results of Step 4, 58 coal mines or reserves were identified as potential sources of coal for WPPP. Of these 58 sources, 19 located in the Powder River Basin of Wyoming are potential coal sources only if delivered by slurry pipeline. The low heating value of the Powder River Basin coal in conjunction with the distance from the Gillette, Wyoming area to the County make railroad transportation of this coal too expensive. The feasible coal sources are shown on Figure 2-15.

2.2.5.2 Coal Transportation

The existing mainline railroad systems serving the coal regions in Wyoming, Utah, Nevada, and Colorado are adequate to haul coal from each of the identified coal sources with the exception of coal from the Alton Field. The existing railroad systems, as shown on Figure 2-15, include trackage owned by the Denver and Rio Grande Western, Union Pacific (UP), Southern Pacific (SP), and Utah Railway. Although some operating constraints exist within these rail systems, the overall physical and operating characteristics of these systems require little improvement.

With few exceptions, all of the identified coal sources would be served by the existing railroad systems or would require that a short spur be built as a part of mine construction. The exceptions would involve substantial new construction to provide rail access to the Alton and Emery areas of Utah.

Possible slurry pipeline routes originating in the Alton area, Utah Uinta Region, and Powder River Basin were evaluated. The pipeline routes were selected to avoid state and national parks, Indian reservations, population centers, and severe topography, where possible. The maximum pipeline slope of the grade along the routes was set at 16 percent which is an operational requirement to limit solids build-up that would occur in elevation sags during pipeline shutdowns.

The pipeline routes follow existing road, railroad, and transmission line rights-of-way where possible. The pipeline routes are located near existing transmission corridors to minimize the costs of the transmission lines required to provide the power requirements of the pumping stations located along the pipelines. The number of pumping stations was determined based upon using positive displacement pumps which could develop hydraulic heads in the range of 1100 feet to 1900 feet to meet the requirements of raising the coal slurry over successive mountain ranges.

In general, the design characteristics of the pipeline subsystems were based on those of the Black Mesa pipeline, which is associated with the Mohave Generating Station located in southern Nevada. The possibilities of using water at the mine (the no-recycle option) and of using recycled slurry water combined with plant water (the water recycle option) as sources of water for the coal/water slurry were also investigated.

2.2.5.3 Preferred System

The coal supply and transportation studies were documented in the Coal Source and Transportation Study. Based on this study, the Development Manager determined that coal delivery by rail would be more economically attractive than by slurry pipeline. In addition, it was determined that the capability of using coals from the Uinta Region, Green River Region, and Hams Fork Region would enhance the WPPP negotiating position with coal suppliers and that these sources should also be used in developing the design basis coal. Subsequent to these determinations, it was also found that coal from Alton Fields would not be available in sufficient quantities to justify the construction of a new railroad. With the elimination of this source, delivery by rail from the north would be the preferred transportation option.

2.2.5.4 Electrified Railroad System

As currently proposed, the preferred coal transportation system includes unit train operation from various coal sources to the WPPP site. Because of potential advantages from an electrified railroad, the feasibility of using all electric locomotives (and associated wayside distribution system) along the NNRy right-of-way was investigated and compared against a similar operation using diesel locomotives.

The most feasible alternative would be for WPPP to own and operate all electric locomotives and ancillary equipment between the SP and UP interchange points at Cobre and Shafter and the WPPP site. The locomotives would be energized with power from the WPPP Generating Station. Sites to exchange empty unit trains for loaded trains with the delivering carriers would be located at either Cobre or Shafter. Based on a life-of-plant economic analysis, electrified railroad operation can be considered economically equivalent to diesel operation.

A typical cross-section of the electrified railroad is shown on Figure 2-25. The most visible aspect of the electrified railroad would be the 28-foot-high wood stanchions which would be located every 250 feet along the right-of-way.

2.2.5.5 Preferred and Alternative Corridors

Study corridors were selected after a study of reasonable alternatives linking the WPPP sites to northern or southern "gateways". These study corridors are approximately two miles wide except where constrained by narrow passes or WSA boundaries. The specific centerline alignment for the railroad right-of-way will be determined during detailed design.

The preferred corridor and alternative corridors for the preferred North Steptoe Valley Site are shown on Figure 2-17. Corridor lengths are included in Section 2.1.4.1.

The preferred corridor and alternative corridors for the alternative Butte Valley Site are shown on Figure 2-26.

The preferred northern route from Cobre to the Butte Valley Site would require 117 miles of railroad construction.

Construction along the westerly alternate segment would add an additional nine miles. The alternate southern route would require 165 miles of railroad construction from Pioche to the Butte Valley Site.

The preferred corridor and alternate corridors for the alternate Spring Valley Site are shown on Figure 2-27. The preferred northern route from Cobre to the Spring Valley Site would require 157 miles of railroad construction. Construction along the westerly alternate segment would add an additional four miles. The alternative southern routes would require 75 miles of railroad construction along either corridor from Pioche to the Spring Valley Site.

2.2.6 Other Alternatives

2.2.6.1 Road Access

Road access will be provided from adjacent highways or, in the case of the Butte Valley Site, the nearest major highway. The site will have a main access driveway which will ultimately lead employees and visitors to the main security gate and parking areas. Additional driveway entrances may be necessary for material delivery and employee access during construction.

Roads on the site will be paved where necessary for routine operational access. Unpaved roads will be surfaced with crushed rock and will provide access to areas which are visited or patrolled on an infrequent basis (once daily or less).

The Butte Valley Site will require construction of an access road of approximately 14.5 miles from U.S. Highway 50 to the site as shown on Figure 2-23. The road will generally follow and, for a majority of its alignment, be an upgrading of the existing, unpaved Thirty Mile Road. The road will be paved to provide two lanes of traffic and shoulders. Design will be consistent with state and County highway standards and will permit safe driving speeds up to 50 miles per hour.

Development at the North Steptoe Valley Site may require that U.S. Highway 93 be upgraded or rerouted in the McGill area. Currently, this highway is routed through the central business district and access corridor in McGill. The increased traffic volumes, which would be generated during construction and operation, may overtax the carrying capacity of the highway at this location and create undesirable impacts on safety and increased commuting time.

A study to explore possible alternatives to alleviate this problem resulted in three alternatives. The street widening alternative would require widening 7000 lineal feet of existing two-lane streets to four lanes. The tailings bypass alternative would require constructing a new three-mile long, two-lane highway that would branch off U.S. Highway 93 south of McGill and rejoin the highway north of McGill after traversing the Kennecott tailings area approximately 200 feet to 600 feet west of the community. The west end bypass alternative is similar to the tailings bypass alternative except that the new highway would be constructed between the tailings area and the community.

At the Spring Valley Site, it will be necessary to relocate a paved, two-lane County road. This road traverses the site in an east-west direction and provides access from U.S. Highway 93 to the east side of the valley. The road may be routed easterly along the north site boundary and then southeasterly to join the current alignment. Approximately four miles of relocated road would be required.

2.2.6.2 Construction Material

Earth materials for construction of dikes, for cover for the synthetic liners in the bottom ash basins and evaporation ponds, and for soil cover of the solid waste landfill area will be developed from borrow sites on the site. These materials will be predominantly silty sands.

Approximately 670,000 cubic yards of rock materials, such as aggregate, sand, gravel, and riprap, will be needed for concrete and asphalt mixes, road base, lining of dikes, and rock-surfaced areas during the construction period. Potential borrow areas for sand, gravel, and aggregate materials have been identified in the vicinity of each of the three WPPP sites. The borrow areas for the preferred North Steptoe Valley Site are shown on Figure 2-3. Borrow areas for the alternative Butte Valley Site and Spring Valley Site are shown on Figure 2-28 and Figure 2-29, respectively.

Additional rock materials will be required for construction of the power transmission system, the water supply system, and the coal transportation system. Concrete and some rock products for the portions of these systems within economical haul distances will most likely be developed from the same source areas as for the power generation system. However, the portions located beyond an economical haul distance will require development at other sources.

CHAPTER 3

3.0 AFFECTED ENVIRONMENT

The purpose of this chapter is to present existing (baseline) conditions of the environmental resources which will be affected by WPPP. The level of detail of the technical discussions are commensurate with the magnitude and intensity of the potential impacts for each resource. Baseline data have been summarized from the following technical reports prepared in support of the EIS:

- Air Resources Baseline
- Water Resources Baseline
- Ecological Resources Baseline
- Cultural Resources Baseline
- Visual Resources Baseline
- Socioeconomics Baseline

Information on earth resources is based on geotechnical investigations included in the technical report on Preliminary Geotechnical Studies and other sources. In addition, information on threatened and endangered species and candidate species is included in the Biological Assessment.

The description of the affected environment is presented in a regional context (Section 3.1) and in a site-specific context (Section 3.2) for each of the three WPPP sites. When referring to earth resources, air resources, water resources, and socioeconomics, the regional area is the County. When referring to ecological resources, cultural resources, and visual resources, the regional area includes the County and other parts of Nevada traversed by the corridors for the lineal facilities (the WPPP region).

3.1 REGIONAL SETTING

3.1.1 Earth Resources

The following sections include baseline data on earth resources of the County. Additional information is included in the references listed in Chapter 7.

3.1.1.1 Physiography

The County is situated within the Basin and Range Physiographic Province, a region characterized by north-south trending mountain ranges separated by deeply alluviated valleys. Relief varies from low to extreme with the mountain ranges rising 2000 to 7000 feet above the adjacent valleys. The mountain ranges are typically elongated with many extending for more than 50 miles. Maximum range elevations vary from about 7000 to 13,063 feet at Wheeler Peak in the Snake Range. Elevations of the valley floors average from 5500 to 6500 feet.

Most of the valleys within the County are characterized by internal drainages (i.e., streams flow toward the lowest point in the valley with no outlet). The White River Valley, part of the Colorado River drainage basin, is the only valley in the County with external drainage. The closed basins are generally floored by nearly flat-bottomed playas that may be flooded by runoff from the mountains during times of high precipitation.

3.1.1.2 Geology

The mountain ranges within the County are composed of a diverse sequence of late Precambrian to mid-Tertiary igneous, metamorphic, and sedimentary rocks representing about 500 million years of earth history. A geologic time scale is shown on Figure 3-1. The Precambrian and Paleozoic rocks consist primarily of quartzite, limestone, and dolomite with lesser amounts of sandstone, siltstone, and shale. Mesozoic rocks are generally scarce in the County but include a heterogeneous sequence of nonmarine Cretaceous strata which crop out only in the westernmost portion of the County. Tertiary rocks exposed in the mountain blocks consist of interbedded volcanic, volcaniclastic, and sedimentary rocks ranging in age from Eocene to Pliocene. Quaternary deposits blanket the valley areas and consist mainly of semi-consolidated to unconsolidated alluvial fan, lacustrine, and minor aeolian deposits.

The structural setting of the Basin and Range Province is dominated by a complex system of faulting as shown on Figure 3-2. Movement along these faults has resulted in the relative uplift of linear mountain ranges, and the relative subsidence of adjacent segments to form the valleys. This type of structural deformation began about 17 million years ago and is thought to be related to deep-seated extension in the upper mantle. The present topographic configuration of basins and ranges was established by about 11 to 13 million years ago but did not reach its present degree of development until about 7.5 million years ago. Most of the present ranges are bounded on one side by a major, large displacement fault and on the other by numerous short, small displacement faults with the mountain block being tilted toward the latter side of the range. Many of these range-bounding faults have been active in the late Quaternary (last 500,000 years), and a few have moved during historic time, indicating that this style of deformation is continuing to the present.

Sediments eroded from the carbonate and volcanic rocks comprise the bulk of the valley fill materials. These unconsolidated materials include gravel, sand, silt, and clay deposited under subaerial or lacustrine conditions. Most of the valleys are underlain by deposits of older, very coarse gravel and boulders deposited by streams on the alluvial fans and narrow pediments along the mountain fronts. The alluvial fan deposits grade from coarse sand and gravel, near the heads of the fans (adjacent to the range fronts), to fine sand and silt toward the distal portions of the fans (closest to the valley floor). Silt and clay predominate in the playas in the lowest part of the internally drained valleys.

3.1.1.3 Seismicity

The Basin and Range Province has experienced several earthquakes of Richter Magnitude (Magnitude) 7 or greater since 1840. Each of these earthquakes occurred within a north-south trending zone extending from Owens Valley in east-central California northward through west-central Nevada. The largest of these events are the 1872 Lone Pine (Magnitude 8) and 1915 Pleasant Valley (Magnitude 7.6) earthquakes. These earthquakes have been accompanied by zones of surface rupture up to 50 miles long and 3 to 6 miles wide with scarps as high as 20 feet. In the County, however, earthquakes larger than Magnitude 5 are not known to have occurred. Table 3-1 lists major historic earthquakes that have occurred in the Great Basin region and vicinity. None of these earthquakes are associated with faults in White Pine County.

Active and potentially active faults in the Basin and Range Province appear to be evenly distributed throughout the region and are not confined to a particular area such as the zone of historic earthquakes described above. Therefore, the locational distribution of large historic earthquakes is misleading if used for determining seismic risk. In the long term, large magnitude earthquakes could occur anywhere throughout the Basin and Range Province. In the near term (within the operating life of WPPP), earthquakes could occur along the north-south zone of historic seismicity previously discussed or could occur along active faults.

3.1.1.4 Geologic Hazards

3.1.1.4.1 Strong Ground Motion

Each of the three WPPP sites is located close to major block-bounding faults in the Great Basin as shown on Figure 3-2. This type of fault is capable of generating earthquakes greater than Magnitude 7. However, recurrence intervals for large (Magnitude $\geq$ 6) earthquakes on faults in the Basin and Range Province are estimated to be a few thousand to several hundred thousand years long. Therefore, the probability of strong ground motion occurring within the operating life of WPPP from a nearby major fault is very low.

3.1.1.4.2 Surface Fault Rupture

As discussed in Section 3.1.1.3, the Basin and Range Province contains numerous active and potentially active faults along which surface faulting may occur. The potential for surface rupture on a particular fault depends on several variables including fault length, slip rate, recurrence interval, and the amount of time elapsed since the most recent earthquake on that fault. The potential for surface rupture depends upon the nature of faults and lineaments present.

The recurrence interval for earthquakes on major block-bounding faults in the Basin and Range Province such as those in the County is on the order of a few thousand to a few hundred thousand years. These recurrence intervals are at least an order of magnitude longer than for major active faults in California. Therefore, although the potential for surface fault rupture exists, the probability that surface fault rupture would occur within the next 50 years is low.

3.1.1.4.3 Liquefaction and Dynamic Settlement

Liquefaction and dynamic settlement are the result of strong earthquake shaking. Loose granular soils are particularly susceptible to liquefaction and dynamic settlement. Liquefaction is known to occur only in saturated or nearly saturated soils while dynamic settlement can occur in both dry and wet soils.

Based on preliminary geotechnical investigations, the potential for liquefaction and dynamic settlement is not expected to be a major geotechnical hazard. Minor exceptions include loose silty sand of mudflow origin and aeolian sand.

3.1.1.4.4 Hydrocompaction

Hydrocompaction (soil collapse) is a phenomenon whereby soils, with a loose particle structure and weakly cemented by water soluble minerals or by clay bonding, collapse under their own weight or under foundation loading upon initial wetting. The potential for hydrocompaction is greatest in soils associated with young alluvial fan deposits which tend to be underconsolidated and, therefore, may be moderately compressible under heavy foundation loads.

3.1.1.4.5 Mud or Debris Flows

Mud or debris flows are present within the young alluvial fan deposits in the County. These areas should be considered susceptible to either mud or debris flows in the future.

3.1.1.4.6 Landslides

Due to the relatively shallow slope gradients present on valley floors, landsliding of unstable slopes should not be a problem.

3.1.1.4.7 Flooding

Flooding of portions of valley floors may occur after periods of intense rainfall in the adjacent mountains. Those portions most susceptible to flooding are the fine-grained, young alluvial fan surfaces and areas containing lacustrine deposits.

3.1.1.5 Mineral Resources

The County has produced more mineral wealth than any other county in Nevada. Mineral commodities produced include 12 metals and 11 nonmetals. Copper has the greatest total value of all minerals found in the County. The Robinson Porphery Copper District in the vicinity of Ely has been one of the major producing districts in the United States. Other important metal ores present in the County include lead, zinc, silver, and gold. The bulk of the mineral wealth in the County is contained in the mountainous areas.

3.1.2 Air Resources

The following sections include baseline data on air resources of the County. Additional information is included in the Air Resources Baseline technical report. The meteorological and air quality monitoring program conducted during 1982 and 1983 is described in Section 3.2.2.

3.1.2.1 Climatology and Meteorology

The County is located near the southern rim of the Great Basin of the western United States. Local climate is influenced by the interior location, regional weather systems, and the north-south topographic orientation which dominates the area. Valleys are typically 50 to 100 miles in length and 10 to 15 miles in width. A summary of the climatological features of the County, based on long-term records for Ely, Nevada, is presented in the following sections.

3.1.2.1.1 Temperature

The average annual temperature in Ely, Nevada is 44°F. The warmest temperatures occur in July when the average daily maximum is 86°F and the average daily minimum is 48°F. The coolest month is January which averages a daily maximum of 38°F and a daily minimum of 9°F. Temperatures below freezing (32°F) occur almost every day in December and January and, on the average, 218 days per year. Temperatures below 0°F or above 90°F each occur about 18 days per year.

3.1.2.1.2 Relative Humidity

The average relative humidity in Ely is 49 percent. The average monthly relative humidity values range from 63 percent, in January and February, to 33 percent in July. Relative humidity is lowest in the mid-afternoon and highest during night and early morning. The highest average values of 73 percent are attained in February during early morning. Lowest average values of 21 percent are attained in July during mid-afternoon.

3.1.2.1.3 <u>Precipitation</u>

Average annual precipitation (all forms) in Ely is 8.7 inches (as water), which falls at a relatively constant rate throughout the year. From 1942 through 1981, annual precipitation has ranged from 4.6 inches to 14.7 inches. The maximum amount of precipitation to fall in a single month was 3.67 inches. Snowfall averages 46 inches per year. The greatest average snowfall months are January and March. The maximum snowfall in a single month was 24.8 inches.

3.1.2.1.4 <u>Cloud Cover and Visibility</u>

Cloudy days in Ely are most frequent in the winter months with these conditions occurring about 15 days per month. Clear and partly cloudy days occur most frequently in the summer months with clear days occurring about 15 days per month and partly cloudy days about 11 days per month.

Visibility is restricted to less than one-half mile on only about six days per year. This condition is most frequent during winter and early spring, most likely as a result of fog. Visibility less than 5 miles occurs about 12 percent of the time, primarily from October through May.

3.1.2.1.5 <u>Wind</u>

The average annual wind speed in Ely is 10.5 miles per hour (mph). Average monthly speeds are fairly constant throughout the year, ranging from 10.1 mph in November and December to 11 mph in April. The prevailing direction is southerly during all months. The relative frequency of southerly winds is approximately 25 percent, with winds from the other directions between south-southeast and southwest occurring an additional 28 percent of the time. This and the secondary maximum of northerly winds are indicative of the north-south orientation of Steptoe Valley.

3.1.2.1.6 Atmospheric Stability and Mixing Heights

Stability is an atmospheric property that reflects atmospheric mixing. In general, greater turbulence and mixing are possible as the atmosphere becomes less stable. The mixing height, measured from the ground upward, is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing.

On an annual basis at Ely, unstable conditions (Pasquill-Turner Stability Class A, Class B, and Class C) occur 20.3 percent of the time; neutral conditions (Class D) occur 46.3 percent of the time; and stable conditions (Class E and Class F) occur 33.4 percent of the time. Atmospheric mixing, and hence dispersion, is greatest during unstable daytime conditions and least during stable nighttime conditions.

Unstable conditions are most frequent in summer and are the result of longer days, a high sun angle, and a low frequency of cloudiness. Stable conditions occur at night and are more frequent in fall than in winter because of cloudier winter skies which favor neutral conditions.

Average seasonal morning and afternoon mixing heights in Ely range from 479 feet in fall to 1401 feet in spring and average 686 feet on an annual basis. Average afternoon mixing heights (above ground surface) range from 3346 feet in winter to 11,755 feet in summer and average 7667 feet on an annual basis. Average afternoon mixing heights, which are most important in restricting atmospheric dispersion potential, are sufficiently high so as to have a minimal effect on restricting dispersion of pollutants in the area.

3.1.2.1.7 Severe Weather

Severe weather in Ely is primarily restricted to occasional thunderstorms which are most frequent in July and August, occuring eight days per month on the average. Thunderstorms are least frequent from November through March when they occur less than one-half day per month on the average.

Since 1916, only two tornadoes have been reported in the County. During the same period, approximately 20 tornadoes were reported in Nevada. Data regarding the severity of these tornadoes are not available.

3.1.2.2 Air Quality

3.1.2.2.1 Ambient Air Quality Standards

Establishment of ambient air quality standards is the responsibility of the Environmental Protection Agency (EPA) and the State of Nevada Division of Environmental Protection (DEP). The Clean Air Act provides for the establishment of National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. Air quality is considered acceptable if pollutant levels are continuously less than or equal to NAAQS or, in the case of short-term federal standards (24-hour average or less), exceed the standards no more than once each year. State of Nevada ambient air quality standards are also not to be exceeded.

Federal and state standards require the prevention of significant deterioration (PSD) of air quality in regions that attain NAAQS. These attainment areas are designated as follows:

a. Class I areas where almost no increases are allowed.

b. Class II areas where normal industrial growth is allowed.

c. Class III areas where greater than normal industrial growth is allowed.

The County (except for a part of Steptoe Valley) and surrounding areas are designated Class II areas. There are no Class I areas within 90 miles of any of the three WPPP sites.

Emission standards, based on Best Available Control Technology (BACT), were set to keep pollutant concentrations below NAAQS. Control technology requirements that fulfill BACT are determined case-by-case considering the type of source, precedent BACT determinations, potential energy penalties associated with stringent control measures, and local economic impact factors. BACT must always be at least as stringent as New Source Performance Standards (NSPS) delineated by law, but the latitude allowed in the case-by-case determination provides room for negotiation of specific requirements.

Current regulations require that any new source of air pollution in a nonattainment area (or outside the area, but causing a significant impact on the area) must produce a net air quality benefit in that area. This net air quality benefit is obtained using emission offsets (reductions in air pollutant emissions from existing sources in the nonattainment area) of sufficient magnitude to result in the required net air quality benefit. In addition, the new source would be required to use Lowest Achievable Emission Rate (LAER) control technology. LAER is more stringent than BACT and NSPS and is defined as the lowest emission rate allowed or achieved anywhere without regard to cost or energy use.

3.1.2.2.2 Regional Emissions Inventory

The County is a rural area with limited industrial activity. The only major industrial pollutant source is the McGill smelter. Pollutants emitted from the McGill smelter are primarily SO_2 and particulate matter (PM). Wind-blown dust also contributes to PM emissions in the County.

In recent years, SO_2 emissions from the McGill smelter averaged 20,000 to 30,000 pounds per hour (lb/hr), occasionally exceeding 65,000 lb/hr. As a result of smelter emissions, Steptoe Valley was designated by EPA as a non-attainment area (existing air quality worse than NAAQS) for SO_2.

At the time of the Site Selection Study, the SO_2 nonattainment area designation for Steptoe Valley placed a clear restriction on siting in Steptoe Valley and severely constrained sites adjacent to the valley. Siting in an area where the WPPP Generating Station could significantly impact the air quality of the nonattainment area would also trigger the requirement for LAER SO_2 control technology.

Redesignation of the northern part of Steptoe Valley was required to create a condition whereby WPPP could apply under normal permitting procedures. The plan, as outlined by EPA, was to request redesignation of a part of Steptoe Valley that could be shown, by air quality modeling, not to exceed NAAQS. Reclassification to attainment status would have required monitoring to demonstrate with empirical data that the area is in attainment. However, unclassified status could be reached through theoretical studies. Modeling studies using Kennecott emission data and an EPA-approved air quality model were conducted. The results were submitted to DEP, which in turn requested redesignation from EPA using the modeling studies as the technical demonstration required for reclassification. The final rulemaking was published in the May 14, 1982 issue of the Federal Register (47 FR 20772). Figure 3-3 shows the new limits of the Steptoe Valley non-attainment area in relation to the three WPPP sites. As shown on the figure, an east-west boundary approximately 20 miles south of the North Steptoe Valley Site is the new northern limit of the nonattainment area. The rest of the County is either designated as unclassified (remainder of Steptoe Valley) or attainment (all other areas) for SO_2.

Estimated PM emissions from the McGill smelter average 2230 lb/hr. Steptoe Valley is designated by EPA as unclassified for PM, indicating that existing air quality data are insufficient to determine whether the area is attainment or nonattainment. The remainder of the County is designated as attainment for PM.

3.1.3 Water Resources

The following sections include baseline data on water resources of the County. Additional information is included in the Water Resources Baseline technical report. The groundwater investigations conducted during 1982 and 1983 are described in Section 2.2.4.2.

3.1.3.1 Geology

A description of the bedrock and surficial geology of the County is included in Section 3.1.1.2.

3.1.3.2 Hydrology

The mean annual precipitation in the County ranges from approximately 4 inches on the lower valley floors to more than 16 inches in the higher mountain ranges. A significant portion of the annual precipitation occurs in the form of snow. In areas of high snowfall, snowmelt accounts for most of the surface runoff and groundwater recharge. The mean annual snowfall averages between 10 and 40 inches on the valley floors to more than 80 inches in some of the higher mountain areas. The maximum precipitation events occur more frequently in the spring and summer months than in any other season. The occurrence, amount and intensity, and type of precipitation are related primarily to topographic effects and elevation.

Estimates of surface water or lake evaporation in the valley bottoms range from 42 to 60 inches per year. Transpiration estimates range from a few inches per year for scattered vegetation types to about 18 inches per year for wetland areas. In most areas, water availability is the main factor limiting evapotranspiration.

Surface water occurrence within the County is largely seasonal and, with the exception of small streams which originate in the mountain areas or from springs, streamflow occurs only during or following periods of snowmelt or heavy rainfall. Continuous surface water discharge records are being collected by USGS at three stations within the County. In addition, the discharge on other surface water courses and from springs is being monitored on a irregular basis by USGS, BLM, and others.

Groundwater occurs both within the unconsolidated valley fill and bedrock units. In the valleys, the major component of groundwater recharge comes from precipitation from the bordering mountain ranges through infiltration of surface runoff on the alluvial slopes, and by underflow from the bedrock units which comprise the mountain ranges. In general, the direction of groundwater flow in the shallow flow systems within the valley fill materials is controlled by the surface topography, and by the thickness and physical composition of the unconsolidated materials. Groundwater flow within the deep bedrock system is controlled by the geologic structure, stratigraphy, and by major topographic features. A deep regional groundwater system within the carbonate section has been identified in eastern Nevada. Within both the shallow and deep flow systems, groundwater flow tends to be from areas of higher elevation toward the valleys. The major areas of groundwater discharge are located along the perimeter and within the central portion of the valleys. The primary mechanism for groundwater discharge within the valley floor is evapotranspiration. In some of the valleys, groundwater is discharged as springs and seeps along the edges of the valley and directly to stream channels or other topographically low areas.

Although the majority of the groundwater basins in the County are topographically closed basins, inter-basin groundwater transfer occurs through both the unconsolidated valley fill materials and through the bedrock. The quantity of inter-basin flow is generally small in relation to the total volume of water annually recharged to, and discharged from, the alluvial valley aquifer systems. It may, nevertheless, be a significant part of the total hydrologic budget in some valleys.

Favorable locations for groundwater development occur within the coarser alluvial fan materials located along the edges of the valley floor and away from the finer sediments within the playas, which typically are located near the center of the valleys. Where a playa does not exist in the center of the valley, wells usually can be located lower on the fan in order to intercept more of the groundwater flow. The principal water-bearing beds tapped by most of the wells in the County are in the unconsolidated sands and gravel underlying the alluvial apron and valley floor areas. Few existing water wells have been drilled deeper than several hundred feet. Therefore, most of the useful data on groundwater occurrence and potential yields are limited to the upper interval. Limited data, however, have been developed on the deep carbonate aquifer system in conjunction with the M-X Program. These data are not directly relevant to WPPP.

The perennial yield, which is defined as the largest quantity of water that can be drawn from an aquifer for an indefinite period of time without causing continuing depletion of storage or a deterioration of water quality beyond limits of economic recovery, has been estimated for the County by USGS and the Nevada Department of Conservation and Natural Resources (NDCNR). Based on this information and current water use information, there are no groundwater basins in the County that are being depleted.

3.1.3.3 Groundwater Quality

Groundwater quality in the Basin and Range Province ranges from fresh to brine. Generally, the groundwater is fresh in the alluvial aprons at the margins of most valleys. Saline water occurs locally near some thermal springs and in areas where the aquifer includes rocks containing large amounts of soluble salts. Within the valley aquifers, groundwater quality decreases with residence time from the areas of recharge along the valley perimeter to the main areas of discharge within the central portions of the valleys.

3.1.4 Ecological Resources

The following sections include baseline data on ecological resources of the WPPP region. Additional information is included in the Ecological Resources Baseline technical report and in the Biological Assessment technical report.

3.1.4.1 Soils

The soils of the County are within the Basin and Range Province. Parent materials from which basin soils originate include the weathered limestone, quartzite, granite, and other rocks of the adjacent mountain ranges. Soils of the mountains and foothills have formed primarily from residual sedimentary and igneous rocks.

The soils of the County are predominantly of the northern, or cool desert within the Calcareous Mountains Section of the Great Basin Division of the Intermountain Region in Nevada. These soils, in general, support sagebrush and shadscale communities characteristic of the region.

3.1.4.2 Vegetation

Typical vegetation zones in the WPPP region are shown on Figure 3-4. The WPPP region is primarily located in the Northern Desert Shrub Biome of the Cold Desert Formation. Portions of the power transmission system corridors also traverse Mojave Desert vegetation, which becomes increasingly more prominent in Clark County.

The Northern Desert Shrub Biome is characterized by shadscale and sagebrush vegetation zones. Shadscale-dominated communities are associated with valley floors and saline soils where precipitation is generally less than seven inches, and plants are generally sparse. Besides shadscale, bud sagebrush, Gardner saltbush, low rabbitbrush, spiny hopsage, and winterfat characterize the vegetation. Poorly drained seeps and saline riparian areas support meadow vegetation of inland saltgrass, alkali sacaton, and alkali cordgrass. Cattails and rushes mark wetlands where salinity is lower and drainage is somewhat improved.

Sagebrush is best developed on deep, permeable, low saline soils, usually on valley floor, terrace and piedmont deposits. Big sagebrush characterizes this vegetation. Low sagebrush, black sagebrush, rubber rabbitbrush, and littleleaf horsebrush also occur as prominent associates.

Woodland and forest vegetation occurs from about the 6500-foot elevation on slopes above the valleys. Pinyon-juniper woodland forms the lowermost component of this vegetation, varying in composition with elevation, slope, exposure, and soil conditions.

White fir, with limited amounts of ponderosa pine, forms a montane zone (coniferous forest habitat) beginning at about 8000 feet. Engelmann spruce and Douglas fir occur sporadically, primarily along stream courses and on north exposures. Similarly, aspen occupies seeps and moist colluvium.

Other vegetation is restricted to the upper elevations of the mountain ranges. Bristlecone pine, along with limber pine and, more rarely, whitebark pine, form ridgetop forests above about 8500 feet, and alpine tundra occurs primarily above 11,000 feet.

Great Basin shrub vegetation is gradually replaced by Mojave Desert elements south of the Lincoln/Clark county line and is represented by creosote bush communities, with a creosote bush/wolfberry/spiny hopsage association the most common. Blackbrush, along with scattered groves of Joshua tree, characterize a transitional zone between hot desert and cold desert biomes.

A partial list of plant species found in the WPPP region is included in Table 3-2.

3.1.4.3 Terrestrial Wildlife

The WPPP region consists of several habitat types used by various terrestrial wildlife species. A partial list of terrestrial wildlife species found in the WPPP region is included in Table 3-3.

The valley bottoms primarily provide shrub-steppe habitat composed of the shadscale, sagebrush and greasewood communities. Shrub-steppe is utilized by black-tailed jack rabbit, pronghorn, wild horse, horned lark, sage sparrow, Brewer's sparrow, sage thrasher, sage grouse, western fence lizard, and western rattlesnake.

At higher elevations, fingers of pinyon-juniper woodland habitat extend downward from adjacent ridges into the shrub-steppe habitat. The pinyon-juniper woodlands provide habitat for mule deer, mountain bluebird, ferruginous hawk, and scrub jay. Also occurring in the valley bottoms are wetlands protected by Section 404 of the Clean Water Act of 1972 as amended in 1977 and Executive Order 11990. Species common to the wetland habitats include sandhill crane, long-billed curlew, snowy egret, American avocet, mallard, cinnamon teal, eared grebe, muskrat, and leopard frog. Coniferous forest habitat occurs above about 8500 feet and is used by Steller's jay, pine siskin, and gray-headed junco. Areas south of the County predominantly consist of desert shrub habitat utilized by bighorn sheep, loggerhead shrike, and vesper sparrow, while desert tortoise occur more prominently in the southern portions of Clark County.

Raptors nesting in the County include ferruginous hawk, goshawk, prairie falcon, golden eagle, Cooper's hawk, American kestrel (sparrow hawk), and red-tailed hawk. Bald eagles, a federally listed endangered species, are known to winter in the County, but are not known to occur during other seasons. Peregrine falcons, occasional migrants, have also been sighted in the County. Additional wildlife species occurring in the WPPP region that are under consideration by the U.S. Fish and Wildlife Service (USFWS) for consideration for listing as threatened or endangered and are of special concern to the Nevada Department of Wildlife (NDOW) include the spotted bat, ferruginous hawk, Swainson's hawk, white-faced ibis, long-billed curlew, and desert tortoise.

3.1.4.4 Aquatic Ecology

A partial list of aquatic species found in the WPPP region is included in Table 3-4. Aquatic resources of the County consist primarily of small streams and reservoirs and cool to warm springs. Most streams originate in the mountains adjacent to the valleys and, during the arid seasons, terminate before reaching the alluvial valley floors. Aquatic stream habitat is restricted to the cooler and relatively moist mountain ranges. Springs occur adjacent to the mountains, and their flow usually terminates within a short distance from the spring head. Aquatic habitat is usually limited to the spring head and associated pools. Exceptions include Comins Lake and Bassett Lake, located in south and central Steptoe Valley, respectively, and the Shoshone Ponds in southern Spring Valley. Bassett Lake is fed by Duck Creek, originating in the Schell Creek Range and Tailings Creek, originating from springs southwest of McGill. Comins Lake receives water from Steptoe Creek, Williams Creek, and Willow Creek. Game fish species inhabiting streams and reservoirs in the project area include rainbow trout, brown trout, cutthroat trout, brook trout, bass, crappie, and northern pike.

Pahrump killifish, a federally listed endangered species, inhabit the Shoshone Ponds in Spring Valley. The Big Springs spinedace, a species officially proposed for listing as threatened and endangered, inhabit Meadow Valley Wash in Condor Canyon. The White River spinedace, which inhabit the Preston Big Spring and Lund Town Spring areas, and the White River springfish, which inhabit the Flag Springs area, are also officially proposed for listing.

Additional aquatic species occurring in the WPPP region, currently under status review by USFWS, and of concern to NDOW, include, White River desert sucker, Preston White River springfish, White River speckled dace, Clover Valley speckled dace, Independence Valley speckled dace, Independence Valley tui chub, Meadow Valley Wash desert sucker or White River Desert Sucker, Meadow Valley Wash speckled dace, relict dace, and Bonneville (Utah) cutthroat trout.

3.1.4.5 Wetlands

There are no wetland areas in Butte Valley. There are approximately 15,000 acres of wetland areas in the parts of Steptoe Valley associated with the North Steptoe Valley Site. Approximately 60 percent are on public land and 40 percent are on private land. There are approximately 8300 acres of wetland areas in the parts of Spring Valley associated with the Spring Valley Site. Approximately 57 percent are on public land and 43 percent are on private land.

3.1.4.6 Threatened and Endangered Species

A biological assessment was prepared pursuant to Section 7 of the Endangered Species Act of 1973. This assessment is included in the Biological Assessment technical report. The Pahrump killifish inhabiting the Shoshone Ponds in Spring Valley and the overwintering bald eagle are the only listed species known to occur in the WPPP region. Three aquatic species, the Big Springs spinedace, the White River spinedace, and the White River springfish, are officially proposed species known to occur in the WPPP region. However, 9 plant species, 6 terrestrial wildlife species, and 9 aquatic species occurring in the WPPP region are under review by USFWS for consideration as threatened or endangered. The plant species are also protected by Nevada law, as administered by the Nevada Division of Forestry. All listed, proposed, and candidate threatened and endangered species in the WPPP region are listed in Table 3-5.

3.1.5 Cultural and Paleontological Resources

The following sections include baseline data on cultural and paleontological resources of the WPPP region. Additional information is included in the Cultural Resources Baseline technical report.

3.1.5.1 Archaeology

The pre-history of the County can be divided into several periods. The Pre-Archaic Period (12,500 to 8000 years ago) represents the earliest well-documented evidence of human presence in the Great Basin. Pre-Archaic settlement is marked by small sites located along features related to extinct water sources.

On the average, the environment during the Archaic Period (8000 to 750 years ago) was similar to that of the present. Technologically, the Archaic is more complex than the Pre-Archaic. Hallmarks of the period include a profusion of milling tools, basketry, and groundstone. A technological development, the bow and arrow, occurred late in the period.

The Archaic pattern prevailed until 1300 years ago. At that time, Fremont groups moved into the eastern part of the County. The dual occupancy of the County by Fremont and late Archaic peoples continued until 650 years ago, when both cultures were replaced by Shoshoni groups.

Circumstances relating to the origin of the Fremont Period (1500 to 750 years ago) are not certain. The expansion of grassland conditions about 1500 years ago allowed for the spread of Fremont groups who were dependent primarily on the collection of grasses and secondarily on horticulture. Fremont groups did not spread throughout the County, but were apparently halted by the presence of high, dry areas such as Butte Valley, Long Valley, and Newark Valley. The material culture of the Fremont Period is distinct from other cultural periods. Its most obvious indicator is pottery, the earliest in the County.

At approximately the same time as the Fremont Period, another cultural experiment was underway south of the County. Sites of the Virgin Branch Anasazi Period or Anasazi Period (2100 to 800 years ago) are most common along the Muddy River, the lower Virgin River, and Meadow Valley Wash.

The Anasazi Period has been divided into four phases. The first is the Moapa Phase (300 B.C. to A.D. 500) which is not well known. It is represented by pithouses on high bluffs above Moapa Valley and cultural deposits in several rockshelters in the region. Muddy River Phase (A.D. 500 to A.D. 700) sites consist of small clusters of pithouses situated on valley rims and on low knolls. Subsistence was based on a mixed farming and hunting/gathering economy and pottery appeared for the first time. Other artifacts found include the bow and arrow, slab and basin metates, and coiled and twined basketry. The Lost City Phase (A.D. 700 to A.D. 1100) is characterized by many of these same traits. Small villages consist of dwellings in a U-shaped arrangement and in rows. Cultivated crops include corn, beans, and squash. Cotton was grown and woven into cloth. The Mesa House Phase (A.D. 1100 to A.D. 1150) was short-lived and represents the end of Anasazi occupation of the region. Material traits are essentially the same as those of the preceding phase.

The Post-Fremont or Numic Period (950 to 100 years ago) represents the prehistoric forebearer of the modern Shoshoni inhabitants of the Great Basin. Present evidence suggests a gradual immigration of the new culture from 950 to 650 years ago. Sites in the County that contain evidence of Fremont and Post-Fremont occupations suggest alternating habitation or cohabitation over a period of some 100 years. By 650 years ago, only the Post-Fremont culture was found in the area.

The subsistence and settlement pattern of the Post-Fremont population is assumed to be the same as that of the historic Western Shoshoni. Subsistence activities were diversified. Close familiarity with the region and its resources allowed the scheduling of food gathering so as to maximize yield. The only real deviation from this gathering-oriented settlement pattern was the communal hunt. Hunts were sophisticated undertakings requiring a high technological investment and were conducted by members of several camp groups congregating specifically for that purpose.

Warfare was never a prevalent feature of Shoshoni life. Family feuds and revenge were the sole expressions of hostile activities. Both were considered the affair of a family or, at most, the household. Camp groups or larger aggregates did not draw together for the purpose of organized warfare.

3.1.5.2 History

The following sections include a brief history of the County. Figure 3-5 shows the locations of selected historical sites in the County.

NRHP sites in the area include: 1) Bristol Wells Townsite, charcoal ovens and structural remains of an old mining and smelting town; 2) Ward Charcoal Ovens, a series of beehive ovens used to produce charcoal for the Ward Historic Mining District; 3) Lehman Aqueduct and Rhodes Cabin, remains associated with the Lehman Cave National Monument; 4) the Fort Ruby and Fort Schellbourne Pony Express Stations, associated with the Pony Express and Overland Trials and Stagelines; 5) the White River Narrows Petroglyph District consisting of several localities of petroglyph panels; 6) the Nevada Northern Railway Depot; and 7) the Sunshine Locality National Register District which encompasses over 60 sites related to the Western Pluvial Lakes Tradition.

3.1.5.2.1 Exploration and Early Development

In 1826, fur trappers were the first Caucasians to enter northeast Nevada. The County was largely untouched by trapping activities since their focus was further north along the Humboldt River. A small company traversed the County in 1827, camping once near Conners Canyon in the Schell Creek Range and again north of Baker.

The County also escaped the influx of people fostered by the transcontinental migration during the 1840s and 1850s. During these years, transcontinental freight and passenger routes passed to the north and south of the County. However, a shorter alternative was sought and a new central route, which ran through the County, quickly developed as a major transportation and communication corridor. The Butterfield Overland Mail Company and, in 1860, Pony Express riders, used the central route. The first transcontinental telegraph line, completed in 1861, also followed the central corridor. The role of this corridor as a transportation artery declined in 1869 with the completion of the transcontinental railroad through the Humboldt Valley.

3.1.5.2.2 Indian/White Relations

The history of Indian/White relations in the County is similar to that recorded elsewhere in the Great Basin. Trappers and explorers were looked upon as curiosities by Indian people who were friendly and cooperative. The number of Whites increased slowly until 1849, the year of the gold rush to California. The level of habitat destruction resulted in Indians organizing for the purpose of retaliation, and reciprocal acts of violence became commonplace. With the arrival of the military, hostilities finally ceased in 1863.

3.1.5.2.3 Mining

Mining, the most significant industry in the County, has produced more mineral wealth than any other industry in Nevada. Historic mining districts are shown on Figure 3-5. The mining history of the County can be divided into the pre-1890 silver period and the post-1890 copper period.

Mineral deposits were first discovered in the County by station masters and soldiers. In 1859, employees of the Overland Stage Company discovered silver and gold ores in Pleasant Valley. In 1861, a company of volunteer soldiers on their way from Fort Schellbourne to Fort Ruby discovered a gold-bearing ore in Egan Canyon. The Cherry Creek District was formed in 1863, and the first mill in eastern Nevada was constructed in 1864. Limited exploration was also undertaken elsewhere in the County. In 1875, the Ward District, located west of southern Steptoe Valley, became the focus of mining activities. Its boom lasted about five years. Cherry Creek (1880-1883) and Taylor (1881-1885) absorbed people from the Ward District. With the decline of mines in these areas, the silver mining period ended.

As high grade gold and silver ores diminished, interest increased in high-volume, low-grade ores. In Nevada, the most important of these was copper. Miners first became aware of copper in the Robinson District in the early 1870s. However, exploration did not begin until 1903.

Encouraged by the advancement of technology, entrepreneurs and miners converged on Ely and the town grew. The Nevada Consolidated Copper Company initiated underground exploration of the lode and built a small experimental concentrator. In 1906, a railroad was built to connect with the Central Pacific at Cobre. Shortly thereafter, Guggenheim financial interests purchased the Nevada Consolidated Copper Company and began construction of a mill, reduction plant, and processor at McGill (later to become the McGill smelter), and production began in 1908. The Ruth Copper Pit mine west of Ely was next developed, later to be owned and operated by Kennecott.

3.1.5.2.4 Settlement

The history of White settlement in the County dates back to the early 1860s. The Ruby Station and Egan Station were the earliest settled areas. Pleasant Valley and Antelope Valley, in the northeast corner of the County, were the scene of the earliest ranching activities. The first settlements of consequence owed their existence to mining in the White Pine District and included the towns of Monte Cristo, Hamilton, Eberhardt, Shermantown, Swansea, and Treasure City. During the boom period (1868-1873), more than 30,000 people resided in these communities.

As new mining districts developed, communities formed. Mining districts that were small but steady producers supported stable communities. Ely, first known as Murry Creek, and Cherry Creek were settled in the 1860s and 1870s.

The turn of the century marked a transition in the history of settlement in the County. The prime mover was the shift to copper mining. Unlike the earlier silver period, the capital investment required was high, and large corporations became dominant early on. McGill, Ruth, Kimberly, and Veteran developed as "company towns," planned communities built and run for the convenience of the company and its employees. The company town did not permit gambling, the sale or consumption of alcohol, or prostitution. As a result, "saloon towns," including Ragtown, Riepetown, Smelterville, and Steptoe City, were developed.

3.1.5.2.5 Agriculture and Ranching

Agriculture and ranching began in the County as support industries, supplying commodities to isolated mining communities. Initial development took place between 1865 and 1875. By the mid-1870s, ranching and agriculture had reached a developmental plateau.

Compared to mining, agriculture played a small role in the development of communities and few towns owe their origin to this industry. Not until the 1890s were agricultural settlements such as Lund, Preston, and Baker established, signaling a period of marked expansion in the ranching and agriculture industries.

3.1.5.3 Native American Considerations

The primary Native American group in the WPPP region is the Shoshoni. The Shoshoni do not make an absolute distinction between secular and sacred aspects of life. The spiritual world is ever-present and not necessarily removed from the everyday activities of the group. Therefore, the environment is considered sacred due to its immediate association with the spirit world. Some parts of the environment are more sacred than others (e.g., burials, caves, rock art, and thermal springs). Mountain ranges, sites of recent historic significance, trails, ceremonial sites, lakes, and traditional use areas have a more general, nonspecific sacred association.

In contrast to many parts of the country, a majority of contemporary Native Americans in Nevada and Utah occupy lands once held by their ancestors. This contributes to a strong sense of continuity with the past and accentuates the ties between modern Indian people and traditional beliefs, practices, and resources. Although many nontraditional technologies and patterns have been adopted, contemporary Native Americans have not modified their views on the sacred nature of their ancestral lands. For them, the universe is based on the principle that reciprocity and continued modification of the natural order can only result in negative reprisal of one form or another.

Continued use of the flora and fauna in a traditional manner is seen as an important element in maintaining cultural identity, and many traditional patterns of use persist. For many Native Americans, hunting and gathering (especially pinyon nuts) contribute significantly to dietary needs, and access to procurement areas is a sensitive issue. Aside from their role in providing sustenance, plants and animals play a vital role in folklore.

3.1.5.4 Paleontology

The earliest geological evidence in the County is the late Precambrian McCoy Creek Group of quartzites and schists found in the Cherry Creek Range, Egan Range, Schell Range, and Snake Range. From Precambrian until early Mesozoic time, eastern Nevada was part of the Cordilleran miogeosyncline, a subsiding trough in which deposits accumulated. The materials representative of this period contain shallow marine deposits. Cambrian Period strata contain trilobites and are significant where these important fossils are present.

Several strata of the Paleozoic Era have moderate paleontological potential. The Ordovician Poqonip group contains marine invertebrates (mostly mollusks and algae). Devonian Period fossil-bearing strata include the Simonson dolomite and Guilmette Formation. The Joana Formation is the only unit in the County dating to the Mississippian Period, appearing to be highly fossiliferous and containing abundant corals, brachiopods, mollusks, and crinoids. Permian Period strata contain the majority of paleontological resources found in the County and account for most localities recorded to date. Figure 3-6 shows paleontological localities in the County.

Evidence of only limited sedimentary deposition exists in the County for the Cenozoic Era. Most of what is present dates to the Miocene Epoch when infilling of structural and sedimentary basins occurred. Although limited in extent, these deposits are rich in paleontological deposits.

The Quaternary Period of the Cenozoic Era is noted for climatic oscillations resulting in the development of glacial ice and related pluvial lakes. Deposits dating to the period consist of a variety of alluvial deposits, and none has much potential for paleontological resources.

3.1.6 Visual Resources

The following sections include baseline data on visual resources of the WPPP region. Additional information is included in the Visual Resources Baseline technical report.

3.1.6.1 Landscape Characteristics

The WPPP region is characterized by a series of north-south trending mountain ranges separated by open flat valleys. Elevation differences between mountain peaks and valley floors are as much as 7000 feet.

The area is generally arid, resulting in a sparse vegetation distribution and few perennial surface water features. The arid climate limits agricultural activity to livestock grazing/ranching and irrigated farming. Natural vegetation patterns are largely determined by elevation. Scenic views throughout most of the region are primarily open.

In general, views are restricted by local topographic relief, and occasionally by vegetative cover.

In general, the WPPP region is natural and rural in character, exhibiting comparatively little cultural modification to the natural landscape. In addition to the few urban centers in the region (Ely, McGill, Ruth, and other smaller communities), significant manmade features include regional highways, railroads, transmission lines, mines, and the McGill smelter.

Regional landscape conditions are shown on Figure 3-7. The region is classified into natural, dominant, manmade dominant, and industrial landscapes, according to the methodology described in the Visual Resources Baseline technical report. In addition, Figure 3-7 shows areas of particular scenic importance which include national parks and recreational areas, national forests, BLM Visual Resource Management (VRM) Class 1 areas, scenic areas, and BLM WSAs. Together, the steep mountain slopes, flat open valley physiography, and the predominantly rural character of the region create a landscape of interesting scenic views.

The landscape of east-central Nevada is characteristic of the American West. The open country, largely absent of dense vegetation or manmade development, lends itself to wide and distant scenic vistas. Consequently, an observer's visual attention is generally not directed at any specific elements within the landscape.

The landscape is frequently viewed by persons traveling on highways for recreational or commercial purposes. Often, the origins and destinations of these travelers lie outside the region. Other viewers include local residents engaged in hunting, fishing, and other recreational activities, who frequently enjoy the aesthetics of the back-country. With the exception of the Lehman Caves National Monument, the Lake Mead/Las Vegas area, and some areas in the Humboldt National Forest, the WPPP region does not attract large numbers of recreational visitors from other parts of the country.

3.1.6.2 Visual Resource Management Classifications

The BLM has mapped VRM classifications (classes) for portions of the WPPP region. These VRM classes are shown on Figure 3-8. According to BLM, these classes describe the different degrees of modification allowed to the basic elements of the landscape. Five VRM classes are possible and are described below as they appear in the BLM VRM guidelines:

- Class 1 - Natural ecological changes and very limited management activity are allowed. Any contrast created within the characteristic landscape must not attract attention. This classification is applied to wilderness areas, wild and scenic rivers, and other similar situations.

- Class 2 - Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape. Changes are seen, but must not attract attention.

- Class 3 - Contrasts to the basic elements caused by a management activity are evident, but should remain subordinate to the existing landscape.

- Class 4 - Any contrast may attract attention and be a dominant feature of the landscape in terms of scale, but it should repeat the form, line, color, and texture of the characteristic landscape.

- Class 5 - This classification is applied to areas where the natural character of the landscape has been disturbed to a point where rehabilitation is needed to bring it up to one of the other four classifications. The classification also applies to areas where there is potential to increase the landscape's visual quality. It would, for example, be applied to areas where unacceptable cultural modification has lowered scenic quality; it is often used as an interim classification until objectives of another class can be reached.

- Other: In the absence of officially adopted VRM classes, some areas are assigned an interim Class 3 designation.

VRM classification throughout the WPPP region is based upon a number of factors, including scenic quality, sensitivity, and distance from viewing public. As shown on Figure 3-8, most of the WPPP region is occupied by VRM Class 3 land (either interim or adopted) and Class 4 land. Much of the central and southern portions of the region, including Spring Valley, are designated as VRM Class 4. Class 3 lands, which are more visually sensitive than Class 4 lands, include some forested areas at upper elevations, such as parts of the Delamar Mountains, Clover Mountains, and the portion of the Snake Range which includes Sacramento Pass.

Class 2 lands are more sensitive than those designated Class 3 and include portions of the Schell Creek Range, Egan Range, and Wilson Creek Range.

Class 1 describes the most scenic and visually sensitive landscapes. Class 1 lands within the WPPP region include: 1) Virgin Peak, located in the Virgin Mountains in the southeast part of the region; 2) North Creek and Mount Grafton Scenic Areas, located in the southern Schell Creek Range; and 3) Blue Mass Canyon, located in the Kern Mountains in the northeast part of the region.

Scenic qualities are also valuable components of WSAs. The scenic qualities are protected through the Wilderness Interim Management Policy, which directs the BLM to preserve these areas in their natural condition.

3.1.7 Socioeconomics

The County is a rural area located in the east central part of Nevada. The County is currently in a social and economic transition since Kennecott closed its copper mine and curtailed operations at the McGill smelter. The City of Ely, the County seat, is located between the smaller communities of Ruth and McGill in the south central portion of the County. The nearest major population centers to Ely are Reno (300 miles west), Salt Lake City (240 miles east), and Las Vegas (260 miles south).

The majority of County land (97 percent) is publicly owned and administered by the federal government. These lands are principally administered for agricultural, mining, and recreational uses. The land in agricultural use is leased for livestock grazing, historically a vital part of the local economic base.

The following sections include baseline data on socioeconomic characteristics of the County. Additional information is included in the Socioeconomic Baseline technical report and in the Quality of Life technical report.

3.1.7.1 Demographic Characteristics

3.1.7.1.1 Population Trends

The population changes in the County and its principal cities, and in the State of Nevada, between 1940 and 1982 are summarized in Table 3-6. Population estimates of the County for 1982 indicate a population of 8470 persons. Between 1980 and 1982, population increased approximately four percent, or 303 persons. For the same period, the state population increased 11 percent.

The population of the County declined 20 percent between 1970 and 1980, from 10,150 to 8167 persons. The closing of the Kennecott copper mine, a shutdown which began in 1976 and was completed in 1978, accounted for most of this decline. The Town of Ruth, west of the City of Ely and nearest to the Kennecott mine, experienced a 38 percent decrease in population between 1970 and 1980. The Town of McGill, north of Ely and the site of the McGill smelter, experienced the second largest population decline (34 percent) in the County during this period. These communities, essentially company towns, were more vulnerable to the mine closure compared to the City of Ely, whose population decreased 21 percent between 1970 and 1980.

Although the population declined in the County urban areas between 1970 and 1980, the County rural population increased by 30 percent. This increase may relate to former Kennecott employees returning to their farms and/or self-employed status outside of the County urban centers.

3.1.7.1.2 Population Profile

Table 3-7 includes selected demographic characteristics of the County. These data indicate that the County population distribution between males and females is almost equal, similar to that of the State of Nevada. The population is mainly Caucasian. Ethnic groups include people of Basque and Hispanic descent. Average houshold size is 2.68 which is slightly larger than the statewide average of 2.35 persons. Both averages are smaller than the national average of 2.75 persons per household. In 1970, 55 percent of County residents who were 25 years and older were high school graduates (the comparable national average was 52.3 percent).

The Kennecott mine closure between 1976 and 1978 resulted in a net out-migration rate of 28 percent. In contrast, the state experienced a net in-migration rate of 53 percent.

3.1.7.1.3 Projected Population

Three sets of population projections to the year 2000 for the County are listed in Table 3-8. One projection was based on a cohort survival model prepared by the Nevada State Planning Coordinator's Office (PCO), and the other two were based on a Demographic/Economic Impact Simulation Model (DEISM) employed by the PCO. The latter population projections considered anticipated economic development in the County with and without the M-X Program. The PCO cohort survival model projects a low estimate of population growth, while the DEISM model projects moderate and maximum growth estimates.

The moderate growth population projections listed in Table 3-8 are currently considered the most representative of a reasonable future growth estimate for the County for the following reasons:

- The basing of M-X Program facilities in Nevada is not likely, which effectively removes the maximum growth projections from consideration.

- The low growth population estimate is not likely because of renewed interest in developing local natural resources in the County.

The low growth population projection for 1995 is 14 percent below the moderate growth population projection of 9757. The high growth population projection for 1995 is 11 percent greater. A reasonable range of forecasting error in the moderate growth population projection is judged to be approximately five percent.

3.1.7.2 Employment and Economic Base

The most prominent employment sectors in the County economy have historically been mining, government, trade, and services. The phased closing of the Kennecott copper mine from 1976 to 1978 caused mining to drop from the largest to fourth largest employment sector. Currently, the leading sectors are government, trade, and service industries. Important growth sectors in the County economy between 1971 and 1980 were farming, construction, transportation and public utilities, and services.

3.1.7.2.1 Employment Profile

Table 3-9 summarizes the labor force and unemployment changes for the County between 1970 and 1983. The peak labor force in the County during the 1970 to 1980 period was approximately 4200 persons in 1970. Since that time, the total labor force has fluctuated, reaching a low of 3090 in 1976, which represented a 25 percent decrease since 1970. Between 1979 and 1981, however, the County labor force regained the percent loss in labor force because of several new mining and mineral exploration activities and speculation that the M-X Program might be located in the area. The seasonally adjusted County unemployment rate ranged from six percent of total labor force in 1970, to 24 percent in 1976, a year after the Kennecott mine operation began phasing out. The 1981 County unemployment rate was 6.7 percent of total labor force, comparable to the 7.1 percent state average. The unemployment rate for the County increased to 18.0 percent in 1983, which was substantially higher than that for the state which was 9.8 percent.

3.1.7.2.2 Employment Projections

Projections of covered employment indicate that total employment in the County will increase by approximately ten percent by the year 2000. These increases have been projected based on renewed interest in mining of precious metals in the County, as evidenced by the Amselco (Alligator Ridge) mine which began operations in 1981. The projections indicate that the mining (44 percent) and finance, insurance, and real estate (46 percent) sectors should grow most quickly, with the largest decline expected in the agricultural services, forestry, and fisheries sectors (a loss of 31 percent).

3.1.7.3 Income

Between 1970 and 1980, personal income in the County grew only 7.5 percent annually compared to an average annual state increase of 14.3 percent. Approximately 75 percent of state and County personal income was from personal earnings.

Non-farm earnings (wage and salary plus proprietors income) represent the majority (97.2 percent) of earnings in the County. Approximately 78 percent of non-farm earnings was generated in the private sector and 20 percent was generated by government. Farm earnings decreased to about three percent of the County total between 1970 and 1980, consistent with state and national trends. In 1980 the mining sector accounted for 14 percent of total private earnings, far in excess of the state rate.

The mining, manufacturing, and government sectors accounted for 50 percent of 1980 personal income in the County. The comparable state and national average was 23 percent.

The County average per capita income was consistently 14 to 20 percent below the state average between 1970 and 1980. After 1978, the average per capita income in the County fell 21 percent below the state average, compared to 14 percent below in 1975.

County family income appears to have remained stable in relation to the state average. The U.S. Census estimated the median family income in the County at $9111 in 1969, which was 85 percent of the state median family income. The State of Nevada Employment Security Department (ESD) estimated that, by 1980, County median family income grew to be $18,728, or 84 percent of the state median income of $22,227.

Between 1979 and 1995, total personal income and average wage per worker are projected to increase in the County. Per capita income, however, is expected to decrease somewhat. The projections assume that wage rates in the County will rise in proportion to national wage rates, and that labor force participation rates will be constant. However, County per capita income, as a percent of national per capita income, is assumed to drop from the 1970 average of 95 percent to 73 percent due to the loss of mining jobs.

3.1.7.4 Housing

Table 3-10 summarizes pertinent housing characteristics in the State of Nevada and the County. In the past decade, the number of housing units in the County has expanded by eight percent. During this same period, the total number of occupied housing units declined by five percent. As a result, the vacancy rate in the County over the past decade has almost tripled, rising from six percent in 1970 to 16 percent in 1980. Total estimated number of housing units for the County in 1980 was 3566 units.

The increase in total housing units was primarily due to an increase in the number of single family units (245) constructed between 1970 and 1980. The net increase in total housing units in the County also reflects an increase in the number of multiple units by some 90 units. The proportion of mobile homes in the County to total housing stock declined by 2.5 percent over the past decade. The total number of mobile homes in the County declined by about 60 units.

Another factor contributing to the net increase in total housing units in the County was the replacement of inhabited substandard housing units. The majority of County housing stock was constructed before 1940 when the population peaked at about 12,500 persons. It is probable, therefore, that a good portion of the County housing stock could well be marginally habitable due to its age and questionable construction practices during the 1940s.

The principal contributing factor in the decline of occupied housing units was an overall reduction of 11 percent in renter-occupied units. However, total number of owner-occupied units also declined slightly (one percent) over this same period. These trends significantly contrast with state increases in owner-occupied and renter-occupied units of 95 percent and 85 percent, respectively. However, they are consistent with the dramatic decline in County population (20 percent) that was experienced over the last decade.

The majority of housing is located in Ely Township, which is a census enumeration district that includes Ely, Ruth, McGill and Cherry Creek. Vacant housing was 15.4

percent of the total number of units (3302) located in Ely Township. The highest vacancy rates are found in the outlying areas of the County, particularly in those areas hit hardest by the closure of the Kennecott mine and McGill smelter (i.e., McGill and Ruth).

3.1.7.5 Education

During the early 1970s, when Kennecott was in full operation, school enrollments in the County stood at about 2600 students, close to the 2700-student capacity of the White Pine County School District (WPCSD). Since then, enrollment has fallen to its present level of about 1500 students, approximately 60 percent of the WPCSD capacity. Enrollment is anticipated to stabilize over the next few years.

Table 3-11 lists educational facilities in the WPCSD. Capital improvements are required if the system is to operate at or near its design capacity of 2700 students. These facilities are, for the most part, older buildings which need upgrading to meet fire standards and to reduce maintenance costs. For some time, the school board and community have planned to build a junior/senior high school complex to replace some of the older facilities in the district. However, the recent uncertain economic prospects for the area have reduced the possibility of property tax funding for such a project.

The WPCSD has not had problems with accreditation. The average enrollment per teacher is 21.2 students, below the state average of 22.5 students. The average expenditure per student for the 1980-81 school year was $1662, slightly above the state average due to the lower student-teacher ratio and higher transportation costs in the County.

3.1.7.6 Public Health and Safety

Table 3-11 lists data regarding public health and safety. As this information indicates, only agencies in Ely provide public health and safety services.

3.1.7.7 Community Infrastructure

3.1.7.7.1 Transportation Systems

The County maintains 1300 miles of primary roads and 1800 miles of secondary roads. Major roads in the County are shown on Figure 3-9. The City of Ely maintains city streets for which an improvement plan is being prepared. Major city and County roads are listed with their 1980 average daily traffic (ADT) volumes and capacities in Table 3-12. Although the ADT is generally below the rated capacities of the roads listed, many roads managed by the City of Ely, the County, and the state require, or will require, improvement. The City of Ely street system has about 30.5 miles of improved and unimproved streets, with 80 percent in need of repairs. Some required repairs are extensive due to lack of good base material and the age of the asphalt surface. Such collector streets as Campton Street, Ogden Avenue, Lyons Avenue, North Street, Avenue "C", 13th Street, and Avenue "M" are in need of repair work. The Georgetown Ranch Road, managed jointly by the City of Ely and the County, should have roadway width and alignment improvements. It is expected that baseline population growth along the McGill Highway area will increase the use of this road.

The NNRy, a subsidiary of Kennecott, provides freight service to Ely using connections with the SP and WP in Elko County. The freight line is used by the McGill smelter and is adequate for current use. However, because the smelter is currently not operating, Kennecott has suspended operations on the NNRy.

Yelland Airfield, operated by the County, has two runways and is classed as a "trunk airport" which can accommodate carrier-type aircraft. Approximately 5300 passengers were serviced in 1978. This figure has remained stable and less than 20 percent of the airport capacity is currently used. Plans were underway to extend the runway and general aviation facilities. However, a 1980 FAA ruling denied provision of federal funds to the County for such an extension.

The airport services commercial flights and local area charter flights. Sky West Airlines currently provides commercial flight service to and from Yelland Airfield.

3.1.7.7.2 Utility Systems

Table 3-13 includes information on the water and sewer systems in County communities. For the most part, capacities of these municipal infrastructure systems are old but serviceable.

3.1.7.8 Recreation and Wilderness

3.1.7.8.1 Recreation

Community recreational facilities provide opportunities for developed and organized activities such as golf, swimming, softball, bowling, and tennis. Parks, playgrounds, and other community recreational facilities appear to be adequate given the number of federal and state facilities available. However, there is a need for multi-purpose courts, playlots, and winter recreation trails.

The County has a number of natural resources and cultural facilities that are popular for sightseeing, camping, fishing, hunting, biking, and picnicking. These include:

- Lehman Caves National Monument
- Wheeler Peak Scenic Area
- Cave Lake State Park
- Ruby Lake National Wildlife Refuge
- Ward Charcoal Ovens
- Ward Mountain Area
- Comins Lake
- Illipah Reservoir
- Duck Creek Basin picnic grounds and campgrounds
- Success Loop Scenic Drive
- Ghost towns such as Hamilton and Taylor

County streams and lakes provide many opportunities for water-based recreational activities. The Country has 156 recreational sites, the second largest number in Nevada, many of which are camping facilities. The County registered the highest visitor attendance for water-oriented recreation facility usage outside of the Reno, Carson, Tahoe, and Las Vegas areas of Nevada. Nearly 500,000 visitor days were estimated for 1970.

Dispersed, backcountry recreation is the predominate type of outdoor recreation in the County. Primitive, back-country opportunities are abundant. The backcountry provides solitude and a base for activities such as hunting, fishing, trapping, rock climbing, rock hounding, winter sporting, camping, sightseeing, day hiking, backpacking, pine nut gathering, horseback riding, picnicking, and off-road vehicle (ORV) driving. These outdoor activities are held in high regard by local residents.

Developed picnic areas and campsites are provided by the Nevada Division of State Parks, the USFS, and the National Park Service. These sites are generally not used to capacity. Only on holiday weekends during periods of good weather is there a probability of these sites filling to capacity. The exception is Cave Lake State Park campground, which had an average 90 percent capacity during the 1983 season.) USFS-developed sites in the Schell Creek Range, Ruby Mountains, and the Snake Range average a 36 percent occupancy rate. Many of the best campsites (e.g., those that are flat, shady, easily accessible, and within a reasonable commuting distance from Ely) have been in use for decades. Both BLM-administered and USFS-administered public lands are open to camping in most undeveloped areas.

Backcountry sites (accessible by unimproved roads) include hundreds of backcountry campsites which have been defined through use and which are used regularly, some fishing streams, caves, and specific sightseeing areas for botany, zoology, geologic, historic, archaeologic and other values.

The BLM Ely District is open to ORVs. The Humboldt National Forest is open to vehicles on existing roads and trails, with a few seasonal road closures. Most off-road use actually occurs on existing backcountry trails.

The County is one of the primary big game hunting areas in Nevada. Mule deer are the primary big game, but antelope, Rocky Mountain elk, and mountain lion are also hunted on a limited basis. The big game tag quota system is currently over-subscribed for deer, elk, and antelope tags. Trappers in the County harvest over 2000 fur bearers each year. There is also a variety of game birds hunted during the fall season. Poaching of wildlife is currently a problem in the County.

3.1.7.8.2 Wilderness

Under Section 603 of the Federal Land Policy and Management Act (FLPMA), the BLM has identified areas in Nevada with wilderness characteristics. These WSAs are currently under study by the BLM to determine their suitability for preservation and protection as wilderness areas.

Only one WSA (the Goshute Canyon WSA) is located entirely within the County. Portions of two other WSAs (the Mount Grafton WSA and the South Egan Range WSA) are located in the southern part of the County. These and other WSAs in the WPPP region are shown on Figure 3-7 and listed in Table 3-14. None of the three WPPP sites are located within any WSAs.

The Goshute Canyon WSA is located about 10 miles northwest of the North Steptoe Valley Site and about 25 miles northeast of the Butte Valley Site. This WSA is preliminarily recommended as suitable for wilderness designation in the Egan Wilderness Draft Environmental Impact Statement. The area is easily accessible around the perimeter and both maintained and unmaintained roads extend into the area. The interior, however, is generally accessible only on foot or by horseback. The area contains Goshute Cave, Goshute Creek, and the Upper Basin which serve as recreational focal points. Wilderness values include outstanding opportunities for solitude, outstanding diversity and quality of recreation opportunities, and high scenic values.

The Mount Grafton WSA is located approximately 20 miles southwest of the Spring Valley Site. Access into the area is generally by 4-wheel drive vehicle. This WSA is preliminarily recommended for wilderness designation in the Schell Wilderness Environmental Impact Statement. Specific recreational attractions include the Mount Grafton ridgeline, North Creek, and the North Creek campsites. Wilderness values include outstanding opportunities for solitude and high scenic values.

The Mount Grafton WSA and the South Egan Range WSA nearly join in northern Cave Valley. Only the width of a graded road separates the two WSAs. Alternative corridors for rail transportation and power transmission system and the coal transportation system pass through this area. The South Egan Range WSA is preliminarily recommended as nonsuitable for wilderness designation in the preferred alternative of the Egan Wilderness Draft Environmental Impact Statement. However, the corridor would not be feasible until the WSA is acted on by Congress.

Currently, the only designated USFS wilderness area in Nevada is the Jarbidge Wilderness located in northern Elko County approximately 300 miles north of Ely. The Humboldt National Forest is currently reevaluating all of its roadless areas for possible designation. At the present time, there are no designated wilderness sites within 150 road miles of any of the three WPPP sites.

3.1.7.9 Land Use

The County contains approximately 8905 square miles. Land ownership is shown on Figure 3-10 and listed in Table 3-15.

3.1.7.9.1 Public Land

Approximately 97 percent of County land is public land managed by BLM, the USFS, the Bureau of Indian Affairs (BIA), and the USFWS. The BLM and USFS lands are under multiple-use management for grazing, hunting, forestry, fishing, mineral extraction, rangeland, recreation, and wildlife habitat.

The BLM is responsible for the majority of land in the County (77 pecent) and is currently evaluating its lands for potential wilderness designation; livestock, wildlife, and wild horse grazing utilization; and public land areas that would be more appropriately managed in private ownership.

The BLM has two resource areas within its Ely District for which Resource Management Plans are being developed. All of the County lies within the Ely District which also encompasses portions of Lincoln and Nye counties. The Egan Resource Area is located in the western portion of the District and the Schell Resource Area in the eastern portion. The Schell Management Framework Plan was completed in July, 1983. The Egan Resource Management Plan is scheduled to be finalized in 1984.

The USFS manages national forest lands within the County. The agency is in the initial phases of developing a management plan for national forest lands under its jurisdiction which will outline management guidelines. The USFS will be making its wilderness recommendations through its forest plans. The Goshute Indian Reservation and Ely Colony are managed through their respective Tribol Councils in conjunction with the BIA. The USFWS manages the Ruby Lake National Wildlife Refuge, of which the southern part is in the County.

3.1.7.9.2 Private Lands

Agricultural, vacant, and developed acreage estimates have not been made for the County. Most of the 306 square miles of private land is used for agriculture. Agricultural land is concentrated in County valleys including

Steptoe Valley, Spring Valley, and Newark Valley, as well as in the Preston/Lund area in the southern part of the County. The majority of County agricultural land is used for pasture and rangeland. Hay production accounts for about 80 percent of harvested cropland.

3.1.7.10 Government and Finance

3.1.7.10.1 Local Government Structure

The three major governmental units are the County, the WPCSD, and the City of Ely. The County is governed by a Board of Commissioners and is responsible for assessment and recording, County roads, County sheriff, and the courts. The County also administers the budgets of the communities of Ruth, McGill, Baker, and Lund, and contributes to the Regional Planning Commission, the Ely Fire Department, and the cemetery.

The City of Ely government consists of a mayor and council which administers streets and roads, sanitation, water, police and fire protection (police protection is contracted to the County), the cemetery, and parks and recreation. The WPCSD is governed by an elected board which administers schools and support services for the entire County.

3.1.7.10.2 Public Finance

Table 3-16 lists the relative contribution to local government general funds for each major revenue source for fiscal year 1981-1982. The State of Nevada has no personal income tax.

Both the City of Ely and the County depend heavily on sales tax receipts. The County budget relies on a diverse set of revenue sources. Except for sales tax-derived revenues (e.g., City/County Relief Tax and intergovernmental tax revenues), transfers from other local governments and property taxes are the primary revenue sources. The City of Ely derives more revenue from licenses and fees than from property taxes.

The WPCSD receives the majority of its revenue from the state distributive fund, which derives its revenues from statewide gaming taxes. The second most important source of income for the WPCSD is the local school support tax.

3.1.7.11 Quality of Life

Quality of life consists of social indicators and satisfaction with life. Social indicators are generally published statistics which characterize a community. Social indicators, however, do not yield much information on community social structure, or on social institutions and their functions. The satisfaction with life component of quality of life is a person's response to his or her overall life situation. It is a subjective response based in part on the person's social class, prestige, and social importance to other people in his or her overall group and/or community.

The two primary inputs for satisfaction with life analysis in the County include a statistical survey conducted in 1979 and a community leader survey conducted in 1982. Although three years separate the two studies, the results of the community leader survey indicate that many of the conclusions drawn by the earlier survey are still valid.

With regard to the existing setting, the quality of life in the County has historically been high. The relatively poor social indicators at times have been more than offset by a high satisfaction with life. The satisfaction with life component has been dependent upon: 1) a fluid class system allowing satisfactory social mobility; 2) a tolerable and stable economic activity; 3) the small town atmosphere; 4) the scenic and recreational setting; and 5) the strong community integration of the various social groups through such mechanisms as churches and service organizations.

However, the satisfaction with life component of quality of life in the County is presently deteriorating. The primary causes of the deterioration are: 1) lack of employment, especially in traditional blue collar occupations; 2) increasing political factionalism in the wake of declining involvement in the community by Kennecott; 3) ineffectual decision-making in dealing with economic problems; and 4) insufficient integration of young people (age 20 to 35 years) into the community.

Unless these trends are reversed, the satisfaction with life decline may expand beyond the groups presently most affected (i.e., young people, blue collar workers, and transients) to include professionals and business people. Such a decline could ultimately result in more population loss, including persons most needed to revitalize the community.

3.2 SITE AND CORRIDOR SETTING

This section describes the existing environmental conditions of the three WPPP sites and, where appropriate, associated corridors for lineal facilities. The latter consist of transmission line corridors, well fields and water pipeline corridors, and railroad corridors. The level of data for the three WPPP sites is greater than for the corridors. In addition, the level of detail is greater for corridors within the County than outside the County where baseline data does not exist or is not at a comparable scale.

3.2.1 Earth Resources

The following sections include baseline data on earth resources of the three WPPP sites. Additional information is included in the references listed in Chapter 7.

3.2.1.1 Butte Valley Site

3.2.1.1.1 Physiography

The Butte Valley Site is located in the southwestern portion of Butte Valley between the Butte Mountains on the west, the Cherry Creek Range on the northeast, and the Egan Range to the south and east. Site elevations range from a maximum of 6765 feet in the west central portion to 6248 feet in the northeastern corner. Slope gradients of up to 25 percent occur locally in the area of bedrock outcrop in the west central portion of the site. Most of the site, however, is characterized by easterly to northeasterly slope gradients ranging from three to four percent in the upper portions of the alluvial fans in the western part of the site to less than 0.5 percent in the northeastern corner of the site. Shallow, incised drainages with up to three to four feet of relief trend generally northeast across much of the site.

3.2.1.1.2 Geology

Alluvial fans are the predominant unit on all but the northeast corner of the site where lake deposits are present. Alluvial fan units of intermediate age with dissected sloping surfaces are exposed in the western portion of the site. Surface soils consist mostly of loose to weakly cemented sand and sandy silt with some gravel. The central portion of the site contains relatively younger, fine-grained alluvial fan deposits that overlie and interfinger with the coarse-grained intermediate age fan deposits to the west and fine-grained lake deposits to the east. Soils of the young fan deposits consist of loose to weakly cemented silt and sandy silt with occasional lenses of gravel.

Lake deposits predominate in the northeast portion of the site. The fine-grained lake deposits consist mostly of silt and sand to a depth of nearly 100 feet as evidenced by soil boring data. Although these deposits occupy only a small portion of the site at the surface, the soil boring data suggest they extend laterally to the west beneath alluvial fan deposits at depths of between approximately 5 and 50 feet.

Small linear sand bar deposits exposed in the east central portion of the site consist almost entirely of sand. These sediments are probably no more than five feet thick and represent late Pleistocene shoreline deposits.

Bedrock exposed in the west central portion of the site consists of limestone and minor sandstone of Paleozoic age.

3.2.1.1.3 <u>Seismicity</u>

Seismicity is a regional phenomenon and is discussed in a regional context in Section 3.1.1.3.

3.2.1.1.4 <u>Geologic Hazards</u>

The Butte Valley Site is transected by the Butte Valley fault zone and is situated within ten miles of the west Steptoe Valley fault zone (Figure 3-2). Both of these faults are capable of generating earthquakes of Magnitude $\geq$ 6. However, due to the relatively long recurrence intervals for this type of fault, the potential for strong ground motion at the Butte Valley Site within the next 50 years is low.

Two northeast-trending, photolineaments (fault-related features identified on aerial photographs) trend across the southeastern portion of the Butte Valley Site (Figure 3-11) and appear to be related to the South Butte Valley fault zone. This fault zone is about ten miles long and is a primary block-bounding fault between the uplifted Cherry Creek Range and the downdropped southern Butte Valley. Scarps along the fault zone are conspicuous northeast and southwest of the site. The fault displaces late Pleistocene (last 120,000 years) or Holocene (last 11,000 years) shoreline deposits. The two lineaments on the site do not have any topographic expression although their alignment with the fault zone suggests that they are fault-related. It is conceivable that future displacements on the South Butte Valley fault zone could be accompanied by surface rupture along the lineaments on the Butte Valley Site.

Due to the relatively long earthquake recurrence intervals for major Basin and Range faults such as the South Butte Valley fault zone, the potential for surface fault rupture to occur at the Butte Valley Site within the next 50 years is low.

Preliminary geotechnical investigation of the Butte Valley Site did not encounter any extensive deposits which would be susceptible to liquefaction or dynamic settlement. In addition, the water table is deeper than 50 feet and liquefaction should not be a problem. However, some loose silty sand was found in mudflow deposits in the northern portion of the site. These deposits may be susceptible to dynamic settlement and possibly hydrocompaction.

Landslides may be a problem at the Butte Valley Site in areas where bedrock outcrops are found on slopes up to 25 percent. This should only be considered a viable problem if slopes are altered or undercut.

The surfaces of intermediate age alluvial fan units which cover most of the western portion of the site are incised by drainages and should not be subjected to flooding. The fine-grained younger alluvial unit in the northern portion of the site appears to be of mudflow origin and may be subject to mudflows in the future. Other areas of young alluvial fan deposits may also be susceptible to mudflows. The fine-grained mixed lacustrine and young alluvial deposits in the eastern half of the site will probably be subject to ponding after high intensity rainfall. Ponding of shallow depressions in this area was observed during field work conducted after intense rainstorms.

3.2.1.2 North Steptoe Valley Site

3.2.1.2.1 Physiography

The North Steptoe Valley Site is situated in the northern portion of the valley between the Cherry Creek Range on the west and the Schell Creek Range on the east. The topographic surface at the site slopes from the southeast to the northwest at gradients ranging from three percent, in the southeast, to nearly horizontal in the western and southwestern portions of the site. Site elevations vary from 6030 feet in the extreme southeastern corner of the site to 5850 feet along the western portion of the northern boundary of the site. Shallow, braided stream channels with less than two feet of relief trend northwesterly across the southeastern portion of the site.

3.2.1.2.2 Geology

The western two-thirds of the North Steptoe Valley Site are underlain by fluvial (river), paludal (swamp or marsh), and aeolian (wind) deposits. The fluvial and paludal units are generally fine-grained reflecting deposition in low-energy river or swamp environments. Surface soils consist of sandy clay, sand, and sandy silt that are covered with a white, crystalline evaporite (salt) mineralization. Sand dune deposits overlie these units in the north central and northern portions of the site. The dune areas have local relief of two to five feet which probably reflects their thickness.

Alluvial fan and paludal deposits make up the principal surface units exposed in the eastern one-third of the site. Young sandy alluvial fan deposits occur on top of or mixed with, the fine-grained paludal sediments in this part of the site. Surface soils consist of predominately sandy silt and sand with some gravel. An older alluvial fan unit is exposed in the southeastern portion of the site. Surface soils on this coarse-grained alluvial fan unit consist of moderately to weakly cemented sand and gravelly sand.

3.2.1.2.3 Seismicity

Seismicity is a regional phenomenon and is discussed in a regional context in Section 3.1.1.3.

3.2.1.2.4 Geologic Hazards

A major range-bounding fault located on the western side of Steptoe Valley passes within four miles of the North Steptoe Valley Site (Figure 3-2). This fault is typical of major faults in the Basin and Range Province which have generated earthquakes as large as Magnitude 7-3/4. Recurrence intervals for large earthquakes on this type of fault are estimated to be a few thousand to a few hundred thousand years long. Therefore, the potential for strong ground motion at the North Steptoe Valley Site generated by an earthquake on this nearby fault or other faults in the region is considered to be low.

The North Steptoe Valley Site does not contain any major fault traces. However, there are several north-trending lineaments present in the vicinity of the site (Figure 3-12). One of the two lineaments located within the site boundaries is aligned with a group of similar features along the east side of Steptoe Valley (Figure 3-2). The lineaments do not have any detectable topographic expression and are delineated by alignments of vegetation. Geotechnical investigations conducted in 1982 indicate that these lineaments are not fault-related.

Preliminary geotechnical investigations did not encounter any extensive deposits at the North Steptoe Valley Site which would be susceptible to liquefaction or dynamic settlement. However, several small areas of aeolian sand present at the site may be susceptible to liquefaction or dynamic settlement should they become saturated. (The depth of groundwater beneath some parts of the site is as little as a few feet). Due to the limited thickness of these deposits, this potential problem, as well as the potential for hydrocompaction, can be easily eliminated by removal or compaction of the material.

The fine-grained paludal and fluvial deposits that underlie most of the site are subject to ponding after high-intensity rainfall or high spring runoff. The alluvial fan deposits which underlie the southeastern portion of the site are dissected by well-developed drainages. These drainages should act to channel overland flow and promote infiltration into the relatively coarse-grained deposits.

3.2.1.3 Spring Valley Site

3.2.1.3.1 Physiography

The Spring Valley Site is located in the southwestern portion of Spring Valley, a closed alluvial basin bounded on the east by the Snake Range and on the west by the Schell Creek Range. The topographic surface at the site decreases in elevation from west to east toward the axis of the valley. Elevations along the western boundary of the site range from 5980 to 6030 feet, while along the eastern boundary elevations vary from 5780 to 5810 feet. Average slope gradients range from 2.5 percent to 0.5 percent in the western and eastern portions of the site, respectively.

3.2.1.3.2 Geology

Young and older alluvial fan deposits are the predominant geologic units exposed at the Spring Valley Site. The older alluvial fan unit, present over nearly the entire western half of the site, is characterized by a dissected, sloping surface with a well-developed dendritic drainage system. Surface soils consist of weakly to moderately cemented sand, sandy silt, and gravel. Overlying this unit in the west-central portion of the site is a young alluvial fan deposit that appears to be of mudflow origin. The head of this fan is located west of the site at the mouth of a steep-sided, deep channel that drains an extensive area of the Schell Creek Range. The deposit is characterized by intergranular voids with clay fillings and exhibits the classic lobate form of mudflows with well-defined edges. The deposit is approximately five feet thick at its distal end and may approach 15 feet thick at its head.

The eastern part of the site is characterized by fine-grained deposits of alluvial, lacustrine, and aeolian origin. The predominant surface unit is a mixed young and older alluvial fan deposit. Surface soils consist mainly of weakly cemented silty sand, silt, and sand. A soil boring drilled into this unit shows that this material is probably a relatively thin veneer that overlies much finer-grained deposits that are probably of lacustrine origin. Surface exposures of lacustrine deposits are present only in the southeastern portions of the site but probably underlie most of the eastern half of the site. Small areas of aeolian sand dunes are present in the northeastern portion of the site. These deposits are stabilized with vegetation and are underlain by alluvial deposits at depths of probably no more than ten feet.

3.2.1.3.3 Seismicity

Seismicity is a regional phenomenon and is discussed in a regional context in Section 3.1.1.3.

3.2.1.3.4 Geologic Hazards

The Spring Valley fault zone is the closest major fault zone to the Spring Valley Site (Figure 3-2). Discontinuous surface traces of this fault zone occur within the boundaries of the Spring Valley Site (Figure 3-13). Considering the length of the fault zone (approximately 80 miles), this fault zone may be capable of generating an earthquake greater than Magnitude 7. However, recurrence intervals for large earthquakes on this type of fault are estimated to be a few thousand to several thousand years long. Therefore, the potential for strong ground motion to occur at the site within the next 50 years is low.

Several surface faults and lineaments are present in the central and western portions of the Spring Valley Site

(Figure 3-13). These features are interpreted to be part of the Spring Valley fault zone which extends for a total distance of about 80 miles. Surface fault traces in the site vicinity are discontinuous but these apparent discontinuities are probably related to deposition of a young alluvial unit across portions of the fault zone following the most recent fault movement. Faults scarps in the vicinity of the site reach 20 feet in height, but the actual amount of surface fault displacement cannot be estimated due to scarp modification by groundwater seepage along the fault planes. The numerous lineaments on the site consist mainly of vegetation alignments with no evidence of surface displacements. Although these linear features could be interpreted as the result of nontectonic processes, the similar orientation of these features relative to the fault traces suggests that they are most likely tectonic in origin. Due to the presence of a zone of faults and lineaments across the site, the potential for surface fault rupture is considered low to moderate.

Preliminary geotechnical investigations did not encounter any extensive deposits which would be susceptible to liquefaction or dynamic settlement. However, the depth to groundwater beneath the site varies from about one to six feet, and some local occurrences of soils in the areas of shallow groundwater may be susceptible to liquefaction. In addition, some loose silty sand present in mudflows may be susceptible to dynamic settlement and/or hydrocompaction. Due to the limited thickness of this deposit, removal or compaction of this unit should minimize the potential hazard.

The surfaces of the intermediate age fan units will probably not be susceptible to flooding. These surfaces are highly dissected and the incised drainages should channel flow and promote infiltration into the generally coarse-grained deposits. The fine-grained young alluvial fan in the west-central portion of the site is considered to be prone to mudflows. The eastern portion of the site contains mixed lacustrine, aeolian, and alluvial deposits and may be subject to ponding after high-intensity rainfall.

3.2.2 Air Resources

In order to provide ambient air quality and meteorological data to support the air permit application, an air monitoring plan was submitted to EPA Region IX for approval in October 1981. The plan, which was based on discussions with EPA and on EPA ambient monitoring guidelines, was approved by letter dated December 10, 1981.

The monitoring guidelines specify monitoring of various criteria and noncriteria pollutants based on background concentrations and expected impacts. Monitoring of a given pollutant is not required if certain tests of significant impact are satisfied. A list of significant air quality concentrations for regulated pollutants is included in PSD regulations. If existing air quality or the impact of the proposed source is less than these concentrations, then monitoring will generally not be required.

Monitoring will be required only for those pollutants subject to PSD regulations. Source applicability to PSD regulations is determined by comparing emissions with a list of significant emission rates contained in PSD regulations. The source is exempt from PSD review for any pollutant with emissions less than the significant rate.

After reviewing all applicable pollutants, it was determined that SO_2, PM, nitrogen dioxide (NO_2), lead (Pb), beryllium (Be), and mercury (Hg) should be monitored. Carbon monoxide (CO), ozone (O_3), asbestos, vinyl chloride, fluorides, sulfuric acid mist, total reduced sulfur and reduced sulfur, and hydrogen sulfide would not be monitored either because they would not have significant emission rates or because there were no acceptable monitoring techniques available.

Erection of meteorological and air quality monitoring stations began in November 1981 and was completed in January 1982. A primary station was located on or near each of the three WPPP sites. Secondary stations were also located in mountain passes between Steptoe Valley and Butte Valley (Grass Springs) and between Steptoe Valley and Spring Valley (Connors Pass).

Doppler acoustic radar systems (DARS) for measuring wind speed and horizontal and vertical wind direction sigmas and direction of 30-meter increments from 10 meters to 600 meters and for determining the mixing height were installed at primary stations. A ten-meter tower was also used to measure surface winds and ambient temperature. SO_2, PM, Pb, and Be were monitored at all three primary stations with NO_2 and Hg also being monitored at the North Steptoe Valley Site. Each of the secondary stations included a ten-meter tower to measure surface winds and an SO_2 monitor.

Atmospheric stability at the three WPPP sites was characterized using the standard deviation of vertical wind direction fluctuation (sigma-phi) to estimate the atmospheric stability class. This was in turn estimated from the standard deviation of vertical wind speed (sigma-w) divided by the mean horizontal wind speed according to EPA recommendations.

Monitoring was completed on January 31, 1983, and the stations were dismantled. After reviewing all collected data, a one-year period from February 1, 1982 through January 31, 1983 was selected as the baseline monitoring period. No violations of NAAQS were recorded during the one-year period. Maximum measured concentrations were substantially less than NAAQS.

The following sections include baseline data on air resources of the three WPPP sites. Additional information is included in the Air Resources Baseline technical report.

3.2.2.1 Butte Valley Site

3.2.2.1.1 Meteorology

Temperature data gathered at the monitoring station on the Butte Valley Site indicate that, for the period February 1982 through January 1983, December was the coldest month and August the warmest. The annual average temperature was 45°F, and the average diurnal temperature range was 24°F. Temperature extremes ranged from -8°F in December to 91°F in July.

Wind speed and direction frequencies were determined at four elevations above the ground surface and resulted in the following characteristics of the local wind regime:

- Prevailing winds are generally southerly at all levels. A higher frequency of southwest to south-southwest winds at the ten-meter level is probably caused by topographic features.

- Winds with a westerly component are more frequent than winds with an easterly component, reflecting the prevailing westerlies in the mid-latitudes.

- Mean wind speeds are greater from westerly directions than from easterly directions.

- The mean wind speed increases with height, more than doubling from 7.4 mph at 10 meters to 16.6 mph at 570 meters.

- A diurnal variation in wind speed occurs at the 10-meter and 60-meter levels where afternoon windspeeds almost double the nighttime speeds, particularly after midnight.

The secondary monitoring station at Grass Springs, a mountain pass between Butte Valley and Steptoe Valley, was established to document cross-valley wind and SO_2 exchange. Winds at Grass Springs are generally westerly, indicating that the dominant air exchange in this area is from Butte Valley to Steptoe Valley. The mean overall wind speed is about 8 mph, and wind speeds less than 2.2 mph occur less than 4 percent of the time. Wind speeds are greatest from southerly directions where they average 12 to 13 mph.

At the 210-meter level, unstable conditions (Class A, Class B, and Class C) are most frequent in the daytime, and stable conditions (Class E and Class F) are most frequent at night. Neutral (Class D) conditions occur about 25 percent of the time throughout the day.

At the ten-meter level, unstable conditions are most frequent in the 6 a.m. to noon time period. However, in the afternoon, Class E conditions are dominant at the ten-meter level.

Since vertical motion increases in the afternoon, the afternoon maximum of stable conditions is not representative of a stable vertical temperature structure. Rather, it is indicative of vertical dispersion conditions as a function of downwind distance. Increased wind speeds give less time for dispersion to occur for a given downwind travel distance.

Hourly mixing heights for the Butte Valley Site also were determined from DARS data. Mixing heights were greater than the DARS 600-meter limit approximately 69 percent of the time. Mixing height data for Ely should be considered representative of conditions in Butte Valley.

3.2.2.1.2 Air Quality

Pollutants measured at the Butte Valley Site include SO_2, PM, Pb, and Be. Maximum measured concentrations were substantially less than NAAQS.

SO_2 concentrations were caused primarily by emissions from the McGill smelter. The low measured concentrations indicate that relatively little air is transported from the McGill smelter to the Butte Valley Site. PM concentrations were most likely caused by wind-blown dust during high wind speed conditions.

SO_2 was the only pollutant measured at the Grass Springs station. Measured concentrations were substantially less than NAAQS. The Grass Springs area, which is located in the SO_2 nonattainment area (Figure 3-3), was in attainment for SO_2 during the period from February 1982 through January 1983.

3.2.2.2 North Steptoe Valley Site

3.2.2.2.1 Meteorology

Temperature data gathered at the monitoring station on the North Steptoe Valley indicate that, for the period

February 1982 through January 1983, December was the coldest month and August the warmest month. The annual average temperature was 47°F, and the average diurnal temperature range was 22°F. Temperature extremes ranged from -11°F in February to 94°F in July.

Wind speed and direction frequencies were determined at four elevations above the ground surface and resulted in the following characteristics of the local wind regime:

- Prevailing winds are generally south-southeasterly at all levels, corresponding to the general orientation of Steptoe Valley in the vicinity of the site.

- Winds with a westerly component are more frequent than winds with an easterly component, reflecting the prevailing westerlies in the mid-latitudes.

- Mean wind speeds are greater from westerly directions than from easterly directions.

- The mean wind speed increases with height, from 8 mph at 10 meters to 13 mph at 570 meters.

- The percentage of calm winds (that is, less than 2.2 mph) decreases with height from 10.1 percent at 10 meters to 1.8 percent at 570 meters.

- A strong diurnal variation in wind speed occurs at the 10-meter and 60-meter levels. Afternoon speeds at 10 meters are approximately 70 percent greater than the nighttime speeds particularly after midnight.

At the 210-meter level, unstable conditions (Class A, Class B, and Class C) are most frequent in the daytime, and stable conditions (Class E and Class F) are most frequent at night. Neutral (Class D) conditions occur an average of 19 percent of the time throughout the day.

At the ten-meter level, the pattern of unstable daytime conditions and stable nighttime conditions is also evident. The dominance of Class E conditions in the afternoon at the Butte Valley Site is not found at the North Steptoe Valley Site.

Hourly mixing heights at the North Steptoe Valley Site also were determined from DARS data. Mixing heights were greater than the DARS 600-meter limit approximately 77 percent of the time. Mixing height data for Ely should be considered representative of conditions in North Steptoe Valley.

3.2.2.2.2 Air Quality

Pollutants measured at the North Steptoe Valley Site include SO_2, PM, NO_2, Pb, Be, and Hg. Maximum measured concentrations were substantially less than NAAQS.

SO_2 concentrations were caused primarily by emissions from the McGill smelter. The measured concentrations indicate that the SO_2 attainment designation for this area is appropriate. PM concentrations were most likely caused by wind blown dust during high wind speed conditions and from PM emissions at the smelter.

Because there are no significant sources of NO_x in the County, annual average NO_2 concentrations measured at the North Steptoe Valley Site were virtually nonexistent.

3.2.2.3 Spring Valley Site

3.2.2.3.1 Meteorology

Temperature data gathered at the monitoring station on the Spring Valley Site indicate that, for the period February 1982 through January 1983, December was the coldest month and July and August were the warmest months. The average diurnal temperature range was 26°F, and the average annual temperature was 45°F. Temperature extremes ranged from -13°F in February to 93°F in July.

Wind speed and direction frequencies were determined at four elevations above the ground surface and resulted in the following characteristics of local wind regime:

- Prevailing winds are generally southerly at all levels. This and a secondary maximum of northerly winds reflect the orientation of Spring Valley in the vicinity of the site.

- Winds with a westerly component are more frequent than winds with an easterly component, reflecting the prevailing westerlies in the mid-latitudes.

- Mean wind speeds from the southeast are much greater at the 570-meter level than at lower levels.

- The mean wind speed increases with height, more than doubling from 7.4 mph at 10 meters to 15.9 mph at 570 meters.

- The percentage of calm winds (that is, less than 2.2 mph) decreases with height from 11.1 percent at 10 meters to 1.5 percent at 570 meters.

- o A strong diurnal pattern in wind speed at the 10-meter and 60-meter levels occurs at this site. Afternoon speeds at 10 meters are approximately 70 percent greater than the nighttime speeds, particularly after midnight. At the 570-meter level, wind speeds are highest in the final quarter of the day.

The secondary monitoring station at Connors Pass, a mountain pass between Spring Valley and Steptoe Valley, was established to document cross-valley wind and SO_2 exchange. Winds at Connors Pass are generally westerly, indicating that the dominant air exchange in this area moves from Steptoe Valley to Spring Valley. Wind speeds are greatest from westerly directions where they average 11 to 12 mph. The mean overall wind speed is about 10 mph, and wind speeds less than 2.2 mph occur less than one percent of the time.

At the 210-meter level, unstable conditions (Class A, Class B, and Class C) and neutral conditions (Class D) are most frequent in the daytime, and stable conditions (Class E and Class F) are most frequent at night.

At the ten-meter level, unstable conditions are most frequent in the 6 a.m. to noon time period. However, in the afternoon Class E conditions are dominant at the ten-meter level.

Hourly mixing heights at the Spring Valley Site were also determined from DARS data. Mixing heights were greater than the DARS 600-meter limit approximately 81 percent of the time. Mixing height data for Ely should be considered representative of conditions in Spring Valley.

3.2.2.3.2 Air Quality

Pollutants measured at the Spring Valley Site include SO_2, PM, Pb, and Be. Maximum measured concentrations were substantially less than NAAQS.

SO_2 concentrations were caused primarily by emissions from the McGill smelter. The low measured concentrations indicate that relatively little air is transported from McGill to the Spring Valley Site. PM concentrations were most likely caused by wind blown dust during high wind speed conditions.

SO_2 was the only pollutant measured at the Connors Pass station. Measured concentrations were substantially less than NAAQS.

3.2.3 Water Resources

The following sections include baseline data on water resources of the three WPPP sites. Additional information is included in the Water Resources Baseline technical report.

3.2.3.1 Butte Valley Site

Available information on the site-specific geology and groundwater occurrence in Butte Valley is limited. Logs for three wells drilled within the valley fill materials suggest that the subsurface characteristics vary significantly depending on the proximity to either the central playa or the perimeter edges of the valley. The valley itself contains approximately 1000 feet of unconsolidated sediments. During the Pleistocene, a lake occupied the valley resulting in the deposition of a thick sequence of lacustrine deposits.

These fine-grained deposits may be underlain by unconsolidated Tertiary units. Alluvial and colluvial sand and gravel are found along the valley sides. These sands and gravels appear to have been deposited contemporaneously with the lacustrine deposits resulting in interfingering of the coarse and finer materials. Alluvial aprons exist along most of the valley edges and are the principal sources of groundwater within the valley. Their high permeabilities yield moderate to large amounts of water to wells.

The mountains forming the Butte Valley drainage basin consist mainly of Paleozoic carbonate rocks and some Tertiary volcanics. The east side of the valley consists primarily of limestone, with smaller amounts of dolomite, shale, and quartzite. A few remnants of Tertiary volcanics are also present and are predominant in the southern part of the basin. Limestone of Paleozoic age, with smaller amounts of dolomite and carbonaceous shale and sandstone, is found mainly in the western portion of the valley. The carbonate rocks on the sides of the valley are generally more permeable than the volcanics and quartzites. This is due to the presence of solution cavities and jointing.

Butte Valley is a closed groundwater basin. Precipitation is the sole source of recharge within the 730-square-mile drainage basin. The mean annual recharge is estimated by the USGS and NDCNR to be on the order of 15,000 afy. The mean annual discharge and perennial yield for the basin are estimated to be 12,000 afy and 14,000 afy, respectively. Current groundwater appropriations total about 1600 afy, leaving approximately 12,000 afy available for development. The volume of water in storage in the upper 100 feet of the saturated section is estimated to be 1.5 million acre-feet. Only one known thermal spring is present in the valley.

3.2.3.2 North Steptoe Valley Site

Steptoe Valley includes a drainage area of approximately 1975 square miles. The valley is elongated in a north-south direction and extends from the southern boundary of the County into Elko County to the north.

The bedrock geology of the mountains surrounding Steptoe Valley can be divided into four main units based on their hydrogeologic characteristics.

The first unit is Upper Precambrian to Lower Cambrian and consists of quartzose sedimentary rocks. Weathered and fractured zones, where they occur within a few hundred feet of the land surface, transmit groundwater and are potentially capable of providing limited water supplies. These rocks supply much of the late-season flow to tributaries of Duck Creek, one of the few perennial streams within Steptoe Valley.

The second hydrogeological unit consists of Paleozoic carbonates which include some elastic and other undifferentiated rocks. The carbonate rocks supply water to most of the larger springs in Steptoe Valley. The carbonates are fractured and contain solution cavities.

The other two hydrogeological units are relatively impermeable and consist of Cretaceous and Tertiary intrusive granitic rocks and Mesozoic and Tertiary volcanics with some consolidated sedimentary deposits. These hydrogeologic units stratigraphically overlie the Paleozoic carbonate unit. Locally, the volcanics may yield small amounts of water to springs.

The unconsolidated deposits are at least 4000 feet thick in the northern end of Steptoe Valley and up to 10,000 feet thick in the central and southern portions. The older valley fill deposits consist of unconsolidated to poorly-consolidated silt, sand, and gravel of moderate to low permeability, except near the sides of the valley where the alluvial aprons are of relatively high permeability. The more recent valley fill materials consist of silt, sand, and gravel along the valley floor and flood plain segments of tributary channels. In the northern end of Steptoe Valley where the lowland broadens, the younger fill may also contain lacustrine silt and clay.

Steptoe Valley is essentially a closed groundwater basin and, therefore, precipitation is the sole source of groundwater recharge. Steptoe Valley, however, is located within the recharge area for the eastern Nevada regional carbonate aquifer. The USGS has estimated the mean annual groundwater recharge and discharge to be approximately 85,000 afy and 70,000 afy, respectively.

Springs are numerous on both sides of the valley and originate from carbonate and volcanic rocks, as well as gravity springs within the alluvium. Thirteen known thermal springs occur within the valley. The springs originating in the mountains are the source of many of the intermittent streams. The flow from many of the streams originating in the mountains, however, reaches the valley floor only during periods of snowmelt and following periods of heavy rainfall. Duck Creek and Steptoe Creek are two of the few perennial streams within the valley. The combined discharge from these two streams represents about half of the estimated 78,000 afy of runoff from the mountains.

In the central portion of the valley, the water table is at, or close to, the ground surface throughout much of the year. This area supports wetland vegetation and is the principal area of groundwater discharge. A few small lakes and dry lakebeds are found along the central axis of the valley.

Existing groundwater development in Steptoe Valley is concentrated in three areas: 1) south of Ely to Comins Lake; 2) between McGill and Monte Neva Hot Springs; and 3) in the northern part of the valley near the Elko County/White Pine County line.

In the area south of Ely to Comins Lake, the valley is narrow with numerous streams forming small alluvial fans on the valley floor. No lacustrine deposits are known to exist within the southern portion of Steptoe Valley.

The area between McGill and Monte Neva Hot Springs is dominated by extensive deposits of the Duck Creek alluvial fan, which extends into the valley from Gallagher Gap. Well logs from this area indicate that the upper 200 feet of sediments in the fan area consist mainly of sand and gravel. (In the central parts of the valley, the sediments consist mainly of silts and clays.) A number of high-production irrigation wells are located within the area between Ely and McGill. The wells in this area are typically 125 to 250 feet deep with reported yields in excess of 2000 gpm.

North of McGill, well yields tend to decrease with the depth of wells and resultant drawdowns due to pumping increases. Well depths north of McGill typically range from 400 to 500 feet or deeper, with yields from individual wells between 600 gpm and 750 gpm.

In the northern part of the valley near the County line, numerous wells are concentrated within a five-square-mile area near the east side of the valley. Most of the wells in this area are 200 to 400 feet deep, with a few reported to be as deep as 900 feet.

Available groundwater quality data for Steptoe Valley indicate high levels of sulfate. These analyses, however, are for samples mostly taken from springs and may not be typical of the groundwater quality within the valley fill. It is anticipated that the groundwater quality within the valley fill materials varies, depending on location, from fresh with low concentrations of dissolved solids to brackish in areas of groundwater discharge.

Calculated transmissivities for existing wells completed within the alluvium in Steptoe Valley range from about 400 gallons per day per foot (gpd/ft) to 160,000 gpd/ft. Reported yields from individual wells range from about 100 gpm to 1500 gpm.

Current groundwater withdrawals are estimated to be approximately 32,000 afy. Major uses include irrigation (19,500 afy), mining and energy development (9600 afy), and urban/industrial use (2900 afy). The estimated consumptive use, which includes evapotranspirational losses from irrigated and non-irrigated lands, is 84,500 afy.

3.2.3.3 Spring Valley Site

Spring Valley is essentially a closed groundwater basin and includes a drainage area of approximately 1700 square miles in the eastern part of the County. The valley also overlies the eastern Nevada carbonate aquifer. The valley is bounded on the west by the Schell Creek Range and by the Snake Range on the east. The Schell Creek Range consists of predominantly Paleozoic limestone and dolomite with isolated remnants of Tertiary lava flows common. The carbonates contain solution cavities and are jointed which contribute to groundwater movement. The Snake Range consists primarily of Precambrian quartzite with some granodiorite stocks occurring in different locations. Both the quartzite and granodiorite are relatively impervious.

The depth of the unconsolidated alluvial, colluvial, and lacustrine materials which comprise the valley fill in Spring Valley is unknown, but is likely to be in excess of 1000 feet. In the geologic past, Spring Valley contained a large lake. Clay and other fine-grained sediments which were deposited in the lake can be found at a considerable depth below the present valley floor. The fine lacustrine deposits in Spring Valley are as much as 300 feet thick and are underlain by poorly-consolidated Tertiary and Quaternary sand, silt, and gravel which comprise a potentially good aquifer.

Several small streams occur in the southern half of Spring Valley. These streams have their origin in the mountains and are fed by springs and direct surface runoff during snowmelt and periods of heavy rainfall. The largest perennial stream in Spring Valley is Cleve Creek, located in the northern part of Spring Valley. The mean annual discharge of Cleve Creek is estimated to be approximately 6350 afy. Some thermal springs occur in Spring Valley, but none are classified as hot springs. The Shoshone Ponds in the southern portion of Spring Valley support important threatened and endangered species and, therefore, are a sensitive area.

Both confined and unconfined conditions exist within the valley. Several flowing wells occur within the area to the east of Baking Powder Flat in the southern part of the valley and at least one flowing well in the northern part of the valley.

The depth to the groundwater table within the valley floor varies from less than 10 feet to 100 feet or more. Much of the valley floor areas consist of playas. The USGS and NDCNR have estimated both groundwater recharge and discharge to be approximately 75,000 afy. The estimated mean annual discharge includes approximately 4000 afy and flows from Spring Valley to Hamlin Valley. The perennial yield of the basin is estimated to be approximately 100,000 afy. This includes an estimated mean annual runoff from the mountains of 90,000 afy and an estimated 10,000 afy of direct precipitation on the alluvial fans. The apparent difference between the estimated mean annual recharge and the perennial yield includes some 25,000 acre-feet of rejected recharge that flows onto the playas and evaporates. Calculated transmissivities for existing wells range from about 3500 gpd/ft to 16,900 gpd/ft. Well yields range from about 400 gpm to 525 gpm.

Existing groundwater development in Spring Valley is concentrated around the periphery of the valley, particularly along the east side of the valley south of U.S. Highway 6 and along the west side of the valley north of U.S. Highway 6. The wells in both areas typically range in depth from 300 to 500 feet, although a few wells may exceed 900 feet. The majority of wells yield 450 gpm to 500 gpm. Only a few wells are located within the central portion of the valley.

Estimated groundwater withdrawals are approximately 18,500 afy, and the major uses include irrigation (16,500 afy) and mining and energy development (1700 afy).

3.2.4 Ecological Resources

The following sections include baseline data on ecological resources of the three WPPP sites and associated corridors. Additional information is included in the Ecological Resources Baseline technical report and in the Biological Assessment technical report.

3.2.4.1 Butte Valley Site

3.2.4.1.1 Soils

Soils of the Butte Valley Site occur on gentle, northeast trending slopes at elevations between 6200 and 6500 feet. The six soil mapping units that occur on the Butte Valley Site are shown on Figure 3-14. Information on soils associated with these mapping units is included in Table 3-17.

3.2.4.1.2 Vegetation

The vegetation of the Butte Valley Site consists primarily of black sagebrush, Wyoming big sagebrush, winterfat, and shadscale-dominated communities with pinyon and juniper on hillsides.

Information on ecological sites is included in Table 3-17. The five ecological sites (and their associated plant species) on the Butte Valley Site are as follows:

a. Loamy 5-8 (shadscale)
b. Shallow Calcareous Loam 8-12 (black sagebrush)
c. Silty 8-10 (winterfat)
d. Loamy 8-10 (Wyoming big sagebrush)
e. Shallow Loamy Slope 12-16 (pinyon-juniper)

Each ecological site has a diagnostic potential plant community and species composition which is an expression of all the environmental factors. However, due to disturbance (primarily heavy grazing), only a few of the potentially dominant species are present in the existing plant communities. Therefore, existing vegetative composition may only marginally resemble the potential of an ecological site.

Loamy 8-10 occurs predominantly on terraces, fans, flats and slopes between about 5000 and 7000 feet in elevation, and covers about 43 percent of the Butte Valley Site. Annual plant production is estimated to range from 400 to 800 pounds per acre with a median value of 600 pounds per acre in an average year. The existing vegetation is composed primarily of big sagebrush, with lesser amounts of bud sagebrush and shadscale. Sandberg bluegrass, bottlebrush squirreltail, Indian ricegrass, and pinnate tansy mustard are interspersed among the shrubs.

About 26 percent of the entire Butte Valley Site is mapped as Shallow Calcareous Loam 8-12 and is represented by a black sagebrush community, mainly on well-drained knolls, with Wyoming big sagebrush, low rabbitbrush and scattered plants of Green rabbitbrush, bud sagebrush, halogeton, wallflower, winterfat, and pinnate tansy mustard as the main associates. Annual production ranges from 400 pounds per acre in a dry year to 950 pounds per acre in a moist year. Average production is estimated at 700 pounds per acre.

Silty 8-10 occupies flats, basins, and level fans and comprises about seven percent of the Butte Valley Site. Silty 8-10 contains primarily winterfat-dominated communities with only shadscale, halogeton, and pinnate tansy mustard as associates. Annual production is estimated at 550 pounds per acre in a median year, but can range from 300 to 800 pounds per acre depending upon climatic conditions.

Loamy 5-8 occurs on lower valley fans and terraces on about 16 percent of the Butte Valley Site. A shadscale community dominates, but bud sagebrush, Wyoming big sagebrush, and winterfat communities are also present. Less abundant species include Sandberg bluegrass, bottlebrush squirreltail, Indian ricegrass, and pinnate tansy mustard. Production is estimated to range from 600 pounds per acre to 250 pounds per acre with a value of 450 pounds per acre for normal years.

The remaining 8 percent of the Butte Valley Site is represented by Shallow Loamy Slope 12-16. This ecological site is dominated by strands of pinyon-juniper woodland, and occurs on slopes betweeen 6500 and 8500 feet elevation. The shrub understory is usually black sagebrush but varies considerably in composition, depending upon aspect, slope, elevation, and soil conditions.

3.2.4.1.3 Terrestrial Wildlife

No big game species are known to consistently use shrub-steppe habitats on the Butte Valley Site. However, the site is within an area under consideration for pronghorn introduction. Additionally, mule deer winter range occurs on adjacent benches, and bands of wild horses frequent the area. Though sage grouse are found, no leks or wintering areas have been located on the site. A ferruginous hawk nest is present in the southwest corner of the site, and one wintering bald eagle was known to use the portion of Butte Valley within the County.

3.2.4.1.4 Aquatic Ecology

No aquatic species or potential aquatic habitat are known to occur on, or immediately adjacent to, the Butte Valley Site.

3.2.4.1.5 Wetlands

There are no wetland areas in Butte Valley.

3.2.4.2 North Steptoe Valley Site

3.2.4.2.1 Soils

Soils of the North Steptoe Valley Site occur on a gently sloping valley at elevations between 5900 and 6000 feet. The five soil mapping units that occur on the North Steptoe Valley Site are shown on Figure 3-15. Information on soils associated with these mapping units is included in Table 3-17.

3.2.4.2.2 Vegetation

Big sagebrush and black greasewood-dominated communities characterize most of the vegetation of the North Steptoe Valley Site, with shadscale and saline meadows occurring as minor constituents. A transition of upland to lowland vegetation occurs from east to west on the site. This transition in vegetation follows a gradient of increased salinity and poor soil drainage.

Information on ecological sites is included in Table 3-17. The seven ecological sites (and their associated plant species) on the North Steptoe Valley Site are as follows:

a. Sodic Terrace 6-8 (greasewood/shadscale)
b. Sodic Terrace 8-10 (greasewood/big sagebrush)
c. Loamy 5-8 (shadscale)
d. Loamy 8-10 (Wyoming big sagebrush)
e. Saline Bottom 5-12 (alkali sacaton, inland saltgrass, basin wildrye)

f. Saline Meadow 5-12 (alkali sacaton)

g. Sodic Flat 5-12 (greasewood)

Sodic Terrace 6-8 and Sodic Terrace 8-10 are the most abundant, occurring on about 42 percent of the North Steptoe Valley Site. Black greasewood is characteristic, along with rubber rabbitbrush and shadscale. Low rabbitbrush, cheatgrass brome, alkali cordgrass, and claspingleaf pepperweed are the major understory species. Depending on growing conditions, annual production ranges from 300 to 600 pounds per acre for Sodic Terrace 6-8 and 350 to 800 pounds per acre for Sodic Terrace 8-10. Soils are saline and may have a water table near the surface.

Wyoming big sagebrush is the potentially dominant species of Loamy 8-10, but occurs on only about two percent of the North Steptoe Valley Site. Conversely, existing vegetation contains a high percentage of greasewood and low rabbitbrush. Less abundant species of both the shrub and herbaceous strata are black sagebrush, gooseberry-leaf mallow, milkvetch, and claspingleaf pepperweed.

Shadscale dominates Loamy 5-8, which covers about 13 percent of the North Steptoe Valley Site. Winterfat should be associated with shadscale on Loamy 5-8, but grazing has substantially reduced its occurrence. Instead, halogeton, bottlebrush squirreltail, and claspingleaf pepperweed are the primary associates. Annual production ranges from 250 to 700 pounds per acre with a median value of 450 pounds per acre.

Sodic Flat 5-12, Saline Meadow 5-12, and Saline Bottom 5-12 are associated with poorly drained, sodic soils and are mapped as one unit. Sodic Flat 5-12 is associated with black greasewood communities on slightly elevated and better drained areas and include alkali sacaton and inland saltgrass. Associates of black greasewood in the existing communities include littleleaf horsebrush, rubber rabbitbrush, gray molly, bud sagebrush, shadscale, and Green rabbitbrush. Basin wildrye, claspingleaf pepperweed, and thelypody are scattered under protective shrubs. Annual production ranges from 200 to 600 pounds per acre. Saline Meadow 5-12 is primarily represented by alkali sacaton, alkali cordgrass, and inland saltgrass. Other grass-like species (e.g., sedges and bulrushes) are differentially important. Black greasewood, fourwing saltbush, and rubber rabbitbrush are scattered throughout the community. Annual production ranges from 700 to 3000 pounds per acre. Saline Bottom 5-12 is closely associated with Saline Meadow 5-12 but is generally less productive (500 to 2000 pounds per acre). Saline Bottom 5-12 and Saline Meadow 5-12 also encompass marshes and shallow alkaline wetlands that support cattails, rushes, alkali grasses, and saltgrass. These areas are classified as palustrine emergent wetlands composed of inland saline flats.

3.2.4.2.3 Terrestrial Wildlife

Areas on, and adjacent to, the North Steptoe Valley Site are inhabited by pronghorn and mule deer. Winter range for both species exists on the benches southeast and west of the site. Wild horses also occur in Steptoe Valley and may frequent the site. During the winter of 1981-1982 bald eagles were observed in Steptoe Valley. In addition, one Peregrine falcon was observed in Goshute Canyon west of the site in 1980.

3.2.4.2.4 Aquatic Ecology

No aquatic species or potential habitat are known to exist on, or immediately adjacent to, the North Steptoe Valley Site. However, Goshute Creek, which is inhabited by a population of relatively pure strain Bonneville (Utah) cut-throat trout, is located approximately five miles northwest of the site.

3.2.4.2.5 Wetlands

There are approximately 15,000 acres of wetlands in parts of Steptoe Valley associated with the North Steptoe Valley Site. These wetlands exist primarily due to stream flows in Steptoe Creek, near-surface water movement along the drainage of Steptoe Creek, and excess flows from privately irrigated farm lands. Some spring discharges occur on the west side of Steptoe Valley from the Egan Range and Cherry Creek Range which contribute surface flows to wetlands. Wetland areas in the northern part of Steptoe Valley tend to be intermittent and vary with the change in volume of stream flows of Steptoe Creek, thereby resulting in a change in species composition.

3.2.4.3 Spring Valley Site

3.2.4.3.1 Soils

Soils of the Spring Valley Site occur on a gently sloping valley at elevations between 5800 and 6000 feet. The six soil mapping units that occur on the Spring Valley Site are shown on Figure 3-16. Information on soils associated with these mapping units is included in Table 3-17.

3.2.4.3.2 Vegetation

Much of the vegetation on the Spring Valley Site consists of big sagebrush, black greasewood, and rubber rabbitbrush.

Information on ecological sites is included in Table 3-17. The six ecological sites (and their associated plant species) on the Spring Valley Site are as follows:

a. Loamy 8-10 (Wyoming big sagebrush)
b. Loamy 5-8 (shadscale)
c. Shallow Calcareous Loam 8-12 (black sagebrush)
d. Silty 8-10 (winterfat)
e. Sodic Terrace 8-10 (greasewood/big sagebrush)
f. Saline Bottom 5-12 (alkali sacaton)

Loamy 8-10 supports a Wyoming big sagebrush/Indian ricegrass community and also contains bottlebrush squirrel-tail, black sagebrush, and winterfat. Loamy 8-10 is characteristic of terraces, flats, benches, and toe slopes at elevations of 5000 to 7000 feet. Annual production ranges from 400 to 800 pounds per acre with a median value of 600 pounds per acre.

Shadscale is prominent on Loamy 5-8 which, characteristically, includes a higher soil salinity. Subordinate species are Sandberg bluegrass, Indian ricegrass, needle-and-thread, pinnate tansy mustard, and claspingleaf pepperweed. Loamy 5-8 occurs on the same topographic features as does Loamy 8-10 but at lower elevations. Median production of the Loamy 5-8 is 450 pounds per acre.

Shallow Calcareous Loam 8-12 is associated with a black sagebrush community, which includes low rabbitbrush, Green rabbitbrush, rubber rabbitbrush, and scattered occurrences of Indian ricegrass. Shallow Calcareous Loam 8-12 occurs on benches, terraces, and slopes at an elevation of 5000 to 7000 feet and produces 700 pounds per acre in a median year.

Winterfat is associated with Silty 8-10. Halogeton is a prominent associate of the winterfat community in Spring Valley. Silty 8-10 occurs on flats, basins, and fans. Median production is approximately 550 pounds per acre.

Sodic Terrace 8-10 is associated with flats, gentle inclines, and basins which lie just above playas and valley bottoms at elevations of 4500 to 7000 feet. Vegetative cover is relatively diverse and is composed primarily of greasewood, big sagebrush, and rabbitbrush. Annual production is estimated to be 350 to 800 pounds per acre with a median value of 600 pounds per acre. Portions of Sodic Terrace 8-10 have been seeded to crested wheatgrass, Siberian wheatgrass, and Russian wildrye.

Saline Bottom 5-12 occurs in low-lying areas which are occasionally flooded or have water levels near the surface. Although typically alkaline, productivity is relatively high at 500 to 2000 pounds per acre, with a median of 1000 pounds per acre. Alkali sacaton and rabbitbrush are dominant species and are accompanied by inland saltgrass, alkali muhly, and alkali cordgrass.

3.2.4.3.3 Terrestrial Wildlife

The Spring Valley Site is within a year-round range for pronghorn. Winter and spring range for mule deer occurs northwest of the site on the east slope of the Schell Creek Range. Several wetland areas exist north and south of the site. Bald eagles were observed in Spring Valley during the winter of 1981-1982.

3.2.4.3.4 Aquatic Ecology

No aquatic species or potential habitat are known to occur on or immediately adjacent to the Spring Valley

Site. However, Pine Ridge Creek, which is inhabited by Bonneville (Utah) cutthroat trout, is located approximately five miles east of the site and the Shoshone Ponds, which are inhabited by the Pahrump killifish, are located approximately six miles southeast of the site.

3.2.4.3.5 Wetlands

There are approximately 8300 acres of wetland areas in the parts of Spring Valley associated with the Spring Valley Site. Wetland areas in Spring Valley are associated with spring discharges and excess flows from privately irrigated farm lands.

3.2.4.4 Transmission Line Corridors

3.2.4.4.1 Soils

Transmission line corridors traverse 22 soil mapping units in the County. The 22 units can be grouped into six broad categories related to land use and reclamation properties.

Group 1 soils are deep, well-drained, moderately permeable soils associated with Loamy 8-10 and occur on alluvial fans. Group 2 soils are all shallow with moderately rapid permeability and good drainage. Also found on alluvial fans, they are associated with Shallow Calcareous Loam 8-12. Group 3 soils are deep, slow to moderately-slow draining, and are found on basin-filled plains in association with Silty 8-10 and Loamy 8-10. Group 4 are deep, well-drained soils with moderately slow permeability. They are found on basin-filled plains and are associated with Sodic Terrace 6-8 and Sodic Terrace 8-11. Group 5 contains soils associated with Saline Meadow 5-12 and Saline Bottom 5-12. The soils are poorly to well-drained, have moderately slow permeability, and are found on basin-filled plains. Group 6 contains soils which are associated primarily with foothills and low mountains. They are well-drained, have moderate to moderately-rapid permeability, and are associated with Shallow Loamy Slope 12-16.

3.2.4.4.2 Vegetation

The transmission line corridors primarily cross northern desert shrub and salt desert transitional shrub vegetation complexes. The northern desert complex contains big sagebrush and black sagebrush, while the salt desert complex contains shadscale, black greasewood, and winterfat communities. Exceptions include corridor segments in Steptoe Valley which cross about five miles of saline meadows. Where corridors extend above about 6800 feet, pinyon-juniper woodland is encountered, along with areas of basin big sagebrush.

South of the County, corridors continue to cross the big sagebrush complex, although salt desert shrub communities of shadscale and black greasewood occur in valleys below about 5500 feet. Creosote bush communities of the Mojave Desert become increasingly more prominent south of the Lincoln County/Clark County line, but interface with shadscale and blackbrush communities at the higher elevations (5300 feet). Range ratany, bursage, brittlebush, and spiny hopsage combine with creosote bush to form several plant communities. Summer and winter flowering annuals also characterize this hot desert vegetation which is crossed by 35 miles of corridor segments.

3.2.4.4.3 Terrestrial Wildlife

Shrub-steppe and pinyon-juniper habitats occurring along the transmission line corridors provide winter habitat for mule deer and wild horses. The coniferous forest habitat characteristic of higher elevation passes is inhabited during the summer by mule deer and elk.

Three sage grouse leks occur in Jakes Valley south of the Butte Valley Site, while another lek occurs west of Gonder Substation. The northerly corridor segment between the Butte Valley Site and Newark Valley includes three ferruginous hawk nest sites and two sage grouse leks and crosses mule deer summer and winter range in the Butte Mountains. Continuing west and entering Eureka County, the corridor passes through the Diamond Range which is predominantly pinyon-juniper woodlands and sagebrush shrubland. This mixed coniferous forest provides seasonal habitat for mule deer and winter sage grouse. In addition, four sage grouse brooding areas and a mule deer migration corridor occur within the corridor in the Diamond Range.

Corridors in northern Steptoe Valley, cross pronghorn winter range and mule deer winter and spring ranges, while sage grouse leks and pronghorn year-round range are included in the Spring Valley corridors. One sage grouse lek and two ferruginous hawk nests, and critical elk habitat (Cooper Canyon) occur within corridors in southern Steptoe Valley.

Mule deer winter range also occurs within the corridors which cross year-round mule deer range and a mule deer migration route. Further south, in Lincoln County, pronghorn antelope year-round range and bighorn sheep range are crossed by corridors, while in Nye County, a corridor segment passes adjacent to a ferruginous hawk nest.

3.2.4.4.4 Aquatic Ecology

The majority of the transmission line corridors cross arid areas without aquatic habitat. Exceptions include Steptoe Creek in Steptoe Valley, Pinto Creek in the Diamond Range, and springs near Preston and Lund in White River Valley. The corridor southeast of Ely is adjacent to Steptoe Creek, which is inhabited by brown trout, rainbow trout, cutthroat trout, and relict dace. Pinto Creek, which is inhabited by rainbow trout, is crossed by a corridor segment extending westerly toward Eureka County.

Corridors in the southern part of the County are adjacent to isolated springs and ponds which provide habitat for endemic fish species in the White River Valley. These fish species include the White River speckled dace, Preston White River springfish, White River spinedace, and White River desert sucker.

3.2.4.4.5 Threatened and Endangered Species

Listed and candidate threatened and endangered species that occur in or near the transmission line corridors are shown on Figure 3-17.

3.2.4.5 Well Fields and Pipeline Corridors

3.2.4.5.1 Soils

Soil properties associated with the well fields and pipeline corridors are similar to those discussed in Section 3.2.4.4.1.

3.2.4.5.2 Vegetation

The well fields and water pipeline corridors are located primarily in Wyoming big sagebrush, black sagebrush, and shadscale-dominated communities. Important associates of big sagebrush communities are rubber rabbitbrush, low rabbitbrush, bud sagebrush, prickly pear, and Indian ricegrass. Black sagebrush communities occur on upland benches (6200 feet) and include low rabbitbrush, bud sagebrush, Wyoming big sagebrush, and winterfat. Shadscale communities, in association with winterfat and black greasewood, occur where well fields are located on upland benches (6200 feet). Saline meadow vegetation occurs on several of the well fields located in Steptoe Valley. Well fields on the east side of Spring Valley include "swamp cedar" stands.

3.2.4.5.3 Terrestrial Wildlife

Sage grouse leks occur south of the Butte Valley well fields and west of the Butte Valley Site. The well field northwest of the site is within sage grouse winter range and ferruginous hawk nests.

Mule deer winter range is present on the well fields to the west of the North Steptoe Valley Site, while pronghorn winter range is present on the well fields immediately east and south of the site. A ferruginous hawk nest exists on the well field area immediately east of the site.

Spring Valley well fields encompass mostly shrub-steppe (year-round pronghorn habitat) and intermittently border on pinyon-juniper woodlands. The well field immediately northeast of the Spring Valley Site is within sage grouse winter range while mule deer winter range occurs on the southeast benches of the Schell Creek Range near the well fields.

3.2.4.5.4 Aquatic Ecology

No aquatic habitat exists on or near the well fields located in Butte Valley. However, aquatic habitat does occur near a portion of a well field in Steptoe Valley. The aquatic habitat consists of the Cordano Ranch Springs (located approximately six miles northeast of the well field), and Warm Springs (railroad station) near Monte Neva Hot Springs (located approximately ten miles south of the well field). Both of these spring complexes are on private land and provide habitat for relict dace. The pipeline corridor connecting the Steptoe Valley well field with the Butte Valley Site parallels Egan Creek, which supports approximately 2.8 miles of habitat for rainbow trout. Egan Creek has recently been considered a viable stream for transplanting Bonneville (Utah) cutthroat trout from the self-sustaining Goshute Creek population.

Small streams and numerous springs occur on or adjacent to Steptoe Valley well fields and pipeline corridors. The northern Steptoe Valley streams include Cherry Creek and Big Indian Creek (West Schell Bench). Fish species of Cherry Creek primarily consist of rainbow trout, while Big Indian Creek is inhabited by both brook trout and rainbow trout. Springs adjacent to the pipeline corridors include Cordano Ranch Springs and Warm Springs (railroad station) which are inhabited by relict dace. Relict dace habitat is present in numerous springs along the eastern base of the Cherry Creek Range.

Major aquatic habitats in the vicinity of the Spring Valley well fields include three stream fisheries (Bastian Creek, Willard Creek, and Pine-Ridge Creek) and Shoshone Ponds. Bastian Creek originates at 6800 feet on the eastern edge of the Schell Creek Range and flows approximately two miles before entering the Spring Valley well fields. Bastian is inhabited by rainbow trout and brown trout. Willard Creek, inhabited by cutthroat trout and rainbow trout, begins its four mile descent into eastern Spring Valley from approximately 7000 feet on the western slopes of the Snake Range. Pine Ridge Creek is located near Wheeler Peak on the west bench of the Snake Range. Originating at 8600 feet, Pine Ridge Creek flows approximately six miles and is inhabited by a native population of Bonneville (Utah) cutthroat trout, the original source for the transplanted population in Goshute Creek. The Shoshone Ponds, a preserve consisting of three ponds, is located approximately ten miles southeast of the southernmost proposed well fields. The Shoshone Ponds are inhabited by one of only two known endangered Pahrump killifish populations. Relict dace also inhabit the Shoshone Ponds.

3.2.4.6 Railroad Corridors

3.2.4.6.1 Soils

Railroad corridors traverse 16 soil mapping units in the County. These soils have characteristics ranging from well to poorly drained, slow to moderately rapid permeability, and slight to severe erosion potential. Land use and reclamation potential also varies between each unit.

3.2.4.6.2 Vegetation

The vegetation of the northern railroad corridors is essentially an extension of the patterns described for the three WPPP sites and surrounding areas. Shadscale and black greasewood comprise most of the valley floor vegetation, while big sagebrush, rubber rabbitbrush, and black sagebrush occur on the upland benches and lower valley. Pinyon-juniper woodland occurs in many of the passes above about 6800 feet.

The NNRy right-of-way is adjacent to saline meadows and ponds in Steptoe Valley. Alternate southern railroad corridors encompass numerous wetland areas including seeps, small ponds, and saline meadows.

3.2.4.6.3 Terrestrial Wildlife

Shrublands are the main habitat types associated with the railroad corridors. The corridor in the Egan Creek Pass also crosses pinyon-juniper woodland habitat representing higher elevations. Wetlands are crossed by corridors in Steptoe Valley and Spring Valley. These habitats support a variety of terrestrial wildlife including: 1) ferruginous hawk nesting areas; 2) sage grouse leks and wintering grounds; 3) pronghorn migration routes, kidding areas, and year round range; 4) mule deer migration routes, and spring and summer range; 5) wild horse year-round range); and 6) an important bald eagle wintering area in Antelope Valley.

3.2.4.6.4 Aquatic Ecology

Aquatic habitat of importance adjacent to the railroad corridors within the County is confined to corridors in Butte Valley and Spring Valley. This habitat consists of numerous springs inhabited by relict dace. In the White River Valley, a corridor passes near numerous springs and the White River, which are inhabited by White River spinedace, White River desert sucker, Preston White River springfish, and White River speckled dace.

Outside the County, important aquatic habitat occurs adjacent to railroad corridors in Butte Valley, White River Valley, Condor Canyon, Meadow Valley Wash, Independence Valley, and Clover Valley. The White River in Nye County contains habitat for White River springfish. In Lincoln

County, Condor Canyon contains habitat for Meadow Valley Wash (White River) desert sucker and Big Springs spinedace. Meadow Valley Wash is inhabited by Meadow Valley Wash speckled dace. In Elko County, Independence Valley supports habitat for Independence Valley speckled dace and Independence Valley tui chub. Clover Valley speckled dace inhabits springs in Clover Valley.

3.2.4.6.5 Threatened and Endangered Species

Listed and candidate threatened and endangered species that occur in or near the railroad corridors are shown on Figure 3-18.

3.2.5 Cultural and Paleontological Resources

Cultural and paleontological resources were identified through the preparation of a comprehensive literature overview and following a Class II archaeological survey of all three WPPP sites. Approximately 13 percent of the nine square miles surrounding each WPPP site was surveyed. As a part of the overview, a model was developed to predict site locations and site densities based on environmental variables, subsistence strategies, and the space and time limits of known prehistoric and historic population aggregates. The model, overview of known site locations, and previous survey work were used as baseline data to assess site occurrence to unsurveyed corridors for lineal facilities.

There are no NRHP listed or nominated properties on either the three WPPP sites or within the associated corridors. Procedures to complete formal eligibility determinations for potentially eligible properties are discussed in Section 4.1.5.5.

The following sections include baseline data on cultural and paleontological resources of the three WPPP sites and associated corridors. Additional information is included in the Cultural Resources Baseline technical report.

3.2.5.1 Butte Valley Site

Prior to investigations associated with WPPP, little archaeological work had been done on the Butte Valley Site. The recorded sites indicated a low potential for NRHP eligibility. Subsequent partial reconnaissance of the Butte Valley Site revealed three prehistoric sites, one historic site, and one site with both periods represented. When combined with other baseline information, this suggests that prehistoric site density in the area is low. Historic sites, including known trails, are present and represent a large portion of the identified cultural resources. Variability in site types is limited. Cultural resource sites are more prevalent in the southern portion of the Butte Valley Site, on the flatter alluvial areas between the hills to the west, and on the playa to the northeast. None of the sites located to date appear eligible for inclusion in NRHP.

The northwest corner of the Butte Valley Site is situated on Lower Pennsylvanian to Lower Permian strata and has a moderate paleontological potential. The remainder is on sediments mapped as Quaternary alluvium and is of low potential.

3.2.5.2 North Steptoe Valley Site

Only two surveys were conducted on the North Steptoe Valley Site prior to WPPP investigations. Most prehistoric sites found date to the Archaic and the Post-Fremont Periods and indicate a moderate potential for eligibility to NRHP. A partial reconnaissance of the North Steptoe Valley Site revealed 27 archaeological sites. Most are isolated prehistoric period finds or small artifact scatters. Survey results suggest that site density is highest in areas dominated by sand dunes and lowest in hardpan areas. Dunes are found in a broad band running diagonally through the North Steptoe Valley Site from northeast to southwest. There is a potential for buried archaeological remains in the dunes areas. Hardpan and playa areas are found in the northwest corner of the North Steptoe Valley Site. Archaeological site density on the piedmont in the southeast corner of the site is moderate. Several sites have been identified as potentially eligible to NRHP.

The North Steptoe Valley Site is located on sediments mapped as Quaternary alluvium. Paleontological potential is low. Fossils from nearby highlands may be present, but only as float.

3.2.5.3 Spring Valley Site

The Spring Valley Site received a large amount of archaeological attention prior to WPPP investigations. The recorded archaeological sites indicated a high potential for eligibility to NRHP. Prehistoric use of the area was highest during Archaic times. Fremont period sites are also likely. During a partial reconnaissance of the Spring Valley Site, 12 prehistoric sites and 1 historic site were recorded. Three periods (Archaic, Fremont, and Post-Fremont) are represented by large base camps containing numerous artifacts and features. About one-third of the cultural resource sites recorded on the Spring Valley Site may be eligible to NRHP.

The Spring Valley Site lies entirely within an area mapped as Quaternary alluvium. Potential for fossil occurrence other than float from adjacent Paleozoic rocks is low.

3.2.5.4 Transmission Line Corridors

Information on cultural resources within transmission line corridors is based on literature and previous projects. Most of the corridor segments have sites that indicate a low to moderate potential for eligibility to NRHP. Additional information on corridor segments with high potential is provided below.

The corridor segment in Spring Valley has abundant water along the western edge of the valley, and sites of all prehistoric periods should be numerous, with some quite large. Archaic and Post-Fremont Period sites should predominate. Ethnographic period sites have been recorded and local Native American interest in the corridor may be moderate to high. Historic period sites in the area are numerous and include several townsites dating to the 1870s and 1880s. Numerous archaeological projects have been undertaken along the corridor. As expected, a majority of the sites located in the County date to the historic period. Numerically, most of the recorded sites have been located in the Lincoln County where more work has been done. Prehistoric sites vary in size and no Fremont Period sites have been found within the corridor segment.

The corridor segment in Dry Lake Valley in Lincoln County has recorded prehistoric sites that exhibit a distinct distributional pattern. The sites, which tend to be small, cluster around the edges of the valley. Site density in this area is high. The central portion of Dry Lake Valley has a much lower site density. In contrast with better-watered areas, such as Moapa Valley, sites are more frequent along the banks of the stream course in the central part of the valley.

In addition to the above, the corridor segment between Steptoe Valley and Butte Valley via Egan Basin crosses several areas of projected high site density. These occur along the margins of the pinyon-juniper vegetation zone and thermal springs associated with Egan Creek. Sites are present that may be significant to Native Americans.

The potential for significant paleontological areas to occur in transmission line corridors is primarily low or moderate. The highest potential for paleontological localities to occur is in Lake Valley.

3.2.5.5 Well Fields and Pipeline Corridors

Baseline data suggest that the well fields located in Butte Valley are in zones of low prehistoric site density. Historic site density will vary (highest in the southern well field, lowest in the northwest field). Existing data show that, although a moderate amount of work has been completed in the three well field areas, few sites have been identified. The recorded sites confirm low prehistoric site density and moderate historic site density.

Five well fields are located in Steptoe Valley. Springs, present in the northernmost well field, should increase the prehistoric site density of the area. In addition, these springs may be of significance to local Native Americans. The next well field to the south is partially covered by stabilized sand dunes which are high in site density. Dunes are not as prevalent in the southern three well fields. The NNRy right-of-way is adjacent to the next well field south and the southernmost well field is located in an agricultural zone. The amount of previous work in the five well fields is inconsistent. The data suggest that site density decreases from north to south in Steptoe Valley.

The pipeline corridor between the North Steptoe Valley Site and the Butte Valley Site passes through several areas of projected high site density. These are along the margins of the pinyon-juniper vegetation zone, areas with thermal springs along Egan Creek, and the Hamilton to Cherry Creek stageline route. Sites are present that will be of possible significance to local Native Americans. The majority of previous archaeological research along the pipeline corridor is focused in Butte Valley, and numerous historic sites have been recorded.

Four well fields are located in Spring Valley. A review of existing data shows that few projects have been conducted, but a fair number of sites have been recorded. Data reveal that site density is variable and seems to be highest in the northwest field and lowest in the southwest field. Fremont Period sites may be present in the northwest field.

The well fields and pipeline corridors have a low potential for significant paleontological areas.

3.2.5.6 Railroad Corridors

Information on cultural resources within railroad corridors is based on literature and previous projects. Most of the corridors have sites that indicate a low to moderate potential for eligibility to NRHP. Additional information on railroad corridors with moderate to high potential is provided below.

Cultural resources found along the railroad corridor south of the Butte Valley Site will be varied. Pre-Archaic and Archaic Period site density around the margin of Jakes Valley should be high. Fremont Period sites may be found adjacent to the White River. The railroad corridor crosses the Hamilton to Cherry Creek stageline route. White River Valley should contain numerous sites related to agricultural use. Preston, one of the first agricultural communities in the County, is adjacent to the railroad corridor. Several archaeological investigations along the railroad corridor have located numerous sites. These data suggest that site density may be moderate and that the majority of sites encountered would not be large or complex. Larger sites, either individually or in clusters, would be found around major water sources. Historic period sites appear to be frequent. The railroad corridor passes well to the north of the White River Narrows NRHP site and is immediately adjacent to the Bristol Wells Townsite National Register Site. Historic properties on and eligible to the NRHP are present in and around Pioche, the southern terminus of the railroad corridor.

The railroad corridor north of the Spring Valley Site should have a wide range of cultural resources. The railroad corridor crosses, and often runs parallel to, pluvial beach terraces. Site density on these terraces should be higher than for other portions of the railroad corridor and Pre-Archaic Period sites are more likely here. At the northern end of Spring Valley, the railroad corridor nears stands of pinyon-juniper, and Archaic and Post-Fremont sites should predominate. The railroad corridor crosses the Pony Express route, and the site of the Spring Valley station is within the corridor. The railroad corridor runs along the edge of the Osceola mining district and may contain small historic sites dating to the period from 1870 to the early 1900s. The possible site at which a number of Indians were killed by a cavalry unit from Fort Ruby in 1863 is situated within the bounds of the railroad corridor.

The highest potential for significant paleontological areas is associated with the railroad corridor near Pioche.

3.2.6 Visual Resources

The following sections include baseline data on visual resources of the three WPPP sites and associated corridors. Additional information is included in the Visual Resources Baseline technical report.

3.2.6.1 Butte Valley Site

The Butte Valley Site is located in the southern portion of Butte Valley between the Butte Mountains and the Egan Range. The site is located on an alluvial fan formed by intermittent streams originating in the Butte Mountains to the west. Elevations at the site range from about 6200 to 6400 feet. The site is characterized by a natural landscape with a sparse distribution of scrub and brush vegetation. The Butte Valley Site is on land that is classified under the BLM VRM Program as interim Class 3. Elevations in the ranges to the west, northeast, east, and southeast of the site reach 9000 feet.

3.2.6.2 North Steptoe Valley Site

The North Steptoe Valley Site is located at the northern end of Steptoe Valley between the Cherry Creek Range and Schell Creek Range. Elevations at the site range from approximately 5800 to 6000 feet. The North Steptoe Valley Site slopes gently to the northwest and is characterized by a landscape in a natural dominance condition, with a sparse distribution of scrub and brush vegetation. The site is on land that is classified under the BLM VRM Program as interim Class 3.

U.S. Highway 93 travels in a northeast-southwest direction adjacent to the eastern boundary of the site. In addition, U.S. Alternate Highway 50, State Highway 35, and the NNRy are located in the vicinity of the site.

Mountains to the east and west of the site range to elevations exceeding 10,000 feet and have coniferous forest cover. The Goshute Canyon Natural Area and the Goshute Canyon Wilderness Study Area are located to the west of the site in the Cherry Creek Range.

3.2.6.3 Spring Valley Site

The Spring Valley Site is located within the south-central portion of Spring Valley between the Schell Creek Range and Snake Range. Elevations at the site range from approximately 5800 to 6000 feet. The Spring Valley Site is relatively flat and is located in a landscape in a natural dominance condition containing a sparse distribution of scrub and brush vegetation. The Spring Valley Site is on land that is classified under the BLM VRM Program as Class 4.

U.S. Highway 93 travels in a north-south direction west of the site. U.S. Highway 6/50 is located about four miles north of the site.

Elevations climb steeply in the mountain ranges located to the east and west of the site. The Wheeler Peak Scenic Area (including Wheeler Peak at 13,063 feet) is located approximately eight miles to the east of the site boundary. Portions of this scenic area overlook the Spring Valley Site. This dramatic change in topography creates an especially compelling scenic landscape. Coniferous forest (including bristlecone pine) covers many areas in the Schell Creek Range and Snake Range above 8000 feet in elevation. Both Wheeler

Peak and Highland Ridge are currently under study for suitability for wilderness designation by USFS.

3.2.6.4 Transmission Line Corridors

Generally, landscapes crossed by the transmission line corridors are in a natural condition, except near highways and existing transmission facilities which modify the landscape to a natural dominance condition. Sources of population exposure within the transmission corridors include U.S. Highway 50, U.S. Highway 6, U.S. Highway 93, State Highway 38, and State Highway 7. The corridors do not contain major permanent or recreational population sources.

The transmission line corridors cross areas classified as interim Class 3, Class 3, and Class 4 under the BLM VRM Program.

3.2.6.5 Well Fields and Pipeline Corridors

The well fields and pipeline corridors are located in natural and/or natural dominance landscapes, characterized by sparsely distributed scrub and brush vegetation. The well fields and corridors are in areas that have been classified under the BLM VRM Program as Class 3 and Class 4.

3.2.6.6 Railroad Corridors

The railroad corridors cross landscapes in natural and natural dominance conditions, characterized by sparsely-distributed scrub and brush vegetation. The railroad corridors cross lands designated as interim Class 3, Class 3, and Class 4 under the BLM VRM Program.

3.2.7 Socioeconomics

General socioeconomic information for the County is included in Section 3.1.7. Specific information associated with the three WPPP sites is primarily related to agriculture and ranching.

The rangelands of the County have provided grazing for domestic livestock since the first entry of sheep and cattle into the area. In order to standardize the evaluation of rangelands, it has become common practice by ranchers, administering agencies, and others having interest in land use, to measure rangeland production by animal unit month (AUM). An animal unit is the equivalent of a mature beef cow, weighing 800 or more pounds, with or without an unweaned calf. An AUM is the amount of forage or feed required by an animal unit for one month. This requirement (when based on forage consumed per day totaling 26 pounds) equals approximately 800 pounds per AUM.

Shallow Calcareous Loam (representative for the County) in an average year has a potential production average of 400 pounds per acre, of which an estimated three-fourths will be useable and available as livestock forage. An acre of Shallow Calcareous Loam would therefore provide approximately 300 pounds of livestock forage under proper stocking and range management. In keeping with the needs of the rangeland, only 50 percent, or 150 pounds per acre, should be removed by livestock. The 250 pounds remaining on the grazing lands will serve to protect soils from erosion, recycle nutrients, add to organic matter, conserve the vigor of the key forage species, and generally enhance plant growth conditions. The 150 pounds of useable forage per acre divided into the 800 pounds per AUM results in an acre per AUM requirement equal to 5.3.

Available data from the Soil Conservation Service (SCS) and field surveys were used to estimate the land productivity of the three WPPP sites. These estimates are listed in Table 3-18. Compared with the 5.3 acres per AUM requirement for the representative ecological site occurring in the County (Shallow Calcareous Loam), the three WPPP sites are lower in potential productivity.

A similar evaluation was used to estimate land productivity associated with railroad corridors. The AUM values for the corridors represent a range of land productivity for the ecological sites affected by railroad corridor development in the County. The SCS values are representative of an average stocking rate of 18.75 acres per AUM. Applying this data, the AUMs (and acres) associated with the preferred northern railroad corridors for the Butte Valley Site, North Steptoe Valley Site, and Spring Valley Site are 25 (465), 6 (105), and 56 (1042), respectively. Similar information for the southern railroad corridors are 60 (1106), 33 (620), and 16 (302), respectively.

CHAPTER 4

4.0 ENVIRONMENTAL CONSEQUENCES

The purpose of this chapter is to present the environmental consequences that could occur from construction and operation of WPPP. Both the proposed action and alternatives to the proposed action, as described in Chapter 2, are included. Potential impacts are related to the affected environment as described in Chapter 3. For air resources, water resources, and socioeconomics, only impacts from construction and operation of the power generation system on any of the three WPPP sites is discussed. For earth resources, ecological resources, cultural resources, and visual resources, the discussion of impacts is expanded to include construction and operation of the power transmission system, water supply system, and coal transportation system.

A detailed discussion of environmental impacts and proposed mitigative measures is included in Section 4.1. Subsequent sections discuss unavoidable adverse impacts, irreversible environmental changes, and the comparison of short-term uses with long-term effects.

4.1 ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES

4.1.1 Earth Resources

4.1.1.1 Erosion and Subsidence

Construction and operation of the power generation system and water supply system could have the following impacts on earth resources:

a. Increased erosion due to modification of existing drainages, soil compaction, and removal of vegetation.

b. Subsidence due to groundwater withdrawal from proposed well fields.

In the County, sediments are eroded from the mountainous areas, transported by fluvial processes, and deposited in the valleys on the surfaces of alluvial fans or in the playa areas. This occurs at the Butte Valley Site and Spring Valley Site. In addition, erosion in the form of sheet and rill wash occurs when soils have been compacted. However, erosion should not be considered a significant impact. (Erosion resulting from removal or alteration of vegetation is discussed in Section 4.1.4.)

Ground subsidence can occur whenever groundwater, oil, or minerals are extracted from subsurface strata. Groundwater will be withdrawn from local aquifers to satisfy WPPP water requirements. Information obtained from groundwater investigations indicates that the potential for ground subsidence from groundwater withdrawal is minimal and exists only in the immediate vicinity of the well fields.

4.1.1.2 Mitigation

Planned drainage control design measures should be sufficient to mitigate erosion and to control excess runoff in the site vicinity or along transmission line and railroad corridors.

4.1.2 Air Resources

Construction and operation of the WPPP Generating Station will result in various air emissions. Because WPPP is a new major stationary source with the potential to emit more than 100 tons per year of a pollutant subject to regulation under the Clean Air Act, a PSD Approval to Construct will be required from EPA. Registration certificates and operating permits will also be required from DEP. By final rule-making published in the Federal Register for June 21, 1983 (48 FR 28269), EPA Region IX has delegated full authority to DEP to implement and enforce the federal PSD program. However, DEP and EPA Region IX will have dual concurrence responsibility on WPPP.

The application for the PSD Approval to Construct was submitted to both EPA Region IX and DEP in June 1983. Requests for additional information were received in July 1983 and in February 1984. The application (NSR 4-7-3, NV 83-01) is currently being reviewed.

4.1.2.1 Air Quality Regulations

As discussed in Section 3.1.2.2.1, the Clean Air Act provides for the establishment of NAAQS to protect public health and welfare. These national standards are listed in Table 4-1. Major air quality regulations promulgated by EPA that affect WPPP are NSPS and PSD regulations. NSPS sets limits on the amounts of air pollutants emitted while PSD regulations limit potential air quality impacts.

NSPS emission limitations for specific types of pollutant emitting equipment associated with the WPPP steam generators are as follows:

- o Sulfur dioxide -- 0.6 pounds per million Btu and a minimum reduction of 70 percent of uncontrolled emissions.
- o Oxides of nitrogen -- 0.6 pounds per million Btu for bituminous coals and 0.5 pounds per million Btu for subbituminous coals.
- o Particulate matter -- 0.03 pounds per million Btu.
- o Opacity -- Less than 20 percent (6-minute average) except for one 6-minute period per hour of no more than 27 percent.

Class II PSD increments are listed in Table 4-1. The purpose of PSD regulations is to prevent significant deterioration of existing air quality where the existing air quality is better than NAAQS (i.e., in attainment). PSD review is required if a major stationary source attempts to locate in an area designated as attainment or unclassified for SO_2, NO_x, CO, PM, O_3, or Pb. Unclassified areas are treated as attainment areas under PSD. The North Steptoe Valley Site is unclassified for SO_2 and PM and attainment for NO_2, O_3 and CO. The Butte Valley Site and Spring Valley Site are attainment for SO_2, NO_2, PM, O_3 and CO. Attainment designations have not been made with respect to Pb.

WPPP is considered a major stationary source and, therefore, subject to PSD regulations because emissions of an attainment or unclassified pollutant exceed 100 tons per year test. If a source is subject to PSD regulations, three requirements must be satisfied:

a. The emissions must be controlled at a level equal to or greater than NSPS using BACT.

b. The calculated air quality impacts from the new source added to other nearby PSD sources must not exceed the PSD Class II increments for SO_2 and PM.

c. The calculated air quality impacts must not exceed NAAQS.

In addition, to be eligible for air quality permitting under PSD, WPPP must not have significant impacts on adjacent nonattainment areas.

State of Nevada ambient air quality standards are listed in Table 4-1. The State of Nevada has also promulgated a number of regulations that limit pollutant emissions and air quality impacts. The major regulations impacting WPPP are the State of Nevada PSD regulations. These regulations are similar to those promulgated by EPA.

4.1.2.2 Construction Impacts

Pollutant emissions during the construction period will result primarily from operation of heavy duty, diesel-powered and gasoline-powered construction equipment. These activities will result in the emission of NO_x, sulfur oxides, CO, hydrocarbons, and PM from equipment exhaust. In addition, paving work and painting would result in the release of some hydrocarbons. Localized increases in TSP would result from grading activities.

Emission rates will depend on the level of construction activity and weather conditions. In general, pollutant emissions will occur on an intermittent basis for short periods of time and, therefore, not produce significant long-term adverse impacts on local and regional air quality.

The EPA has generally concluded that construction-related emissions do not have a significant air quality impact since their impacts on ambient air quality are "short-lived." Therefore, EPA has exempted construction-related impacts from review (Title 40, Code of Federal Regulations, Part 52).

4.1.2.3 Operation Impacts

The major source of pollutant emissions during the operation period will result from the combustion of coal in the two steam generators. Other emission sources include the coal handling system vents, coal storage piles, limestone storage piles, waste landfill, auxiliary boiler, limestone calciner, emergency diesel-fueled generator, and fuel oil storage.

Federal and state air quality regulations define standards that WPPP must meet in order to prevent significant operational air quality impacts from occurring. It can be demonstrated that these standards are met by:

a. Determining air emissions from WPPP operation without any emission control equipment.

b. Applying emission control technology to reduce emissions.

c. Calculating air quality impacts of controlled emissions using air quality dispersion models.

If the calculated air quality impacts are below the established standards, WPPP is assumed to have no significant impact.

4.1.2.3.1 <u>Air Emissions</u>

The total annual emissions of all pollutants that will be a significant PSD source are listed in Table 4-2 for each of the WPPP sites. The emissions assume controls at least as stringent as NSPS which allows for protection of public health. Additional reductions would result from application of BACT for those pollutants which exceed the significance level.

Emissions were calculated based on the composite coal described in Section 2.1.4. This coal represents the quality of coal that is expected to be burned during the first 20 years of WPPP operation. The annual emission rates were based on WPPP operation at 100 percent of design capacity for the entire year (i.e., full load operation).

4.1.2.3.2 Control Technology

Eight of the ten pollutants listed in Table 4-1 exceed the EPA significance levels. Therefore, in order to comply with PSD regulations, the emissions of these pollutants must be controlled using equipment reflecting BACT.

SO_2 emissions from the steam generators will be controlled by the use of a dry-type flue gas desulfurization (FGD) system and the use of low-sulfur coal. Coal quality will be controlled in the coal handling system which will have the capability of blending up to four different coals. Lime for the FGD system will be produced in a calciner located on the WPPP site. SO_2 in the flue gas from the calciner will be removed by reaction with the lime/limestone in the calciner.

NO_x emissions from the steam generators will be controlled through system design. Low NO_x steam generators will be used to provide staged combustion of the fuel to minimize the formation of NO_x.

PM emissions resulting from fly ash and scrubber reaction products will be controlled through the use of fabric filters which will be a part of the FGD system. Other sources of particulates will also be controlled through the use of a wet handling system (for bottom ash), enclosed conveyors and transfer points (for coal, limestone, and lime), and fabric filters at handling facilities (for coal, limestone, and lime). In addition, the inactive coal pile will be designed to minimize wind-borne emissions.

CO emissions from the steam generators will be controlled through the use of a combustion control system in conjunction with an environmental flue gas monitoring system. The latter system will verify that the steam generators are being operated with minimum CO and NO_x formation.

BACT systems for Be, Hg, fluorides, and sulfuric acid mist are not commercially available for coal-fueled steam generators. However, these pollutants will also be controlled in the FGD system. Be, Hg, and fluorides in the fly ash will be removed in the fabric filters. The SO_2 removal system will also be designed to minimize sulfuric acid mist.

4.1.2.3.3 Air Quality Impacts

Air quality impact estimates were made with the COMPLEX I, MPTER, and ISC dispersion models made available by EPA on the UNAMAP 4 computer tape. The COMPLEX I model was used to calculate concentrations due to steam generator emissions for receptors at or above stack height. This model can estimate the effect of topography on stack gas emissions. The MPTER model was used to calculate concentrations for receptors below stack height. Emissions from the calciner were modeled separately from the steam generators. In modeling NO_2 air quality impacts, all NO_x emissions were conservatively assumed to be converted to NO_2 before reaching ground level. (Additional technical information on dispersion models used for WPPP is included in the air quality permits.)

Full load emission rates were used to calculate annual average concentrations. The MCR (turbine valves wide open and five percent overpressure) was used to calculate concentrations for averaging periods of 24 hours or less. Meteorological data used in the models were based on monitored data gathered at each WPPP site.

Air quality regulations include the requirement for showing no significant impact on ambient air quality (PSD increment analysis) and compliance with NAAQS. Compliance with PSD is shown by comparing the air quality impact of WPPP (including other new sources in the area) with incremental impact criteria (PSD Class II increments). Because there are no other new sources in the WPPP area, compliance with PSD is shown by comparing the WPPP calculated air quality impacts with the PSD increments. Compliance with NAAQS is shown by adding the maximum calculated WPPP impacts to the maximum background air quality levels measured on or near each site.

The results of the air quality modeling calculations are summarized in Table 4-3. These data include maximum calculated air quality impacts at each of the three WPPP sites. Maximum concentrations of SO_2, NO_2, and CO were predicted to occur in high terrain areas as a result of steam generator emissions. Maximum PM concentrations were predicted to occur near the site boundaries and resulted primarily from materials handling emissions. The results listed in Table 4-3 indicate that WPPP will be in compliance with all applicable air quality regulations.

4.1.2.3.4 Visibility Impacts

Visibility impacts from a new source are of primary concern in PSD Class I areas. There are no PSD Class I areas within 100 kilometers of any of the three WPPP sites. EPA Region IX requirements do not require a quantitative assessment of visibility impacts in Class I areas beyond 100 kilometers. However, a Visibility Screening Analysis was conducted to assess impacts from WPPP emissions on surrounding visibility. The results did not indicate any visibility impairment at any Class I or other scenic area.

On occasion, the power plant plumes may be visible within a short distance of the stacks due to emissions of SO_2, NO_x, and PM. However, because of the type of air pollution control equipment to be used, it is expected that any visible plume will be confined to the site vicinity.

4.1.2.3.5 Soil Impacts

The soils of the County are highly alkaline. Deposition of sulfates and nitrates, which may form from SO_2 and NO_x emissions, would have a neutralizing effect on alkaline soils and no adverse impacts are anticipated. Air emissions (including NO_x and SO_2) have the potential to adversely affect plant species such as pinyon and juniper which are sensitive to changes in air quality. However, air quality models do not indicate concentration levels high enough for injury to plant species. Therefore, this secondary impact is not expected to occur. In addition, all calculated air quality impacts are at levels substantially below secondary NAAQS. These secondary standards were set to protect public welfare against any known or anticipated adverse effects. Compliance with secondary NAAQS will not result in impacts on soils and vegetation.

4.1.2.4 Permit Application

The application for the PSD Approval to Construct was submitted to both EPA Region IX and DEP by letter dated June 27, 1983. Requests for additional information were made by EPA and DEP and responses have been provided. Proposed control technologies are described in Section 4.1.2.3.2. Actual emission levels will be determined by the BACT evaluation currently in progress. However, any permitted levels would not result in emissions that would cause significant impacts to public health.

4.1.2.5 Mitigation

Air quality impacts from the WPPP Generating Station will be below levels defined in federal and state regulations. Compliance with these regulations will ensure that there will be no significant impact on ambient air quality. Therefore, no mitigation in addition to the BACT systems is proposed.

The Draft EIS stated that implementation of the White Pine County Air Proposal would have resulted in a net air quality benefit in the County. A principal component of the proposal was that savings from reducing the percent of SO_2 removal at the WPPP Generating Station to a level required by NSPS would be contributed toward an emission reduction at the McGill smelter. The EPA Assistant Administrator for Air, Noise, and Radiation gave conceptual approval to this proposal by letter dated April 16, 1982.

During review of the WPPP air permit application, EPA Region IX requested additional information including requirements that were not consistent with earlier agreements associated with the White Pine County Air Proposal. A request for clarification of the additional requirements was made to EPA Region IX. The response from the EPA Administrator for Air and Radiation represented a significant departure from the principles of the White Pine County Air Proposal.

Because of the uncertainties associated with changes in EPA policy, additional information was prepared to support a standard air permit application. The information is based on SO_2 controls that are more stringent than NSPS requirements.

4.1.3 Water Resources

Construction and operation of the power generation system and water supply system could have direct impacts on water resources due to the following:

a. Groundwater withdrawals to meet the project water requirements.

b. The disposal of fly ash, bottom ash, and FGD products.

Secondary impacts could occur due to disturbance of the land surface and natural drainage patterns during construction and operation. In addition, the potential exists for degradation of surface water and groundwater quality due to runoff and leachate from the coal storage areas. The latter will be mitigated because the plant will be designed for "zero liquid discharge" from the site (Section 2.1.1.2).

The construction and operation of the power transmission system will have no major impacts on water resources. Potential hydrologic impacts will be minimized or eliminated through the implementation and maintenance of a drainage and erosion control program on the transmission line rights-of-way.

The construction and operation of the coal transportation system will have no major impacts on water resources. Disturbance during construction and induced changes in the natural surface drainage patterns may increase the potential for wind and water erosion and sedimentation. These potential problems, however, will be minimized or eliminated through the implementation of drainage and erosion control programs.

It is estimated that WPPP will require up to 25,000 afy of water, primarily for cooling requirements. This amount could vary depending on the final plant design, quality of the water, and type of cooling system selected. The water has been secured through the groundwater appropriation process. The following sections summarize information related to water resources, identified impacts, and proposed mitigation.

4.1.3.1 Groundwater Withdrawals

In order to estimate potential impacts to existing water resources, a three-phase groundwater investigation was conducted in the County. A summary of the groundwater investigations is included in Section 2.2.4.2.

4.1.3.2 Groundwater Modeling

The Phase 3 studies included computer modeling to assess the magnitude and extent of possible groundwater level changes due to WPPP groundwater withdrawals. Groundwater modeling studies were conducted in two stages. During the first stage, preliminary estimates of the drawdowns due to pumping were made for each of the three WPPP sites and the associated well fields.

The second stage of the studies involved detailed model predictions using a two-dimensional, finite-element computer model of the potential drawdowns due to groundwater withdrawals in Steptoe Valley and Spring Valley. The model predictions and the assigned aquifer characteristics for the computer predictions were based on the results of pumping tests in those valleys and other available information on the geology and existing groundwater conditions. Butte Valley was not modeled because of its low potential for impacts on existing users or sensitive species.

The procedure used in the modeling of the drawdown effects due to pumping entailed model calibration, model verification, and prediction. Calibration of the finite-element model involved the trial and error adjustment of both the areal distribution and magnitude of aquifer parameters and boundary conditions. The calibration criteria were based on the predicted versus observed groundwater surface elevation for each of the two valleys modeled.

Both Steptoe Valley and Spring Valley were modeled as "confined" aquifer systems with uniform aquifer thickness. In essence, the valley-fill aquifer was treated as a horizontal layer, both overlain and underlain by "low" permeability or confining strata. The predicted drawdowns as a result of WPPP groundwater withdrawals, therefore, reflect the decrease in the pore pressure (or head) within the aquifer system and not a lowering of the water table.

The transmissivity and storage coefficients were varied spatially, depending on location, with respect to the central playa areas and more permeable alluvial fan areas on the margins of the valley floor. A constant head boundary condition, which effectively holds the pore pressure or head along the perimeter of the calculation domain constant, was employed in all model predictions. The perimeter of the calculation domain generally corresponded to the limits of the in-filled valley floor.

Leakage from the material overlying and underlying the previously modeled confined aquifer system was not considered and, therefore, the predicted drawdowns are greater than those that would occur if leakage were taken into consideration. The specification of a fixed boundary condition on the perimeter of the calculation domain will result in an underestimation of actual drawdowns near the outer edges of the valley floor. This assumption with regard to boundary conditions, however, would not significantly affect the predicted drawdowns in the central portion of the valley which, from an environmental perspective, tend to be the most sensitive.

Drawdowns were computed for various development scenarios over the 36-year life of WPPP. The three principal scenarios analyzed for both Spring Valley and Steptoe Valley are:

a. Case I - Current agricultural withdrawals plus 20,000 afy for WPPP.

b. Case II - Current agricultural withdrawals plus 25,000 afy for WPPP.

c. Case III - Current agricultural withdrawals plus 15,000 afy for future agriculture use and 25,000 afy for WPPP.

Case I represents the "most likely" case in which the actual groundwater withdrawals for WPPP would be approximately 20,000 afy. Case II represents the "permitted" level of groundwater withdrawal for WPPP. Both Case I and Case II are based on the assumption that groundwater withdrawals for agriculture would remain constant (and at their current levels) over the life of the project. Case III is the "worst case" scenario in which the groundwater withdrawals for agricultural use are increased by approximately 15,000 afy above their current level.

The predicted drawdowns at the end of 36 years of pumping for Case II are shown on Figure 4-1 and Figure 4-2 for Steptoe Valley and Spring Valley, respectively. Preliminary drawdown estimates for Butte Valley shown on Figure 4-3 are based on a simplified finite difference model and assumed aquifer characteristics.

Comparison of Figure 4-1 and Figure 4-2 indicates that the predicted drawdowns for Spring Valley are significantly greater, both in areal extent and in magnitude, than those predicted for Steptoe Valley. The greater drawdown effects in Spring Valley are due to the lower transmissivity values used in the model. The predicted drawdowns in those elements adjacent to the wells average 15 to 20 feet for Steptoe Valley compared to 30 to 40 feet for Spring Valley. Similarly, predicted drawdowns in individual wells in Steptoe Valley range from about 125 to 135 feet as compared to 120 to 240 feet for individual wells in Spring Valley.

Existing wells within the radius of influence (i.e., the area affected by drawdown due to groundwater withdrawal) of the well fields will be impacted. The degree to which existing wells are impacted will depend on their location relative to the well field, their depth and construction, and if they are completed in the same zone as the WPPP production wells.

The drawdown predictions for Steptoe Valley and Spring Valley are based on a total project water requirement of up to 25,000 afy for the estimated 36-year life of the project. The total project demands represent approximately 30 percent and 36 percent of the estimated perennial groundwater yield for Steptoe Valley and Spring Valley, respectively. This does not include "salvage" of surface runoff that currently wastes to the central playa areas and evaporates because the aquifer is full. In Spring Valley, for example, the USGS and NDCNR estimate that as much as 25,000 afy of "rejected" recharge is lost to evaporation from the playas. At least a portion of this could be salvaged by induced recharge as a result of increased pumping.

As shown on Figure 4-1 and Figure 4-2, the drawdown cones due to groundwater withdrawals for WPPP extend into the central portions of both Steptoe Valley and Spring Valley. As a result, the position of the groundwater table will be lowered locally and may impact those vegetative communities dependent on maintenance of high water table conditions. The associated impacts on soils and vegetations are discussed in Section 4.1.4.3. Areas such as the saline meadows (shown on Figure 4-1 and Figure 4-2) may be impacted, resulting in a shift in species composition and a change in forage value.

Based on the predicted drawdowns for Steptoe Valley, no direct impacts on the several thermal springs located on the west side of the valley in the vicinity of Cherry Creek will occur.

As shown on Figure 4-2, the predicted drawdowns in the vicinity of the Shoshone Ponds in southern Spring Valley are less than five feet. Because the ponds are within the radius of influence of the well fields, a potential does exist that these ponds could be impacted as a result of groundwater withdrawals for WPPP. Additional site-specific investigations, however, would be required to assess the probable nature and severity of any impacts. The available information indicates that the primary source of water for the Shoshone Ponds is obtained from a flowing artesian well which is screened at a depth of 421 to 441 feet. Any reduction in pore pressure or head in the production well as a result of groundwater withdrawal for WPPP or by others for mitigation will result in a decrease in the discharge from the Shoshone Ponds water supply well. Depending on the magnitude of this decrease, a reduction in the flow could potentially impact Shoshone Ponds. The impact on aquatic habitat in Shoshone Ponds is discussed in Section 4.1.4.3.

Predicted drawdowns in individual wells in Butte Valley are approximately 50 feet. Because of the depth to the groundwater table, however, increased drawdowns due to pumping will not likely have a significant environmental impact. Similarly, the drawdowns due to WPPP will have minimal impact on other users.

4.1.3.3 Water Permit

The Nevada Division of Water Resources has the responsibility of administering Nevada water rights procedures and policies. In order to appropriate groundwater, an application must be made to the State Engineer. If sufficient water is available and if no unreasonable infringement with existing water rights is apparent, a permit may be issued to develop the water for beneficial use. A permit to appropriate water grants the right to use water from a particular source at a definite location for a specified purpose. The permitted right becomes a legal and complete appropriation (a certificated right) upon compliance with the following conditions:

a. Completing works of diversion.

b. Placing the water to beneficial use.

c. Filing the proofs of completion and of beneficial use.

The general policy of the State Engineer is to limit groundwater withdrawals from a basin or valley to the average annual recharge to the groundwater basin. Interbasin transfers are not prohibited and several transfers have been approved by the State Engineer. The State Engineer also has the authority to "designate" a preferred use of water from a groundwater basin or valley in order to establish better control of groundwater sources in the area. Application to appropriate water for purposes consistent with the designated preferred use are given priority over other applications.

On August 17, 1983, a public hearing was held in Ely, Nevada, to discuss the preferred use designation for Steptoe Valley and the pending WPPP applications in Steptoe Valley. At the conclusion of the hearing, the Nevada State Engineer ruled that industrial use (power generation) would be the preferred use for the Steptoe Valley Groundwater Basin, excluding the Groundwater Curtailment Area. In addition, the State Engineer granted water permits to WPPP subject to the following conditions:

a. The total duty will not exceed 25,000 afy.

b. The siting of WPPP will be in Steptoe Valley.

c. WPPP will continue to participate in a surface water and groundwater monitoring program to determine the effects of withdrawal of groundwater granted under the permits.

d. WPPP will exercise reasonable diligence to perfect the appropriation.

e. Totalizing meters will be installed on each well and accurate measurements of all water placed to beneficial use will be submitted to the State Engineer.

f. The final determination of limit and extent of rights granted will be based on the actual amount of water placed to beneficial use.

The surface water and groundwater monitoring program began in December 1982. The purpose of the monitoring program is to establish baseline data for current seasonal groundwater level fluctuations in Steptoe Valley. Levels in selected existing wells and flow rate measurements in selected springs will be monitored.

In addition to the monitoring program in the County, WPPP is participating in the Eastern Nevada Hydrology Study. The long-range study is a cooperative effort with the Nevada State Engineer and USGS to investigate groundwater basins in the County with emphasis on the interconnection with surface water discharge areas, interbasin flow systems, and the interconnection of the shallow aquifers and the deep carbonate systems.

4.1.3.4 Water Quality

The potential for degradation of surface water and groundwater quality in Butte Valley from solid waste management and disposal activities is considered moderate. In general, the water table is moderately deep under the Butte Valley Site although locally the surficial soils may be of moderate to high permeability.

The North Steptoe Valley Site is located within an area of groundwater discharge. As a result, there is a pronounced upward component of groundwater flow, as well as a lateral flow component toward the center of the valley. The upward flow condition within the site will minimize the potential for downward migration of any contaminant. The potential for leachate generation within the ash disposal area is low under the prevailing climatic regime.

Potential impacts in Spring Valley would be similar to those associated with the Butte Valley Site and North Steptoe Valley Site.

The potential for degradation of water quality under the waste disposal area will be minimized through the use of a suitable leachate liner, if necessary, and capping of the waste materials with a suitable cover.

The major chemical constituents of WPPP coal ash will include phosphorous pentoxide, silica, ferric oxide, alumina, titania, lime, magnesia, sulfur trioxide, potassium oxide, and sodium oxide. Scrubber reaction products will consist of sulfates, sulfites, lime, and inerts. Leaching of contaminants through the solid waste landfill is unlikely because the potential for evaporation is in excess of the average annual precipitation on the site. However, both the solid waste landfill and the bottom ash basins will be designed to prevent seepage.

Steam generator blowdown will contain hydrazine, ammonia, free hydroxide, and sodium triphosphate. Cooling tower blowdown will contain calcium, magnesium, sodium, sulfate, chloride, silica, and polyacrylate. These constituents will be contained because of the "zero liquid discharge" design.

4.1.3.5 Mitigation

The information from the monitoring program discussed in Section 4.1.3.3 will be used to identify impacts before they become significant in order to apply the appropriate mitigative measure. Typical mitigative measures could include variable operation of the well fields to compensate for localized seasonal fluctuations and installation of additional wells to supplement water supplies.

Even if leakage were to occur from areas discussed in Section 4.1.3.4, leakage detection facilities such as monitoring wells would allow sufficient time to take appropriate actions to preclude the point discharge of liquid wastes beyond the site boundaries.

4.1.4 Ecological Resources

Development of WPPP will affect ecological resources in several ways. Construction of WPPP will disturb soils and vegetation, and eliminate the habitat and grazing they currently provide. The quality and quantity of such resources, as well as the significance of impacts to these resources, varies with location within the WPPP region.

Other aspects of WPPP may cause less immediate effects to the ecosystem. For example, wetlands and aquatic systems could be affected over time by decreased soil moisture content due to lowering the water table, or alteration of water sources for important aquatic habitat as a result of groundwater withdrawals. A secondary impact anticipated during construction is the potential for weedy species to invade disturbed areas. The spread of weedy species could reduce the amount of forage available near site and corridor boundaries.

Secondary impacts to sensitive plant species due to air emissions from the WPPP Generating Station are discussed in Section 4.1.2.3.5. In addition, impacts associated with land productivity are discussed in Section 4.1.7.9.

Impacts to ecological resources as well as mitigation are discussed in the following sections.

4.1.4.1 Power Generation System

4.1.4.1.1 Butte Valley Site

There is a potential for disturbance of 2480 acres of land on the Butte Valley Site. Table 4-4 lists the potential disturbance to soils and ecological sites associated with the Butte Valley Site.

Most of the impacts on the Butte Valley Site are anticipated to be insignificant. This is due primarily to the fact that WPPP will be designed to have long-term facilities on low reclamation potential soils in most of the area.

Construction and operation of WPPP at the Butte Valley Site would primarily affect Wyoming big sagebrush and black sagebrush communities that occur on the Loamy 8-10 and Shallow Calcareous Loam 8-12 ecological sites. However, ecological sites which produce desirable forage such as winterfat and Indian ricegrass would also be affected. Annual vegetation production losses could range from 150 to 950 pounds per acre depending on the ecological site. The removal of wildlife and livestock forage and habitat is considered a long-term impact.

Halogeton is currently a problem in Butte Valley and the potential exists for this, and other invader species (e.g., Russian thistle, thistles, and annual mustards) to colonize disturbed areas.

Construction and operation at the Butte Valley Site would disturb a ferruginous hawk nest located in the southwest corner of the site. Limited sage grouse use of the site would be preempted and minor reductions in use of mule deer winter range on benches adjacent to the site would occur. Butte Valley is being considered for introduction of pronghorn by the NDOW and WPPP may reduce the value of the site for pronghorn range.

In response to increased human activity, the potential exists for increased harassment and possible poaching of overwintering bald eagles. In addition, construction and operation at the remotely located Butte Valley Site will increase vehicular traffic between Ely and the site, thereby increasing the potential for wildlife road fatalities and poaching. The increase in human activity will also temporarily impact local wild horse herds in the County. However, these impacts are expected to be insignificant as the herds usually relocate to avoid human encroachment.

No major direct impacts to aquatic ecology are anticipated due to development of the Butte Valley Site. However, indirect impacts include the potential for impacting relict dace habitat due to increased human activity in Butte Valley.

4.1.4.1.2 North Steptoe Valley Site

There is a potential for disturbance of 2250 acres of land on the North Steptoe Valley Site. Table 4-4 lists the potential disturbance to soils and ecological sites associated with the North Steptoe Valley Site.

Construction-related impacts to soils on the North Steptoe Valley Site are expected to be insignificant in terms of existing land use and ability to support agriculture. For the most part, these soils are generally low in vegetative production and are difficult to reclaim due to a high pH, moderate salinity, and highly sodic characteristics. However, reclamation difficulty of some of the soils on the North Steptoe Valley Site may magnify initial losses that occur during construction and may render these soils susceptible to erosion.

Construction and operation of WPPP at the North Steptoe Valley Site would primarily affect shadscale and black greasewood-dominated plant communities of the Sodic Terrace 6-8, Sodic Terrace 8-10, and Loamy 5-8 ecological sites. However, smaller acreages of big sagebrush and saline meadows could also be removed. Annual vegetation production losses could range from 200 to 3000 pounds per acre depending on the ecological site. The removal of wildlife and livestock forage and habitat is considered a long-term impact.

During construction, there is a potential for halogeton and other invader species to colonize disturbed areas.

Development of the North Steptoe Valley Site will eliminate only a small percentage of the year-round pronghorn habitat in Steptoe Valley. Additionally, utilization of winter range for pronghorn and mule deer on benches adjacent to the site may be reduced due to increased human activity. However, winter range is not the limiting factor for either species and, therefore, neither population should be adversely affected. Existing industrial and agricultural development in Steptoe Valley have already impacted wildlife in the area. Therefore, the potential exists for only minor increases in wildlife road fatalities and poaching in response to increased human activity associated with WPPP.

Direct impacts to aquatic ecology resulting from development of the North Steptoe Valley Site are anticipated to be negligible. However, possible indirect impacts due to increased human activity could adversely affect the Bonneville (Utah) cutthroat trout population in Goshute Creek located northwest of the site. Stream-dwelling cutthroat trout are vulnerable to angling pressure and unregulated or unrestrained exploitation could suppress the reproducing sector of the population to an unrecoverable level.

Groundwater withdrawals could impact wetland areas in Steptoe Valley. Drawdowns shown on Figure 4-1 are associated with a lower aquifer that has little or no effect on wetlands. However, leakage from the upper aquifer could affect near-surface levels but the degree of impact is not known. Spring sources for wetlands are not expected to be impacted.

4.1.4.1.3 Spring Valley Site

There is a potential for disturbance of 2380 acres of land on the Spring Valley Site. Table 4-4 lists the potential disturbance to soils and ecological sites associated with the Spring Valley Site.

Construction and operation of WPPP at the Spring Valley Site would primarily affect plant communities dominated by black sagebrush (Shallow Calcareous Loam 8-12) and winterfat (Silty 8-10). Areas of Wyoming big sagebrush (Loamy 8-10) would also be disturbed during construction, although this community covers the least amount of the potentially affected area. Annual vegetation production losses could range from 300 to 950 pounds per acre depending on the ecological site.

The removal of wildlife and livestock forage and habitat is considered a long-term impact. During construction, there is a potential for halogeton and other invader species to colonize disturbed areas.

Direct impacts to wildlife at the Spring Valley Site will include removal of less than one percent of the Spring Valley year-round pronghorn range within the County and reductions in mule deer usage of winter and spring range located on benches adjacent to the site. Population levels are not expected to be reduced significantly by these direct impacts. However, in response to increased human activity associated with WPPP in Spring Valley, the potential exists for increased harassment and possible poaching of pronghorn and overwintering bald eagles. Increased vehicular traffic between Ely and the site will increase the potential for wildlife road fatalities.

No major direct impacts to aquatic ecology are anticipated due to development of the Spring Valley Site. However, indirect impacts due to increased human activity could affect stream and reservoir fisheries in Steptoe Valley and could adversely affect the Bonneville (Utah) cutthroat trout population in Pine Ridge Creek. An increase in human activities could also increase the potential for vandalism of Shoshone Ponds as well as impact relict dace populations.

Groundwater withdrawals could impact wetland areas in Spring Valley. Drawdowns shown on Figure 4-2 are associated with a lower aquifer that has little or no effect on wetlands. However, leakage from the upper aquifer could affect near-surface levels but the degree of impact is not known. Spring sources for wetlands could also be affected but the degree of the impact is not known.

4.1.4.2 Power Transmission System

Relative impact severity of the power transmission system on ecological resources is shown on Figure 4-4.

Construction of access roads along the power transmission system and the clearing of areas for tower erection will be the principal activities that would disturb soils. Construction and continued use of access roads will result in long-term impacts to the soil resource, although most soil types have a fair potential to be successfully reclaimed.

The types of vegetation affected by construction of the power transmission system will depend upon the actual location of the towers and access roads. Clearing operations for transmission towers and access roads would result in removal or burial of vegetation. The long-term impact would be limited to the access road and the area around the transmission tower footings.

Although northern desert shrub, salt desert shrub, and Mojave desert communities would primarily be affected, pinyon-juniper woodland would be traversed in areas above about 6000 feet.

Direct impacts on wildlife are expected to be insignificant and will occur only during construction. Mule deer, elk, and pronghorn ranges are traversed by transmission line corridors. South of the County, desert bighorn sheep range and restricted distributional range of desert tortoise are also traversed by transmission line corridors. Impacts on these areas are expected to be limited to minor disturbances during construction. Additional potentially minor impacts could also include disturbances of sage grouse leks and ferruginous hawk nesting areas. Electrocution of raptors is highly improbable because conductor phase spacing of the transmission lines will be greater than the wing span of these birds.

Potential secondary impacts to wildlife from the power transmission system are related to increased road access and the resulting increase in human encroachment. Establishment of construction and maintenance roads along transmission lines will potentially increase desert tortoise road fatalities, particularly along the southernmost corridors where the desert tortoise is more abundant. Additional impacts will include the potential for increased poaching of game species and harassment of desert bighorn sheep, ferruginous hawks, elk, and pronghorn.

The construction of the power transmission system will temporarily disturb soils in the area. The establishment of transmission lines adjacent to springs in White River Valley, which are inhabited by several proposed fish species, and across Steptoe Creek, which is inhabited by game fish in Steptoe Valley, may create increased erosion and sedimentation in the stream and springs until the disturbed areas become revegetated. Impacts to streams are expected to be minor and temporary because of spring flushing, which rids the stream substrate of silt and sediment thereby providing conducive habitat for production of fish food organisms. However, in springs not influenced by flushing, sedimentation due to construction activities could inhibit forage productivity. Overall, sedimentation impacts are anticipated to be minor and temporary.

4.1.4.3 Water Supply System

Impact ratings associated with impacts on ecological resources associated with the water supply system for each of the three WPPP sites are shown on Figure 4-5, Figure 4-6, and Figure 4-7.

Soils will be disturbed by trenching and other water pipeline construction activities. This impact is considered short-term if reclamation can be quickly implemented on the pipeline berm. Pipeline access and maintenance roads will result in long-term impacts on soil resources, especially in areas where reclamation potential of soils is considered fair.

Soils could sustain varying degrees of impacts from the water table drawdowns due to groundwater pumping. If drawdown causes a reduction in soil moisture at subirrigation levels, soils will dry out and render them susceptible to wind erosion. As the zone of natural subirrigation is diminished, hay yields could also be affected. Another potential impact is associated with the reduction of organic matter input in the soil as plant growth in saline meadows decreases.

Trenching for the pipeline and clearing for adjacent roads and the electrical supply system will remove a certain amount of vegetation. This removal is considered to be a short-term impact because revegetation could be quickly implemented on the berm. Impacts associated with water supply system roads would be long-term.

The Butte Valley Site well fields and water conveyance pipelines involve areas in Butte Valley and Steptoe Valley. Water table drawdown due to well field operation has the potential to affect Saline Meadows 5-12, Saline Bottoms 5-12, and Sodic Flats 5-12 ecological sites. Groundwater modeling indicates a moderate potential exists for subirrigation levels to be reduced in Steptoe Valley and a high potential for subirrigation levels to be reduced in Spring Valley. These impacts would occur only in the vicinity of the well fields.

Construction of the Butte Valley well field could impact a sage grouse wintering area and a ferruginous hawk nesting area in Butte Valley. Wintering areas are frequently essential to sage grouse populations and disturbances related to construction activities could render these areas less desirable for sage grouse. Activities associated with access road traffic may force ferruginous hawks to abandon nests near the well fields and pipelines.

Additional well fields associated with the Butte Valley Site occur in Steptoe Valley and are located adjacent to a Saline Meadow area which provides wetland habitat for wildlife. Wetlands increase the biological diversity of the area and provide staging and breeding habitat for many species of waterfowl and shorebirds. Based on groundwater modeling, groundwater withdrawal could potentially affect a portion of the wetlands in the vicinity of the well fields. Wetlands traversed by the pipeline would be adversely affected during construction. Although effects such as siltation could be severe, the duration would be short.

Sage grouse may abandon leks and brooding grounds in response to increased activities near the well fields and a mule deer migration route may be slightly altered due to the establishment of a well field in Steptoe Valley. A ferruginous hawk nest located adjacent to the well field would be impacted if construction occurred during the nesting period.

The North Steptoe Valley Site well fields and water conveyance pipelines involve areas in Steptoe Valley discussed above for the Butte Valley Site plus additional areas to the north and south. As discussed previously, water withdrawals could potentially impact wetlands, including swamp cedar, located adjacent to the well field. Because the North Steptoe Valley Site requires a large well field in the northern part of Steptoe Valley, a relatively larger wetland area could be affected.

The Spring Valley Site well fields and water conveyance pipelines will impact sage grouse and wetlands. Sage grouse leks and a wintering area, both important to maintaining sage grouse abundance, could be disturbed by construction activities. Predicted drawdown of the Spring Valley well field indicates that most of the wetland north of Highway 50 and within the BLM-Spring Valley Waterfowl Habitat Management Area could potentially be affected. The primary objective of the BLM Spring Valley Waterfowl Management Plan centers around preserving, maintaining, and improving wetland habitats. Lowering the water levels of the Spring Valley wetlands could jeopardize existing Canada geese, sandhill crane, cinnamon teal, American pintail, gadwall, common mallard, pied-billed grebe, and snowy egret nesting habitat.

The water supply system development in Steptoe Valley or Spring Valley could impact existing important aquatic habitats. Potential impacts in Steptoe Valley include minor alterations of relict dace habitat within the springs, ponds, and intermittent lakes resulting from reduced groundwater supplies. Limited relict dace populations occur throughout Ruby Valley, Butte Valley, Goshute Valley, Spring Valley, and Steptoe Valley and the minor disturbances of isolated habitats in one valley would probably not jeopardize the continued existence of the species. This, however, should not preclude the implementation of measures designed to preserve existing habitat potentially affected by groundwater withdrawal in Butte Valley, Steptoe Valley, or Spring Valley. Any reduction of population numbers or habitat could justify listing the relict dace as threatened or endangered.

Although groundwater modeling results indicate WPPP groundwater withdrawals in Spring Valley may potentially lower existing water levels near the Shoshone Ponds by two to three feet, actual water level fluctuations within the ponds should not deviate appreciably from normal seasonal fluctuations. The surrounding natural subirrigated substrate and the water source contribute to maintaining the favorable conditions for the federally listed, endangered Pahrump killifish in the Shoshone Ponds.

The Shoshone Ponds water source consists of a flowing artesian well which originates approximately 400 feet below the ground surface. A relatively impermeable layer of clay beneath the Shoshone Ponds, in combination with the upward hydraulic gradient within the groundwater system, supports the zone of natural subirrigated substrate and inhibits downward movement of surface water. A majority of the subirrigated water loss is attributed to evapotranspiration which will occur regardless of WPPP development. The anticipated two to three foot drawdown could potentially lower the hydrostatic pressure in the deep aquifer.

The potential also exists for reducing groundwater pressure within zones which are hydrologically connected with, and overlie, the deep aquifer. Reducing the hydrostatic pressure in the deep aquifer or within any interconnecting zones by withdrawing groundwater will reduce the artesian pressure and, in response, the discharge into the Shoshone Ponds. The predicted magnitude of drawdown is small compared to existing pressure levels and, therefore, the associated impact to the Shoshone Ponds is also expected to be minimal. However, any alteration in waters inhabited by the Pahrump killifish should be regarded as a significant impact.

Corresponding to the potential for a minor decrease in flow and the resulting lower water volume within the Shoshone Ponds, water temperatures may also decrease slightly during winter months thereby creating a potentially less than optimal (76°F) environment for the Pahrump killifish. The Pahrump killifish has been known to survive in southern Nevada for limited periods in waters considerably lower than 76°F. However, the long-term effects on viability in waters below 76°F are not known. Because winters are likely to be more severe near the Shoshone Ponds than in southern Nevada, the cooling influence on the Shoshone Ponds is expected to be greater and temperatures within the pond may decrease for extended periods should the existing thermal influence be altered.

In addition to the well fields, the water supply system will incorporate low-voltage transmission lines to transmit power for operation and control of the pump station and well fields. Wildlife impacts associated with the establishment of these transmission lines include the potential for inflight collisions with the lines by raptors, particularly when visibility is reduced. Raptor electrocutions on these lines are also a potential impact, although not considered likely to occur due to electrical spacing.

4.1.4.4 Coal Transportation System

Impact ratings associated with impacts on ecological resources associated with the coal transportation system are shown on Figure 4-8.

Due to its permanent nature and difficulty in reclaiming the fill, construction of a new railroad for coal transportation would be a major, long-term impact on soils. A permanent withdrawal of soils from existing and potential uses would occur. Minor impacts are anticipated if the existing NNRy right-of-way is used.

Removal of vegetation for railroad construction, which would affect about 18 acres per linear mile, is considered a long-term impact. Exact location of the right-of-way will determine the specific type of plant communities and species that would be affected.

Railroad corridors primarily traverse northern desert shrub, salt desert shrub, and Mojave Desert communities. Exceptions occur where corridors extend above 6000 feet and pinyon-juniper woodland is encountered. Because the plant communities are well represented, this long-term loss of vegetation is not considered significant. The least amount of disturbance would occur if the existing NNRy right-of-way is used.

The railroad corridors contain or traverse numerous habitats important to wildlife species and, as a result, potential impacts of varying significance can be expected. Sage grouse wintering areas, leks, and brood areas, and ferruginous hawk nesting areas sporadically occur within the railroad corridors. If these habitats are crossed by the railroad, a reduction in the abundance of these species can be expected. Because availability of habitat and seasonal use by pronghorn and mule deer are not limiting herd size, and existing migration routes would not be disrupted, potential impacts to these species from new railroad corridors are considered negligible. Wetlands occurring in the corridors have limited potential to be adversely impacted.

Numerous sage grouse leks occur along the railroad corridor in Clover Valley and disturbance of one or more of these leks is possible. The numerous ferruginous hawk nesting areas and the major bald eagle and golden eagle wintering areas along the railroad corridor in Antelope Valley create the potential for raptor disturbance in response to activities associated with railroad construction and operation. Access roads along railroad rights-of-way would provide vehicular access to new areas, increasing the potential for poaching.

Use of an electrified rail system will create the potential for additional wildlife impacts, including inflight collisions with electric lines, electrocutions, and increased predation. The potential for raptor transmission line collisions will increase, particularly during low visibility and in areas where raptors frequently forage. Raptor electrocutions can be minimized with proper catenary support arm design. This would provide raptors with artificial perches which would be beneficial. However, additional raptor perches would adversely impact sage grouse in Clover Valley by increasing predation on sage grouse.

The development of the coal transportation system may affect habitats for important aquatic species in the County as well as in Elko County, Nye County, and Lincoln County. These impacts would be related to construction and upgrading activities in Clover Valley, White River Valley, Spring Valley, Butte Valley, and Meadow Valley Wash, all of which are inhabited by fish species under consideration for federal listing as threatened or endangered species. The construction of new, or upgrading of existing, railroads will temporarily disturb small amounts of soils adjacent to these habitats. Accelerated erosion due to soil disturbance may reach adjacent springs causing sedimentation and a slight decrease in forage productivity.

4.1.4.5 Threatened and Endangered Species

4.1.4.5.1 Listed Species

Two species listed as endangered and one species officially proposed for listing as threatened have been identified by USFWS as occurring in the WPPP region. The listed species are the bald eagle and Pahrump killifish. The proposed species is the Big Springs spinedace.

Major potential WPPP-related impacts to the bald eagle include unlawful shootings and transmission line electrocutions. Although the bald eagle is federally protected, increased human activity in the County resulting from the influx of the WPPP construction and operation work force will increase the potential for unlawful shootings of bald eagles in the area. (Unlawful shooting is the largest contributor to mortality rates for the bald eagle.) The establishment of low voltage lines associated with the well fields, or an electrified rail system, will also increase the potential for bald eagle electrocution. However, with proper tower design, electrocutions can be minimized. Transmission line towers established in treeless valley bottoms would benefit bald eagles by providing perches for observing prey species over a wide radius and for more efficient use of air currents for flight. An additional impact associated with the power transmission system includes the potential for collisions with wires and towers, especially during periods of poor visibility.

Pahrump killifish inhabit the Shoshone Ponds of Spring Valley. As discussed in Section 4.1.4.3, the extraction of groundwater from sources associated with the Shoshone Ponds could potentially result in alteration of the water level and temperature within these ponds which provide essential habitat for the Pahrump killifish.

Big Springs spinedace exist in a single habitat, Meadow Valley Wash, in Condor Canyon northeast of Panaca, Nevada. This habitat has been proposed by USFWS as Critical Habitat. If the existing railroad, which extends through Condor Canyon and Meadow Valley Wash, were upgraded there would be temporary disturbance to small amounts of soil. Accelerated erosion due to the soil disturbance may reach Big Springs spinedace habitat causing sedimentation and a slight decrease in forage productivity.

The White Pine spinedace habitats are primarily confined to springs in the vicinity of Preston and Lund, including Arnoldsen Spring, Cold Spring, Nicholas Spring, Preston Big Spring, Lund Town Spring, and Flag Springs. The last three areas have been proposed to be critical habitat for the White River spinedace. Construction activities associated with WPPP transmission lines and railroad could result in sedimentation which may drain into White River spinedace habitat.

White River springfish inhabit warm springs in northern White River Valley near Preston and Lund. Known habitat includes Arnoldsen Spring, Cold Spring, Indian Spring, Lund Town Spring, Preston Big Spring, Preston Town Spring, and Ash Springs. Ash Springs has been proposed as a critical habitat for White River springfish. Construction activities associated with WPPP transmission lines and railroad could result in sedimentation in the springs and a slight decrease in food production.

4.1.4.5.2 Candidate Species

Twelve fish species, six terrestrial wildlife species, and nine plant species within the WPPP region are under review by USFWS for consideration as threatened or endangered (Section 3.1.4.6). Potential impacts to plant species would occur primarily during construction. The Bonneville (Utah) cutthroat trout, relict dace, ferruginous hawk, long-billed curlew, and white-faced ibis are the only candidate species with the potential to be adversely affected by WPPP activities. Impacts to the remaining species would primarily be associated with railroad and transmission line construction activities and should be minor and short-term.

Direct WPPP-related impacts to the transplanted Goshute Creek and Pine Ridge Creek population of Bonneville

(Utah) cutthroat trout should be negligible. However, possible indirect impacts, such as increased angling pressure created by the construction and operation work force, could adversely affect both populations. Stream-dwelling cutthroat trout are vulnerable to angling pressure, and unregulated or unrestrained exploitation could suppress the reproducing sector of the population to an unrecoverable level.

Potential impacts to the relict dace include alteration of habitat within the springs, ponds, and intermittent lakes resulting from reduced groundwater supplies. Limited relict dace populations occur throughout Ruby Valley, Butte Valley, Goshute Valley, Spring Valley, and Steptoe Valley, and the disturbance of isolated habitats in one valley would probably not jeopardize the continued existence of the species. This, however, does not preclude the implementation of measures designed to preserve existing habitat potentially affected by groundwater withdrawal in Butte Valley, Steptoe Valley, or Spring Valley. Any reduction of population numbers or habitat could justify listing the relict dace as threatened or endangered.

Potential impacts to ferruginous hawks could result from human encroachment and include increased nest disturbance by curious observers and increases in unlawful shooting. Development of low-voltage transmission lines will also increase the potential for collision and electrocution of ferruginous hawks.

Preferred habitat of the long-billed curlew consists of annual grasslands which have been reduced due to continuing irrigation and cultivation. Potential WPPP-related impacts to the long-billed curlew include additional reductions of preferred habitat associated with WPPP construction activities.

The white-faced ibis nests in marshy or wetland areas and, when water sources for these marshes are reduced or altered, nesting activities decline. Groundwater withdrawal in Spring Valley and North Steptoe Valley for WPPP use may affect associated marshes or wetlands suitable for white-faced ibis nesting habitat.

4.1.4.5.3 Biological Opinion

Formal consultation pursuant to Section 7 of the Endangered Species Act of 1973 was initiated with USFWS on December 16, 1983 (Case Number 1-5-84-F-12). The biological opinion was included in the letter dated March 15, 1984 from the Regional Director of USFWS, Region I.

It is the biological opinion of USFWS that construction and operation of WPPP at the Spring Valley Site is likely to jeopardize the continuied existence of the listed endangered Pahrump killifish. Construction and operation of the railroad in the alternative corridor in Condor Canyon will detrimentally affect the proposed threatened Big Springs spinedace.

It was also the biological opinion of USFWS that construction and operation of WPPP at the Butte Valley Site or the North Steptoe Valley Site (including lineal facilities associated with these sites) is not likely to jeopardize the continued existence of any listed species.

4.1.4.6 Mitigation

Although some impacts are irreversible, effective mitigation planning can reduce the magnitude of impacts to ecological resources. Reclamation of areas cleared during construction will reduce the duration of impacts to soils, vegetation, and wildlife species. The following actions could mitigate potential impacts to soils and vegetation:

a. Where feasible, WPPP facilities could be located on areas with the least productive soils and vegetation. For example, Saline Bottom and Saline Meadow ecological sites could be avoided.

b. Topsoil could be salvaged and stockpiled during construction for later reclamation use. Where feasible, stockpiled soil could be seeded and fertilized to reduce erosion losses.

c. The inclusion of native species in the revegetation seed mix could help establish a viable vegetative cover that provides wildlife habitat as well as livestock forage and help reduce the amount of time needed to offset soil and vegetation losses. Fertilizer and soil amendments that neutralize salinity could assist with soil development and vegetation establishment.

d. Areas susceptible to erosion, such as steep slopes beneath transmission line towers, could be reinforced or otherwise shored-up and revegetated as quickly as possible to reduce soil loss. Surface stability could be increased in certain areas by using erosion control mats, nets, or other soil-binding mechanisms.

e. Railroad rights-of-way and transmission tower footings could be located outside areas of known distributions of candidate plant species to minimize construction impacts.

f. Strategic barriers and warning signs could help prevent unauthorized entry to rangelands.

The low grazing capacity of the rangelands on which halogeton invades precludes control measures costing even a few cents per acre because the cost would be economically prohibitive to the livestock producer. Effective mitigation of halogeton includes: 1) restricting all rangeland soil disturbances to an absolute minimum; and 2) preventing livestock from grazing infested areas when the livestock are most susceptible to poisoning, or when halogeton is in the most toxic growth stage. The halogeton problem could be mitigated by strict adherence to the first item above, and by the prompt seeding of adapted, aggressive species to prevent the growth and spread of halogeton.

Site-specific impacts to terrestrial wildlife involves minor losses of wildlife habitat which will not significantly impact existing wildlife populations. However, significant impacts to terrestrial wildlife are primarily associated with transmission lines, railroads, well fields, water conveyance pipelines, and accompanying access roads. The following actions could mitigate potential impacts to terrestrial wildlife:

a. Increased enforcement of laws protecting the federally listed bald eagle and the ferruginous hawk from poaching would reduce raptor losses.

b. Selecting transmission line corridors and access roads less likely to affect sensitive species, locating the route within the selected corridor to avoid nesting areas, and curtailing construction activities near nests and during nesting seasons would reduce raptor impacts.

c. Employing adequate engineering design practices for low-voltage transmission lines or the electrified railroad would reduce electrocutions of bald eagles, ferruginous hawks, and other raptors.

d. Water could be provided to areas near well fields and along pipeline routes where water supplies for deer and pronghorn are inadequate.

The major potential impacts to aquatic species are primarily related to groundwater withdrawal and increased angling pressure on vulnerable species. The following actions could mitigate potential impacts to aquatic species:

a. Maintenance of the existing conditions of Shoshone Ponds, and possibly identifying additional suitable habitat for establishing new Pahrump killifish populations could reduce impacts, and could also contribute to improving the current population.

b. Closure of Goshute Creek or Pine Ridge Creek to fishing during construction, and enforcement of special regulations by NDOW during WPPP operation, could minimize impacts from increased angling pressure on the Bonneville (Utah) cutthroat trout. (Complete enforcement of stream closure or special regulations is frequently infeasible, and further mitigative procedures, such as assisting in the establishment of additional cutthroat trout populations in streams identified by NDOW for population expansion, may be necessary.)

c. Modified NDOW stocking programs could offset impacts created by increased angling pressure on lakes and reservoirs.

4.1.5 Cultural and Paleontological Resources

The following sections include a comparative evaluation of the probable effects on cultural resources and paleontological resources due to construction and operation of WPPP. Also included is a generic discussion of mitigative measures that could offset these effects. The evaluation involved the review of baseline data and the application of cultural resource and paleontological rating systems.

4.1.5.1 Power Generation System

4.1.5.1.1 Butte Valley Site

Cultural resource site density on the Butte Valley Site is low with a definite emphasis on smaller task sites. Sites are more prevalent in the southern portion of the Butte Valley Site, on the flatter alluvial areas between the hills to the west and the playa to the northeast. No sites dating to the Pre-Archaic Period were observed. Historic period sites are more abundant with most relating to ranching activities, particularly sheepherding.

Linear transformation of survey data suggests that as many as 34 cultural resource sites may exist on the Butte Valley Site. The quantity of data is low, due to the small size of the sites and the variety of data is moderate. The absence of complex sites indicates that sites in the area can be readily mitigated if necessary. Cultural resources on the site appear to have only a limited research potential. The Butte Valley Site is the least sensitive of the three WPPP sites and has a moderate potential for cultural resources impacts.

The Butte Valley Site is mostly on Quaternary alluvial sediments of low paleontological potential. If fossils are encountered, they will occur in the extreme northwest corner of the site. To date, no fossil localities from that area have been recorded. The Butte Valley Site, therefore, has a low potential for paleontological resource impacts.

4.1.5.1.2 North Steptoe Valley Site

The North Steptoe Valley Site has more recorded cultural resource sites than the other two WPPP sites. Sites date to a variety of periods and, with one exception, are all prehistoric in age. Many of the sites are small and diffuse in nature. Baseline data suggest that site density is highest in areas dominated by sand dunes and low hummocks and lowest in hardpan and alluvial areas. Dunes are found in a broad band running diagonally through the North Steptoe Valley Site from northeast to southwest. Hardpan and playa areas occur in the northwest corner of the site. Site density on the alluvial fans and piedmont in the southeast corner is moderate.

Linear transformation of survey data results suggests that as many as 177 sites may exist on the North Steptoe Valley Site. The quantity and variability of data is high due to the number of sites, the moderate abundance of field and base camp sites, and the number of periods represented. The number of base and field camp sites and their dune context, which could involve buried sites, may require a somewhat involved mitigation program. Data integrity is high and the research potential of the area is high. The North Steptoe Valley Site is the most sensitive of the three WPPP sites and has a high potential for cultural resource impacts.

The North Steptoe Valley Site is on sediments mapped as Quaternary alluvium and playa deposits. No fossil localities have been recorded in the area, and the impact potential on paleontological resources is low.

4.1.5.1.3 Spring Valley Site

With one exception, all recorded cultural resource sites on the Spring Valley Site are located along its eastern edge. Most are prehistoric in age and all prehistoric periods except Pre-Archaic are represented. Observed site density falls between that recorded on the other two WPPP sites. Of interest is the number of large base camp sites found. The quantity and complexity of the data contained in these sites will be fairly high.

Linear Transformation of survey data suggests that as many as 93 cultural resource sites may exist on the Spring Valley Site. The Spring Valley Site has high research potential, primarily due to the presence of large base camps representing three separate cultural periods. Resource site density is moderate, but integrity tends to be somewhat lower than in the other two WPPP sites due to more intensive agricultural activities. The Spring Valley Site has a moderate potential for cultural resource impacts.

The Spring Valley site lies entirely within an area mapped as Quaternary alluvium, and no fossil localities have been recorded to date. The impact potential on paleontological resources is low.

4.1.5.2 Power Transmission System

The potential for impacts on cultural resources from construction of a transmission line on corridor segments associated with the three WPPP sites is shown on Figure

4-9. Similar information related to paleontological resources is included on Figure 4-10.

Transmission corridor segments in Spring Valley, Dry Lake Valley, and Egan Basin include areas of high site density. The latter has been identified as an area which may have significance for Native American communities.

4.1.5.3 Water Supply System

The potential for impacts on cultural resources from construction of the water supply system associated with the three WPPP sites is shown on Figure 4-11, Figure 4-12, and Figure 4-13. Similar information for paleontological resources is shown on Figure 4-14, Figure 4-15, and Figure 4-16.

Most of the well fields are situated in low to moderate site density zones with a low potential for significant sites. The pipeline corridor through Egan Basin includes areas of high site density. In addition, the area has been identified as an area which may have significance for Native American communities.

Springs near well fields and pipeline corridors in the northern part of Steptoe Valley may have archaeological deposits as well as Native American significance.

4.1.5.4 Coal Transportation System

The potential for impacts on cultural resources from construction of a railroad on corridor segments associated with the three WPPP sites is shown on Figure 4-17. Similar information related to paleontological resources is shown on Figure 4-18.

Most of the railroad corridors are situated in low to moderate potential areas for NRHP significant sites. The Nevada Northern Railway Depot is on NRHP site. The NNRy rolling stock has been nominated for NRHP status. Impacts along the NNRy right-of-way may increase if the railroad is upgraded. Historic facilities not yet identified along the right-of-way may be affected.

The Bristol Wells Townsite NRHP site is adjacent to a railroad corridor segment. In addition, edges of Spring Valley and White River Valley indicate the potential for dense prehistoric and/or historic sites including significant sites.

4.1.5.5 Mitigation

4.1.5.5.1 Memorandum of Agreement

The framework for identifying cultural resources, recommending preservation or mitigation by scientific data recovery, carrying out Native American consultations, and continuing the managment of significant cultural resource properties is a comprehensive cultural resources plan and a Memorandum of Agreement (MOA). The MOA sets out the principles and responsibilities to be assumed in developing and carrying out the plan. The MOA is an agreement between the BLM, the Advisory Council on Historic Preservation (ACHP), and the Nevada State Historic Preservation Officer (SHPO). WPPP is also a party to the signing.

The MOA is currently being negotiated. The MOA will include the following stipulations:

a. The BLM will ensure that the following measures are carried out for all areas affected by WPPP:

- The BLM will develop a plan for the identification, evaluation, and treatment of historic and cultural properties within the area of environmental impact of WPPP. The plan will be developed in consultation with the SHPO and other interested parties (e.g., cultural resource professionals, Native Americans, and local governments) identified by the BLM.

- The BLM will submit the plan, together with the comments of the SHPO and any other interested parties, to the ACHP. The ACHP will provide the BLM with its comments within 30 days of receipt of the completed plan and comments.

b. The plan will include methods to identify sites or areas of cultural significance to Native Americans and a mechanism providing for consultation with affected Native American groups about proposed treatment of any such culturally significant sites affected by WPPP.

c. The plan will detail the methods and techniques to be employed to protect sites in the environmental impact area of WPPP that will not be directly affected by it. The plan will also specify the nature of post-construction phase management for all sites in the plan.

The WPPP will ensure that the plan is implemented by:

a. Identifying a liaison responsible for working with the BLM.

b. Ensuring that all facilities are designed with sufficient lead time, coordination, and with consideration of feasible alternatives to assure avoidance or minimization of adverse effects to historic properties.

c. Developing and implementing public and worker awareness programs on the value of historic properties.

d. Implementing the post-construction phase management of historic properties.

When completed, the cultural resources plan will be submitted to the ACHP for review. The plan, which will emphasize in-place preservation, will include a systematic survey and research approach to guide preservation and any data recovery efforts which may become necessary.

The cultural resources plan (including research and survey design) will address: 1) standards for site identification; 2) testing, evaluation, and protection or data recovery; 3) emergency site discovery procedures; 4) control of indirect impacts; 5) responsibilities for monitoring and compliance; 6) project review and project design refinement procedures; and 7) other aspects of the cultural resources program.

There is no similar detailed legal and procedural structure for the consideration of WPPP effects on paleontological resources and Native American interests. Draft guidelines dealing with paleontology have been developed for the BLM, and the National Park Service has issued guidelines on the treatment of Native American interests in specific matters. Avoidance and protection are proposed as the preferred policy when such sites are located. Some sites of cultural significance to Native American communities may also be eligible for NRHP consideration and will receive appropriate treatment. When this is not possible, paleontological resources and sites of concern to Native Americans will be managed in a manner procedurally similar to that employed for cultural resources.

Various pieces of legislation address the issue of Native American consultation during the preparation of major environmental statements. In order to ensure early identification of potential Native American concerns with regard to the WPPP, letters were sent to Indian groups in eastern Nevada. This program of consultation will be continued to ensure full participation during project effect and mitigation negotiations. Access to identified Native American traditional use areas will be considered during these negotiations.

4.1.5.5.2 Generic Mitigation

It is anticipated that development on the WPPP site will have the greatest effect on cultural resources due to the size of the site, the difficulty of avoiding cultural resource sites through project design, and the long-term nature of the effect. Generic mitigative measures which will be a part of the comprehensive plan formulated under the MOA include the following:

a. Conduct a Class III intensive survey (to BLM standards) of selected site area.

b. Determine NRHP eligibility of identified resources in accordance with established procedures.

c. Develop a data recovery plan for significant resources in the site area.

d. Implement data recovery program.

e. Report the data recovery program in a professionally acceptable and timely manner.

f. Prepare a document for public distribution that presents the findings of the survey and data recovery.

In addition to direct impacts on cultural resources, there will also be indirect effects on resources in the surrounding area, primarily due to the increased number of people living and working in the area and improved access to areas with archaeological resources. Generic mitigative measures for indirect effects will also be included in the MOA.

Dispersed effects are anticipated as a result of off-site activities (e.g., borrow pits, construction yards, and community improvement projects directly related to WPPP). All such areas will be surveyed according to BLM Class III standards. Primary emphasis will be placed on the avoidance of all resources discovered. Should avoidance be deemed inadvisable, the NRHP eligibility of the resource will be determined, consultation with necessary parties undertaken, a mitigation plan approved, and the mitigation performed.

Generic mitigative measures associated with lineal facilities include the following:

a. Conduct a Class III intensive survey (to BLM standards) of the selected corridor routes.

b. Develop an avoidance plan whereby resources in the corridors are not impacted by tower or access road construction.

c. If impossible to avoid a resource, determine its NRHP eligibility, develop a data recovery program, consult with all appropriate agencies, and implement the data recovery program.

d. Report the survey and data recovery activities in a professionally acceptable and timely manner.

If the NNRy right-of-way is used, the present rail bed (to be upgraded) should be traveled in order to identify features or associated sites that date to the period during which the route was constructed. A limited intuitive survey should also be conducted of areas adjacent to the route where resource denisty is known or suspected to be high.

The NNRy, as an entity, is eligible for the NRHP. For planning purposes, however, it is necessary to define the most essential elements of that entity. A NRHP nomination should be prepared for the NNRy which clearly spells out those portions of the total system that are the most vital in documenting its technological and historical role in the County. This would provide a baseline against which to assess the significance of sites or features found along the path of the existing rail bed. For those deemed significant, a mitigation program could be developed, consultation undertaken, the plan implemented, and the results reported in a professionally acceptable and timely manner.

4.1.6 Visual Resources

The introduction of WPPP will add new elements to the existing landscape, with the potential to alter aesthetics or visual character. These facilities will be constructed on public lands which, as required by FLPMA, must be managed in a manner that protects scenic values.

The assessment of potential visual impacts was based on two separate methodologies. The first methodology is typically employed by Dames & Moore on similar projects. The second methodology is the VRM program developed by the BLM and discussed in Section 3.1.6.2.

The basis of the Dames & Moore methodology is the derivation of visual sensitivity ratings (ranging from minimum to maximum) for each proposed major facility. Additional consideration is given to the expected number of potential viewers of the facility and to any landscape which has outstanding or unusual visual appeal.

The basis of the VRM program is the assignment of management classes to the landscape potentially affected by the proposed facility. Each proposed facility is evaluated based on conformance or nonconformance to guidelines established by the BLM according to the management class assigned to the landscape containing the facility. The WPPP Generating Station, due to its prominence in the landscape, is evaluated by completion of visual contrast rating worksheets. These forms (included in the Visual Resources Baseline technical report) describe the degree of contrast the facility would introduce into the landscape from key viewing locations and recommend mitigative or stipulative measures to reduce potential contrast.

The following sections describe the expected impacts on visual resources, based on both methodologies, and mitigative measures that could be used to reduce the impacts.

Information related to the visibility impact of plumes is included in Section 4.1.2.3.4.

4.1.6.1 Power Generation System

The following sections discuss visual resource impacts using both visual sensitivity ratings (Dames & Moore methodology) and VRM conformance (BLM methodology) for the WPPP Generating Station located at the three WPPP sites. The viewshed associated with these sites is shown on Figure 4-19. Visual sensitivity ratings for the three WPPP sites are listed on Table 4-5.

4.1.6.1.1 Butte Valley Site

Based on the information included in Table 4-5, the derived visual sensitivity rating (Dames & Moore methodology) at the Butte Valley Site is moderate. The Butte Valley Site is located in a natural landscape containing relatively few man-made modifications. Such modifications are limited mainly to dirt roads, wells, and a telephone line in the southern portion of the valley. Therefore, introduction of the WPPP Generating Station would alter existing landscape conditions.

Although the WPPP Generating Station would alter the natural landscape condition, the absence of residences, highways, and recreational areas would severely restrict the number of affected viewers. Permanent residents within the viewshed would be limited to a few families occupying ranches in Butte Valley. Travel on dirt roads within the valley is light, often less than ten vehicles per day. Therefore, the WPPP Generating Station would have a visual impact of moderate significance.

The Butte Valley Site is located in a landscape designated as VRM interim Class 3 (BLM methodology). VRM

Class 3 guidelines state that, although any contrast introduced by the facility may be evident, it should remain subordinate to the existing landscape.

Conformance of the WPPP Generating Station was evaluated by estimating the amount of visual contrast to be introduced. Based on observations made during a field visit to the Butte Valley Site, a VRM visual contrast rating worksheet was prepared.

The landscape surrounding the Butte Valley Site is characterized by a gently-sloping valley floor ringed by angular dissected mountains. Vegetation, primarily scrub and brush, is low in profile and green, gray-green, and yellow in color. Texture of vegetation ranges from coarse in the foreground to smooth in the background. Man-made structures within the landscape are limited to dirt roads and a water well and are minor parts of the visual landscape.

The WPPP Generating Station would introduce generally moderate changes in existing land and vegetative elements, caused by grading, removal of natural vegetation, and land exposure. The WPPP structures would strongly contrast with the existing visual character of Butte Valley. The contrast created by WPPP structures is rated at 30. BLM guidelines state that in any Class 3 area, the maximum allowable element (form, line, color, or texture) contrast is a moderate rating, and the maximum feature (land/water body, vegetation, or structures) contrast rating is 16. Therefore, WPPP structures would result in a significant visual impact.

The VRM Class 3 designation within Butte Valley is interim because detailed scenic quality and user sensitivity analyses have not yet been undertaken by the BLM. Based on a comparison of the scenic quality and visual exposure of the valley with other areas in east-central Nevada, the designation is conservative. Butte Valley resembles other Class 4 areas in scenic quality and diversity and is subject to minimal visual exposure by residents or travelers. Therefore, a full VRM analysis of Butte Valley would probably result in adoption of a Class 4 designation, rather than Class 3. In such a case, a maximum structural contrast rating of 20 would be allowed (rather than the more restrictive 16 applied to Class 3 areas). However, VRM guidelines would still be exceeded.

4.1.6.1.2 North Steptoe Valley Site

Based on information included in Table 4-5, the derived visual sensitivity rating (Dames & Moore methodology) at the North Steptoe Valley Site is high. The landscape, characterized by a natural dominance condition, contains minor man-made modifications, including U.S. Highway 93, other local roads, transmission and telephone lines, and structures in the small community of Cherry Creek.

The WPPP Generating Station would be visible to a number of viewers. Population exposures may occur in a background context to persons living in scattered ranch houses in and near the community of Cherry Creek. The population of Cherry Creek is less than 100 persons. Population exposures may occur in a foreground/middleground context to travelers on U.S. Highway 93. The 1980 ADT volume along U.S. Highway 93 near the North Steptoe Valley Site was 620 vehicles. The 1980 ADT volume on Cherry Creek Road west of U.S. Highway 93 was 65 vehicles. The WPPP Generating Station may be faintly visible from either the Pony Express Trail or Fort Schellbourne historic site at U.S. Highway 93, but only in a background context. It also would be visible to recreationists in the Cherry Creek Range and the Goshute Canyon WSA.

The North Steptoe Valley Site is located in a landscape designated as VRM interim Class 3 (BLM methodology). Based on observations made during a field visit to the North Steptoe Valley Site, two visual contrast rating worksheets were prepared. The greatest contrast of the WPPP Generating Station would occur from U.S. Highway 93 at the eastern edge of the site where most facilities would be located within two miles from observers. Therefore, the following discussion of contrasts applies only to this observation point.

The landscape surrounding the North Steptoe Valley Site, as viewed from the highway, is characterized by a gently-sloping valley bounded on the south and east by overlapping pyramidal, dissected mountains. Vegetation in the valley is primarily scrub, brush, and grasses. It is low in profile and gray-green in color, with some streaks of yellow. Some irregular banding in the form of vegetation occurs due to changes in composition in the background. Texture of vegetation ranges from tufted in the foreground to smooth in the background. From the viewpoint, the highway is the only apparent visible man-made structure.

The WPPP Generating Station would introduce generally moderate changes in existing land and vegetative elements, caused by grading and removal of natural vegetation. WPPP structures would strongly contrast with the existing visual character of the North Steptoe Valley. The contrast created by WPPP structures is rated at 30. BLM guidelines state that, in any Class 3 area, the maximum allowable element contrast is a moderate rating, and the maximum feature contrast score is 16. Therefore, WPPP structures would result in a significant visual impact.

The VRM Class 3 designation within North Steptoe Valley is interim because detailed scenic quality and user sensitivity analyses have not yet been undertaken by the BLM. Based on a comparison of the scenic quality and visual exposure of the northern part of Steptoe Valley with other areas in east-central Nevada, the designation is conservative. The northern part of Steptoe Valley resembles other Class 4 areas in scenic quality and diversity and is subject to a relatively low level of visual exposure by residents and travelers. Therefore, a full VRM analysis of the area probably would result in adoption of a Class 4 designation, rather than Class 3. In such a case, a maximum structural contrast of 20 would be allowed (rather than the more restrictive 16 applied to Class 3 areas). However, VRM guidelines would still be exceeded.

4.1.6.1.3 Spring Valley Site

Based on information included in Table 4-5, the derived visual sensitivity rating (Dames & Moore methodology) at the Spring Valley Site is high. The landscape, characterized by a natural dominance condition, contains minor man-made modifications, including U.S. Highways 93 and 6/50, other local roads, telephone lines, fences, and scattered ranches.

The affected portion of Spring Valley is one of high scenic quality. Wheeler Peak (13,063 feet), located in the Snake Range east of the site, provides a scenic backdrop to Spring Valley to travelers on U.S. Highway 93 and Highway 6/50 at Connors Pass. The WPPP Generating Station would significantly reduce the quality of those views. In the vicinity of Majors Place junction, the 1980 ADT volume was 515 vehicles traveling east on U.S. Highway 6/50, 875 north on U.S. Highway 93, and 440 south on U.S. Highway 93. The WPPP Generating Station would also be visible to recreationalists in the vicinity of the Wheeler Peak Scenic Area.

The Spring Valley Site is located in a landscape designated as VRM Class 4 (BLM methodology). According to VRM guidelines, any contrast introduced into a Class 4 landscape may be dominant and attract attention, but should repeat the form, line, color, and texture of the characteristic landscape.

Based on observations made during a field visit to the Spring Valley Site, three visual contrast rating worksheets were prepared. The worksheets were completed from three observation points. The greatest contrast of the WPPP Generating Station would occur from U.S. Highway 93 at the western edge of the site. Therefore, the following discussion of contrasts applies only to this observation point.

The landscape surrounding the Spring Valley Site, as viewed from the highway, is characterized by a flat valley bounded on the east by an abruptly rising, precipitous mountain range. Vegetation in the valley, primarily scrub and brush, is low in profile, gray-green in color, and forms some irregular bands. Texture of vegetation ranges from stippled and tufted in the foreground to smooth in the background. Visible structures include Highway 93, telephone poles and wires, and low wire fences.

The WPPP Generating Station would introduce generally moderate changes in existing land and vegetative elements due to grading and removal of natural vegetation. WPPP structures would strongly contrast with the existing visual character of Spring Valley. The contrast created by WPPP structures is rated at 30. BLM guidelines state that in any Class 4 area, the total contrast rating for any feature should not exceed 20. Therefore, WPPP structures would result in a significant visual impact.

4.1.6.2 Power Transmission System

The transmission line corridors cross landscapes primarily in natural and natural dominance conditions. Visual sensitivity ratings (Dames & Moore methodology) based on landscape condition and visual exposure are shown on Figure 4-20. Because any segment of the power transmission system might be seen under different viewing situations, the worst-case sensitivity rating for each segment is shown on Figure 4-20.

The number of potential observers of the WPPP facilities would be limited mainly to transitory viewers traveling on major highways. Visual impact ratings would be greatest (maximum rating) where corridors cross highways, resulting in foreground, open superior views to travelers on the highway. However, such views would be of relatively short duration and would affect limited numbers of people.

Visual impact ratings are also moderate to high where the transmission system would be visible to persons recreating in scenic areas or WSAs. The transmission system associated with the Spring Valley Site would impair the scenic quality of the south-central Spring Valley, west of Wheeler Peak. It would also be visible to recreationists in the Mount Grafton and North Creek scenic areas, resulting in high impact ratings.

The transmission line corridors cross lands predominantly classified as VRM interim Class 3, Class 3, and Class 4. Approximately four miles of corridor crosses Class 2 lands. VRM guidelines state that contrasts introduced into Class 3 lands should remain subordinate to the existing landscape. It is expected that with careful local alignment selection near potentially sensitive viewing locations e.g., major highways), transmission towers can be placed so that background mountains form a backdrop. This local alignment strategy can help keep towers and lines subordinate to the overall landscape, or at least minimize visual impacts to key viewing locations.

4.1.6.3 Water Supply System

The water supply system well fields and corridors are located in natural dominance landscapes. Worst-case visual sensitivity ratings (Dames & Moore methodology) are summarized in Table 4-6. The Butte Valley and Spring Valley systems are rated low in sensitivity, while the Steptoe Valley system is rated minimum.

The pipeline corridors cross lands classified as VRM interim Class 3 and Class 4 (BLM methodology). Because of the low profile nature of pumps, wells, and valves, and the fact that pipelines will be buried underground, it is expected that the water supply system would remain subordinate to the surrounding landscapes. Therefore, the system would conform to VRM Class 3 and Class 4 guidelines.

4.1.6.4 Coal Transportation System

The coal transportation system includes both existing railroads and a new railroad connecting the WPPP Generating Station to existing facilities. Because the railroads would be ground level facilities, the discussion of visual sensitivity is qualitative and no sensitivity ratings were derived (Dames & Moore methodology).

The railroad corridors cross landscapes in natural and natural dominance conditions. Within flat valleys, the visibility of the railroads would be restricted to about a half-mile distance. Long-range visibility is primarily dependent on vegetative clearing and bed grading performed during rail construction. The low profile of existing vegetation and gentle topographic slope along much of the corridors would reduce the effect of these two elements. However, where the corridor ascends from valley floors through mountain passes, extensive cut and fill may be required. In these cases, the railroad may introduce strong linear forms into the natural landscape. Therefore, the visual analysis emphasizes graded segments.

The number of potential observers of the railroad would be mainly limited to transitory viewers traveling on major highways. The systems would be most visible to those persons where the rail climbs grades or where it crosses highways. Population exposure sources and expected levels of visual impacts for the coal transportation system are listed in Table 4-7.

The preferred Northern Transportation System from the Butte Valley Site would cross Egan Creek Pass, requiring heavy rock cuts. However, this segment, located about ten miles west of U.S. Highway 93, would not be visible from major population sources. The alternate Northern Transportation System would be visible from U.S. Highway 93 at the grade crossing and as the rail loops south of Spruce Mountain. The Southern Transportation System would be visible from U.S. Highway 93, U.S. Highway 6 and U.S. Highway 50 and State Highway 318 where the railroad would approach and cross those highways. The Southern Transportation System from the Butte Valley Site would parallel and be visible from U.S. Highway 93 for approximately 15 miles. For the remainder, the railroad would cross State Highway 38 twice and U.S. Highway 6 and U.S. Highway 50 once. Cut and fill would be required near the crossings at U.S. Highway 6 (Jakes Wash) and U.S. Highway 50, leaving the grades visible from those highways.

The preferred Northern Transportation System from the North Steptoe Valley Site will include approximately five miles of railroad linking the existing NNRy railroad with the site. This segment would not be visible to significant population sources. The alternate Northern Transportation System would require rock cuts through the Antelope Range and would be visible from U.S. Highway 50. The railroad would again be visible from U.S. Highway 50 at the road grade crossing approximately five miles north of the site.

The Southern Transportation System from the Butte Valley Site would be visible from U.S. Highway 93 which it would parallel and cross north of Pioche. Heavy sidehill cuts and fill north of Dutch John Mountain and through Muleshoe Pass would not be visible to motorists on U.S. Highway 93. Within the pass between Cave Valley and Lower Steptoe Valley, the railroad would cross between the South Egan Range WSA and the Mount Grafton WSA. In this area, the railroad may be visible to recreationists in a background context. The railroad would again cross U.S. Highway 93 in two spots, north and south of Ely. The alternate Southern Transportation System would parallel and be visible from a portion of U.S. Highway 93. The railroad would cross U.S. Highway 6 and U.S. Highway 50 and may be visible in an inferior position from U.S. Highway 50 in the vicinity of the site.

The preferred Northern Transportation System from the Spring Valley Site would require rock cuts through the Antelope Range and near the source of Spring Valley Creek. In these areas, the railroad would cross and/or be visible from U.S. Highway 50. The railroad would cross U.S. Highway 50 again at grade aproximately six miles northeast of the site. The alternate Northern Transportation System is identical along most of its length to the preferred route and would cross U.S. Highway 50 in the locations noted above.

Portions of the Southern Transportation System and its alternate would be visible in an inferior position from U.S. Highway 93.

The coal transportation system will cross lands designated as VRM interim Class 3, Class 3, and Class 4 (BLM methodology). VRM guidelines state that contrasts introduced into Class 3 lands should remain subordinate to the existing landscape. Because it is a ground-level facility, a railroad can be subordinate to its surrounding landscape. Therefore, it is expected that most of the coal transportation system will conform to VRM Class 3 and Class 4 guidelines.

If an electrified railroad were constructed along the NNRy right-of-way, there would be visual impacts associated with the overhead facilities. These impacts would be similar to those of a low-voltage transmission line.

4.1.6.5 Mitigation

Mitigative measures could be employed to reduce the contrast introduced by WPPP to the land and vegetation. Careful grading and landscaping would shield the less prominent facilities to reduce contrast in form, line, color, and texture. This measure could be used at the North Steptoe Valley Site, where the contrast would be apparent from both U.S. Highway 93 and Cherry Creek. Revegetation of grasses and/or shrubs onto disturbed unused areas would reduce color and texture contrasts.

Use of carefully developed color schemes in painting and concrete preparation could substantially reduce contrast in all elements. The materials used in constructing some structures could be mixed or colored in a way that would let them blend more easily into the background landscape.

The above measures would reduce structural contrast to moderate ratings for the elements of line, color, and texture. Due to the prominence of some WPPP structures (including the stacks, steam generator buildings, air quality control system buildings, and cooling towers) it may not be possible to substantially mitigate the contrast in form introduced by those structures. The broad open valley landscape characteristic of the three WPPP sites does not allow opportunities for siting the facilities to reduce visual impacts. Therefore, significant structural contrasts in form and, possibly in line, color, and texture, will lead to unavoidable visual impacts.

With regard to the power transmission system, general mitigative measures could be adopted for the system as a whole. Towers could be painted in low-reflective pigments which would blend with the dark brown color of the natural landscape. Transmission line conductors could also be dulled or painted to decrease reflectivity. Dull colors, non-specular towers, and non-specular wire could be used for those segments assigned moderate, high, or maximum impact ratings on Figure 4-20.

Within its general corridor, the power transmission system could be aligned to take advantage of backdrops and local topographic features to reduce visibility. Towers could be spaced at broad intervals at highway crossings and other points of public exposure.

Most of the water supply system and coal transportation system are expected to remain subordinate to their characteristic landcapes and, therefore, no significant mitigative measures are anticipated.

4.1.7 Socioeconomics

Construction and operation of WPPP will affect the lives and interests of many people, including County residents, transient workers in-migrating from other areas, and visitors passing through the County. Of primary concern to these people, particularly the permanent residents of the County, is that the impacts resulting from construction and operation of WPPP be minimized and that the desirable qualities of the County be maintained.

There are no absolute criteria for measuring the quality of life or adequacy of amenities in a locale and, ultimately, these are subjectively determined. The focus of this discussion is on the degree to which changes in socioeconomic characteristics due to WPPP may cause significant changes in the local environment. A corollary concern is to identify requirements for mitigative measures to avoid adverse long-term impacts and to enhance beneficial effects.

The socioeconomic impacts of WPPP will result primarily from the introduction of new workers and new spending in the County. New population and additional income are the primary causes of change in social structures. These, in turn, generate changes in requirements for private and public infrastructures (i.e., housing, utilities, public health and safety, education, and cultural amenities).

The following sections summarize information related to socioeconomic impacts and proposed mitigative measures. The latter are incorporated in the Impact Alleviation Plan (Section 4.1.7.12.5), developed as part of the WPPP community development program.

4.1.7.1 Employment

4.1.7.1.1 Direct Employment

WPPP will involve two distinct employment and development phases, the construction period and the operation period. Construction is scheduled to commence in the second quarter of 1986 and terminate during the first quarter of 1993. Work force requirements are listed in Table 4-8 and are shown on Figure 4-21. Peak construction employment would occur during the third quarter of 1990 with a total of 2345 persons. Workers associated with operation would begin in the third quarter of 1987, but continue at low levels until major facilities were in place. The majority of the operation work force staffing would occur after 1990, and reach a maximum of 530 persons during the second quarter of 1992. Total employment is estimated to peak at 2610 persons during the first quarter of 1991, when the construction work force begins to decline and the operation work force increases to over 50 percent of the total operation work force requirements.

The work force requirements can be compared to employment forecasts of the County to the year 2000. These data show that, without WPPP, approximately 3200 to 3300 persons (covered by unemployment compensation) would be employed in the County between 1985 and 1990. Work force requirements for WPPP will exceed the local employed work force by approximately 80 percent. The majority of the WPPP work forces will have to be imported.

At the construction peak, the WPPP construction force is estimated to include six percent local daily commuters, 54 percent nonlocal weekly commuters, and 40 percent relocating workers (of which 60 percent would be married and 40 percent would be single status). During operation, the operation work force is estimated to include 20 percent local and 80 percent nonlocal (of which 84 percent would be married and 16 percent would be single status).

During construction, the WPPP labor requirements will greatly exceed the local supply of construction workers, and local businesses may encounter delays in carrying out building projects. Labor turnover on WPPP and stimulation of secondary, or indirect employment, from local construction payroll spending will mitigate temporary shortages in locally-available building skills.

If patterns observed at other large construction projects are indicative, a more general labor shortage may result in the community. This would be due to higher wages paid to WPPP construction workers relative to existing local wage scales which could attract workers from existing jobs in the County. The impact would be short-term and could be insignificant should local workers perceive that returning to their old jobs after WPPP construction ended would be difficult.

4.1.7.1.2 Indirect Employment

The financial stimulus of a large construction project to nearby communities often results in an induced expansion of local business and employment opportunities. Studies of power plant projects in the western states suggest that, during the construction phase, an average of one indirect job results from every five direct jobs on a power plant project in rural areas. During operation, the ratio increases to one to two, due to the more settled nature of the project work force. The ratios are based on the proportion of direct project jobs filled by nonlocal workers who will contribute heavily to changing the equilibrium of local employment and income levels.

Based on the average indirect to direct job ratio of power projects in the western states, it is estimated that a maximum of about 440 new indirect jobs would be generated in the County during peak construction. These indirect jobs, however, will diminish as construction employment decreases. It is anticipated that the majority of the indirect construction period jobs would be filled by local residents, typically unemployed and under-employed people (e.g., spouses, students, and people between jobs). The peak number of indirect jobs to be filled by local residents is projected at 310 (70 percent of the total). The remaining 30 percent (130 jobs) would be filled by in-migrants newly attracted to the area.

During the operation period, indirect employment is estimated to stabilize at one job for every two direct operation jobs, or a total of 215 indirect jobs. The majority of indirect jobs (60 percent) would be filled by local residents, with the balance being filled by relocating in-migrants.

4.1.7.2 Population

Population changes are the principal socioeconomic impacts of a major development project. The impacts are precipitated by changes in local employment as in-migrants relocate their households to the project area, either temporarily during construction or permanently during operation. The population changes in turn affect the area as a whole.

Table 4-9 lists County population projections with and without WPPP for each year of construction and the first year of full operation. At peak construction, it is estimated that 13,733 persons will reside in the County with WPPP compared to 9378 without WPPP. Therefore, at peak construction, there will be 46 percent greater population due to WPPP. This large, but temporary, increase will result from three factors:

a. Nonlocal workers commuting on a weekly basis to the County from other parts of the region and residing in transient accommodations near the WPPP site during the work week.

b. In-migrating nonlocal workers relocating to the County to work on WPPP, settling into more or less permanent housing, and bringing their dependents.

c. In-migrating workers with dependents filling non-WPPP jobs resulting from the economic stimulus of the project.

In addition, WPPP could attract an unknown number of transients, including people unable or unqualified to secure either direct or indirect jobs. Such people would drift in and out of the community from before construction begins until after it ends.

Figure 4-22 shows the projected trends of WPPP-related employment and population from initiation of construction to full commercial operation. The nonlocal weekly commuting and relocating in-migrant personnel will generate population changes, while daily commuters from the local area will be part of the permanent, baseline population.

Table 4-9 indicates that, at full operation, the WPPP-related population increase is estimated to be about 1300 persons, or 14 percent greater than the expected population without WPPP. The largest component of the new population will be due to families of married operating personnel.

4.1.7.3 Income

Table 4-10 details the annual payments and identifies the portions of gross and net payrolls spent within the County. Construction of WPPP will entail direct wage and salary payments estimated to be approximately $200 million. Net local spending in the County is estimated to be approximately $61 million, of which over half is projected to be spent in 1990 and 1991. The operation payroll will gradually expand, reaching a peak during the operation period. Of the estimated annual gross payroll of $13.1 million, about $6.9 million per year is projected to be spent in the County.

Local inflows of spending will add to total local personal income. At the peak of construction, the County will experience an increment of 51 percent over baseline personal income levels (approximately $42 million) due to WPPP-related spending.

4.1.7.4 Housing

The demand for housing will be a primary impact associated with in-migration of WPPP work forces. Because of the importance of mitigating these impacts, a project housing strategy was developed (Section 4.1.7.12.3). Because of the housing strategy, actual housing impacts related to population growth associated with the project will be substantially reduced.

Figure 4-23 shows the cumulative housing demand as a result of WPPP. A heavy demand for housing will occur during the 1987 to 1992 time-frame followed by a decline due to the rapid out-migration of the construction work force after 1992.

The peak demand for housing is expected to occur in the second quarter of 1991. The temporary housing demand is expected to reach approximately 2100 by late 1990, and the permanent housing demand will reach approximately 500 by 1992.

Temporary units will be required to accommodate construction workers for approximately six years. After construction, the demand for housing should be zero since the work force is expected to leave the area.

The present County housing stock does not provide an adequate supply of excess housing to meet the projected temporary demand, even though the County is experiencing a relatively high vacancy factor due to out-migration associated with decreased mining activities in the area. However, there may be enough excess housing to accommodate the permanent demand of operation workers, although a substantial number of these units are in need of major rehabilitation.

It is anticipated that there will be an adequate number of units in the County to accomodate the WPPP operation work force. Potential impacts will be mitigated by implementing the project housing strategy.

4.1.7.5 Education

The increase in school age children associated with the WPPP population will impact the WPCSD. Table 4-11 summarizes occupancy with and without WPPP by grade level for the peak years of employment and the first year of full operation. Children associated with WPPP work forces are assumed to be enrolled in WPCSD schools although there are several private and parochial schools in the County. Impacts on County educational facilities are significant because of the relatively marginal physical condition of the school facilities and because of the relationship between population growth and school enrollment.

Sufficient capacity exists in the high school to fulfill the needs of both baseline and WPPP-related students during the operation period, although the physical quality of the facility will ultimately require its replacement. The capacity of the junior high school, however, is insufficient to accommodate total projected enrollment with WPPP-related students. The capacities of the elementary schools in Ely are sufficient to accommodate baseline enrollment projections. However, construction and operation of WPPP will necessitate that additional elementary school capacity be developed.

WPCSD staffing needs will also increase due to WPPP. There will be a permanent need for 20 more teachers, with twice the number needed at the peak of construction. About the same number of support staff will be necessary in each case.

4.1.7.6 Public Health and Safety

4.1.7.6.1 Law Enforcement

Law enforcement needs due to WPPP are summarized in Table 4-12. A total of two new police officers will be required during the operation period. At the construction peak, nine new officers will be required. There will also be impacts on custodial facilities. Both the County jail and the juvenile detention center will require relatively substantial expansion, especially during WPPP construction.

4.1.7.6.2 Fire Protection

The existing fire station is located on the west side of Ely. It is anticipated that most of the population growth will occur along the McGill Highway or the Pioche Highway, outside the satisfactory response time. A new station or substation in East Ely is anticipated to reduce the response time to the above areas and still provide adequate service to the west side of Ely, thereby mitigating these impacts.

The WPPP site will have its own fire protection services. However, in emergency situations, assistance will be needed from various local fire departments. On a localized level, and depending on the location of housing, existing water distribution systems may have to be expanded or otherwise improved.

4.1.7.6.3 Health Services

Public health services needs due to WPPP are summarized in Table 4-13. The projections in this table indicate that long-term impacts related to WPPP will occur in the areas of nurses and paramedical personnel. WPPP will also generate a need for two more ambulances (over the four now in the County) at the peak of construction. WPPP will not significantly impact existing in-patient facilities.

4.1.7.6.4 Social Services

Based on comparison of current case load per staff service level with projected service levels, the principal impacts on the delivery of social services in the County will occur during peak construction employment. In the area of state and County general welfare, assistance to transients and others needing financial and medical support may significantly increase. This could include support in the form of food stamps and aid for dependent children. Also at the peak of construction, day care needs are projected at about 38 new slots above the 134 slots presently existing in the County. In the area of mental health, counseling hours are expected to increase by more than 50 percent, requiring two additional full-time counselors. Similar impacts are expected on home health care and aging services. At the peak of construction, clients served by public health nurses are expected to almost double, requiring an additional registered nurse.

Because many of the County services are funded by state and federal government budgets, it is difficult to predict whether all social services impacts can be mitigated through conventional funding sources.

4.1.7.7 Community Infrastructure

4.1.7.7.1 Transportation

At the peak of construction, a total of 2570 employees will be on the WPPP site. Assuming that the plant will be constructed on an eight-hour day, five-day-a-week schedule and that the operating and maintenance personnel will be on the same shift as the construction workers, 2570 people will be arriving or leaving the site at approximately the same time (i.e., peak hour). Assuming the construction worker housing units are fully occupied, 1620 people will be commuting from beyond the immediate area of the plant site. Because of the remoteness of the three WPPP sites, approximately 50 percent of the workers are assumed to carpool to the site. Assuming two people per car and no busing or vanpooling, the maximum number of vehicles going to, or leaving, the site would be approximately 1200. In addition, WPPP-related traffic is anticipated to be 60 to 75 trucks per week.

The total workers employed at the site during the operation period will be 530, spread over three, eight-hour shifts per day. The number of vehicles going to, or leaving, the site at any one time should not exceed 200 vehicles.

The additional peak hour traffic generated during WPPP construction could result in a significant temporary impact on portions of the County transportation system. This would depend on the WPPP site and the location of WPPP-related housing. For the North Steptoe Valley Site, capacity constraints on U.S. Highway 93 through McGill are likely to cause peak hour congestion regardless of where in Ely the housing is located. Traffic flow will need to be improved through McGill to accommodate through traffic. This may be accomplished by: 1) constructing a new bypass route; 2) widening U.S. Highway 93, especially in the southern part of McGill; 3) implementing parking restrictions during peak traffic hours; and/or 4) providing two lanes for traffic in direction of peak flow on the three-lane road by use of cones or lights. In addition, increased peak hour traffic through East Ely has the potential to become a safety problem unless improvements are made to the existing intersection of Avenue F, 15th Street, and U.S. Highway 93.

There may be impacts due to local commuter trips (e.g., shopping and school). Improvements to city streets such as paving, striping, signing, and installation of traffic control devices may be necessary. Other alternatives that could mitigate impacts on transportation networks include ride-share programs, flexible or staggered work hours, and van pools.

4.1.7.7.2 Water and Sewer Systems

The combined service capability of the community water storage systems for Ely, McGill, and Ruth is 17,050 persons, which represents a total excess service capacity for 6038 persons in the three communities at peak WPPP employment. The condition of the water and sewer systems is generally poor and may have to be improved or replaced.

4.1.7.8 Recreation and Wilderness

4.1.7.8.1 Recreation

Population entering the County as a result of WPPP will utilize community recreational facilities. However, guidelines used to quantify impacts generally show the number of recreational facilities in the County to be adequate to accomodate population growth. The guidelines do indicate a deficiency in the number of playlots, both with and without WPPP. The guidelines also project some deficiencies in park acreage, basketball and miscellaneous court game areas, and multi-purpose facilities. Table 4-14 summarizes the expected shortfall of facilities by recreation type for the peak year of employment and the first year of full operation, both with and without WPPP. Many of the existing facilities are sub-standard and in need of improvement or replacement.

Non-urban outdoor recreation uses, sites, and facilities will also be impacted by WPPP-related population increases. It is expected that construction and operation workers will utilize local recreational opportunities. The Ely area is isolated and local recreational opportunities are expected to be impacted because of the commuting time/distance/expense to get to other areas.

Angling pressure on the limited fishing areas will increase. Use will likely concentrate on those fishing areas described in Section 3.1.7.8.1. However, WPPP-related use is expected to concentrate on the waters within easiest commuting distance. For CWH facilities located at the North Steptoe Valley Site or Butte Valley Site, areas likely to be impacted are Ruby Lakes, Cave Lake, Illipah Reservoir, and Comins Lake. For the Spring Valley Site, Silver Creek Reservoir would also be impacted. Impacts to fishing will consist of some crowding, more competition for the available fish, and possibly a smaller fish brought to creel since more fish would be caught soon after they are planted. Even without WPPP, there is excessive pressure on the available stock of fish. WPPP-related increase in fishing pressure will aggravate this situation unless additional fish are stocked. Quality of the fishing experience may decline slightly at specific sites. For facilities at the North Steptoe Valley Site, increased fishing pressure could impact the Bonneville (Utah) cutthroat trout in the lower accessible portion of Goshute Creek. Overall impacts to fishing opportunities are not expected to be significant.

Hunting will be impacted by the WPPP-related population increase. There will be increased competition through the big game tag quota system for the already oversubscribed deer, elk, and antelope tags. Impacts to hunting are expected to occur from increased competition for available tags and increased competition for a limited small game resource (such as sage grouse) not limited by quota. Anticipated impacts will negatively impair hunting quality and opportunity to hunt but not to a significant degree.

Poaching of wildlife could also increase. This will indirectly affect hunting opportunities. Poaching is currently a problem in the County. Although construction and operation workers are not necessarily predisposed to poaching, poaching may increase over present levels because: 1) construction transients may have little attachment or concern for the resources in the County; 2) there is only one wildlife law enforcement agent stationed in the County; and 3) there is generally easy access throughout the year to relatively large populations of big game. Although anticipated impacts from poaching cannot be quantified, the current problem is expected to be compounded.

Virtually all accessible areas in the County are now being utilized by recreational and commercial trappers during the winter season. Trappers are generally possessive of their "home range." Some of the people new to the County may participate in trapping. Even a moderate increase in competition for trapping areas would be viewed as a serious negative impact by this activity group.

ORV ownership and use is expected to be popular with the construction workers. Most of the current ORV use in the County is on existing backcountry trails. This situation would be expected to continue. However, additional ORV use will accelerate the current situation of extension of backcountry trails through use and maintenance, and soil and vegetation disturbance from actual off-trail use. The significance of the impact would vary depending on the sites involved.

Currently developed and semi-developed campgrounds in the County are only near capacity on holiday weekends during periods of good weather. It is expected that there will be increased competition for all available developed and undeveloped campsites due to WPPP-related population increases. It is not anticipated that developed and semi-developed sites wil be filled to capacity on a regular basis with the exception of Cave Lake State Park where any additional use will further tax the facilities. The USFS complex of developed and semi-developed campgrounds in Duck Creek Basin could be impacted if WPPP is constructed at the North

Steptoe Valley Site. It may be difficult for both the BLM and the USFS to control "squatters" on public lands who purport to be camping but were attracted to the County in the hope of finding employment. However, this impact is not expected to be significant.

General impacts from increased use could occur to most backcountry recreation activities including backpacking, day hiking, pine nut gathering, Christmas tree collecting, and caving (especially at Goshute Cave). There may be some increase in vandalism, trash, and maintenance and rehabilitation needs. Lehman Caves National Monument will likely receive increased use pressure. Local recreationists will probably recognize some increase in recreation use pressure in their activities. This may result in some crowding, some loss of quality, and additional impacts on the resource. However, in general, impacts are not expected to be significant. More use in most areas for most activities can be absorbed within acceptable limits of impact to the resource and the user's experience. BLM and USFS response to increased use will include monitoring, specifically at front country (accessible by improved road) sites which are susceptible to damage through use and/or vandalism. Because of budget constraints, and the fact that the recreation areas and facilities generally have the capacity to absorb more use, it is unlikely that federal response will include more recreational developments.

4.1.7.8.2 Wilderness

In the BLM WSAs and the USFS potential wilderness, it is expected that there will be some increase in use with some attendant use problems such as crowding and deterioration at specific sites and attractions due to WPPP-related population increases. Increased costs of patrol and site protection and rehabilitation may occur. The BLM and USFS are charged with maintaining the wilderness quality of areas still under consideration until Congress can decide on the wilderness status for the areas.

If WPPP is located at the North Steptoe Valley Site or at the Butte Valley Site, the Goshute Canyon WSA would be the WSA most heavily impacted by WPPP-related population increases. The naturalness of the area would be affected in several ways. Impacts would likely include increased visitor use at Goshute Cave, and possibly increased vandalism to the cave resource. Unpermitted woodcutting may also occur within the boundaries of the WSA. Increased use would affect solitude opportunities. General ORV use and extension of back-country roads through use and maintenance would impair wilderness values. This may especially be a problem within the upper basin. Recreation and solitude opportunities would also be affected. Some crowding at preferred campsites would occur such as at the mouth of Goshute Creek and at springs in the upper basin. Concentrated use of campsites could cause some soil, water, and vegetation degradation, and would adversely affect the quality of the recreation experience. Location and severity of impacts would need to be determined through more intense Interim Management Plan patrol to insure that wilderness values are preserved until Congress determines wilderness status for the area. This would increase BLM monitoring. Costs of signing and maintaining signs to alert the public of WSA status and possible ORV closures may also be borne by the BLM and USFS.

If the Goshute Canyon WSA becomes a wilderness, management costs would increase due to WPPP-related population increases. Management would probably involve a permit system as well as patrol and monitoring.

If WPPP is located at the Spring Valley Site, the Mount Grafton WSA would be the WSA most heavily impacted by

WPPP-related population increase. The same general concerns as listed above for Goshute Canyon WSA would apply. Use would likely be concentrated at North Creek camping area. Again, more intense aerial and on-the-ground Interim Management Plan patrol would be necessary. The USFS Mount Wheeler and Mount Moriah areas may also be impacted in a similar fashion. These areas are still under consideration for possible wilderness designation and many roads and trails lead into these units.

Construction and operation of transmission lines and railroad would cause impacts to sights and sounds to the wilderness experience of users in certain areas. This could impact the feeling of solitude and perception of naturalness.

Construction of transmission lines or railroad through Cave Valley could impact a portion of either the Mount Grafton WSA or the South Egan Range WSA. These facilities could negate wilderness values in a portion of either WSA. The portions potentially impacted are the fringes of the WSAs that neither have high wilderness values nor are essential to the integrity of each prospective unit. However, under current policy, neither transmission lines nor railroads can be built through a WSA.

4.1.7.9 Agriculture and Ranching

Potential impacts on the livestock industry in the County were initially identified during the WPPP community development program. Ranching interests were represented in this program. Two significant agricultural issues that emerged were the potential impact of WPPP on agricultural water resources (discussed in Section 4.1.3.2) and the effect of WPPP on livestock grazing maintenance and management as the result of removing land from forage production. The latter impact is addressed in the following sections in a general manner to allow individual ranchers (permittees), BLM, and WPPP flexibility in determining the extent to which specific mitigative measures to be identified will be necessary and acceptable.

4.1.7.9.1 Land Productivity

Section 3.2.7 discusses the existing land productivity associated with the three WPPP sites and railroad corridors in terms of AUMs. It should be noted that actual impacts could extend beyond the AUMs withdrawn due to impacts on a ranch operation as a whole. However, it is not possible to accurately calculate affected AUMs associated with migratory-type operations until detailed site and corridor work is completed. Field observations by trained range management personnel were used to estimate the percentage of each allotment potentially subject to impact.

Impacts on land productivity are included in Table 4-15. The total potentially affected AUMs due to actual site development is relatively small when compared to the total AUMs on BLM grazing allotments that are leased by individual ranch operations. These AUMs need not be an irretrievable loss. They could be recovered by importation of feed for the livestock or developing areas in each allotment to produce additional forage for the livestock. Therefore, impacts related to AUMs, or land productivity, are anticipated to be insignificant. However, it is recognized that the significance may vary, depending on the detailed use of the affected portions of an allotment. A detailed analysis of AUMs and associated impacts on individuals will be a part of the Impact Alleviation Plan.

4.1.7.9.2 Livestock Management

Impacts associated with the three WPPP sites and railroad corridors are directly related to the change in land use from public rangeland to WPPP use. The impacts extend beyond simple loss of land acreage and its forage productivity value because placement of facilities may also obstruct existing ranch operations in the following ways:

a. The movement and migration of livestock may be restricted.

b. The access to watering places for range livestock may be impaired.

c. The cost of ranch management may be increased.

These impacts are primarily related to railroad corridor development. However, the magnitude of impacts cannot be accurately assessed until the actual route alignment is selected. Mitigative measures that could alleviate corridor-related impacts include:

a. Strategic placement of livestock railroad underpasses.

b. The development of watering places easily accessible to livestock without crossing the railroad.

c. Fencing the railroad right-of-way where livestock will concentrate and be endangered.

Actual mitigative measures applicable to each specific case will be developed as a part of the Impact Alleviation Plan. The agricultural industry part of the Impact Alleviation Plan is discussed in Section 4.1.7.12.5.

4.1.7.10 Economic Benefits

In addition to income from payrolls discussed in Section 4.1.7.3, economic benefits, as a result of construction and operation of WPPP, will result from the payment of state and local taxes during the construction period (6 years) and operation period (36 years). The major sources of tax revenue will be sales taxes on construction purchases and coal purchases and in lieu of ad valorem taxes on the assessed value created.

Estimates of tax revenue were calculated using computer models developed specifically for WPPP. The models assumed constant 1983 dollars, constant growth rates for Nevada and its counties, 100 percent County ownership of WPPP, and the Nevada tax structure in existence in 1983. The models did not compute the stimulative effects of WPPP, only the direct payments required.

Based on computer models, it is estimated that WPPP will pay approximately $430 million (1983 dollars) in state and local taxes during the construction period and operation period. These taxes will be distributed throughout the State of Nevada. During the construction period, the County will receive most of the tax revenues from WPPP in order to assist in offsetting social impacts (i.e., all costs necessary to alleviate financial demands on County services due to WPPP). During operation, only 10 percent of the local sales tax revenues and assessed value will remain in the County.

Table 4-16 includes the estimates and distribution of WPPP tax revenues to the State of Nevada and its counties during the WPPP construction period and operation period. Table 4-17 includes the estimates and distribution of WPPP tax revenues to local government entities at the county level and lower during the WPPP construction period and operation period.

4.1.7.11 Quality of Life

During the WPPP construction period, the County may experience: 1) a short (one to two year) period of intense housing demand and some temporary shortages; 2) an influx of persons who are not integrated into the community; 3) a temporary increased demand for goods and services; and 4) a probable increase in unemployed transients, whose economic plight may strain local health and welfare services. These would be the most likely impacts on the quality of life in the County.

There will be about 4400 new residents at the peak of construction, not including an unknown number of transients. The County population will expand by over 50 percent of current levels. These in-migrants may not be fully incorporated into the local community setting. As newcomers, they may not be accustomed to the nuances of life in the County. Therefore, they are likely to be somewhat different from County residents. The in-migrants will include construction workers (and their families) who are accustomed to living in a place only two or three years, and who probably will not try to involve themselves in local community activities. On the other hand, supervisory personnel are likely to be well-educated, bring their families, and participate in the local community. These people have become adept at integrating themselves into a community.

A relatively large number of "strangers" coming into the community will affect the small town atmosphere which is important to many persons in the County. The dramatic increases in the incidences of impersonal contacts could result in unease and suspicion. Changes in the community which locals consider undesirable are likely to be blamed on the newcomers.

Any increase in crimes, such as theft, burglary, and assault and battery, will weaken the local perception that Ely is safe and secure. As a result, another characteristic of "small town atmosphere" may be affected.

The influx of newcomers unknown to local merchants is likely to result in many businesses experiencing more demand than can be handled, given preconstruction levels of business. As a consequence, personalized service may deteriorate. In addition, the likelihood of an increase in the cost of goods and services due to increased demand may impact existing residents who are on fixed income or who are underemployed and unemployed.

The dispersed recreation assets of the County, highly valued by local residents, could be impacted by newcomers. Poaching and illegal trespass of public and private lands may increase. Increased competition for fishing sites and hunting tags may also occur. In addition, undeveloped areas could experience increased usage.

Although the adverse effects discussed above are possible, they are not inevitable. Mitigative measures could prevent some of these effects. However, it is still likely that many people, particularly those who are not benefitting directly from WPPP, will perceive both Ely and the County as a less pleasant place to live during the construction period.

The adverse effects during the operation period will be of a much longer duration than those during construction period, but will involve fewer in-migrants, and, in general, will be less significant. In fact, the introduction of operation personnel more or less permanently into the community can be more positive than negative. For example, as the local business community adjusts to newcomer preferences, a wider variety of goods and services may be expected.

In the worst case, the stress and strife between newcomers and "oldtimers" could become so severe as to incapacitate local decision-making. Such a situation would be readily obvious and would result in loss of confidence by local residents that the community could solve its problems. As a consequence, satisfaction with life would decline even further.

Conversely, the construction and operation of WPPP could be seen by many as positive for the community and as one step toward stabilizing the County economy. Unless the economy is stabilized, the current satisfaction with life in the area will continue to deteriorate. Unfortunately, the construction and operation of WPPP alone may not reverse the declining economic trend. Unless there is other economic development, the dissatisfaction with the local economic situation probably will grow. In this sense, WPPP may not seriously affect the declining quality of life trend in the County. WPPP may even provide a needed boost in confidence as the community pursues additional avenues of economic development.

4.1.7.12 Mitigation

In order to assess the socioeconomic impact of WPPP and establish the necessary mitigation strategies to alleviate the adverse impacts, community planning studies were begun early in 1981. Because of the importance of the community and financial planning problems associated with

WPPP, socioeconomic considerations were included as a major consideration in the site selection studies.

After the selection of the three WPPP sites, the community planning studies focused on the community development program, which included the preparation of the Impact Alleviation Plan as required by the WPPP Development Work Agreement.

In order to identify the socioeconomic impacts on the communities, determine mitigation methods, and alleviate the social impacts of WPPP, a community impact alleviation planning process was developed. The community impact alleviation planning process consisted of: 1) collecting and analyzing data on baseline conditions; 2) forecasting employment, households, school enrollments, fiscal requirements, and population growth; 3) determining a housing strategy; 4) assessing socioeconomic impacts; 5) developing solutions or mitigation strategies necessary to alleviate any adverse impacts; and 6) preparing a plan to monitor any changes from projections.

The community impact alleviation planning process was intended to be a dynamic process within the impacted community. There are four basic steps in the process: 1) impact analysis; 2) impact assessment; 3) mitigation strategies; and 4) monitoring. The first three steps have been completed. The fourth step will allow future review of identified socioeconomic needs and mitigation strategies and updates, as necessary. The results of the community impact alleviation planning process and a discussion of the Impact Alleviation Plan are included in the following sections.

4.1.7.12.1 Socioeconomic Baseline

The first step of the community impact alleviation planning process was the collection of baseline data on social and economic systems in the County. The data were included in the White Pine County Socioeconomic Baseline 1982. This report contains information in the following areas:

- Demographic Characteristics
- Employment and Economic Base
- Income
- Housing
- Community Infrastructure
- Public Health and Safety
- Education
- Cultural and Recreation Facilities
- Land Use
- Government and Finance

The baseline was endorsed by the City of Ely, the County Board of School Trustees, and the County Regional Planning Commission in May 1982. In addition, the Board of County Commissioners endorsed the baseline in July 1982. (It should be noted that the baseline report has been updated as a part of the preparation of the EIS. Future updates will be made as necessary to incorporate any significant changes.)

The socioeconomic baseline represents a "snapshot" of the community at the time the data was gathered.

4.1.7.12.2 Labor Requirements

Data from the socioeconomic baseline were used in forecasting employment, households, school enrollment, fiscal requirements, and population growth. The construction and operation of WPPP will require the employment of a large number of workers new to the County. These people will most likely be located near their respective work area during the time they are associated with WPPP. This, in turn, will require that specific accommodations such as housing, schools, social services, water and sewage facilities, medical services, and law and fire protection be provided if they do not already exist. The estimated labor force requirements are discussed in Section 4.1.7.1.

4.1.7.12.3 Housing Strategy

A proposed housing strategy was developed using data from the socioeconomic baseline and work force profiles. The strategy has three primary objectives:

- Minimize the socioeconomic impact on the communities in and near the County.
- Attract and keep both construction workers and permanent operating personnel.
- Keep WPPP-related costs from becoming excessive.

As part of forecasting, an estimate of the number of housing units required to meet the needs of the direct construction and operation workers and their families, as well as the indirect workers and their families, was made. These estimates are discussed in Section 4.1.7.4.

Several aspects of personnel housing needs associated with the direct WPPP construction and operation workers, as well as the indirect population, were addressed in the preparation of the housing strategy. These included the availability, attractiveness, type, and affordability of the housing. The factors affecting the affordability of housing are:

- The level of family income
- The cost of housing
- The ability to finance or rent the housing unit

A major concern was that desirable housing could not be provided without some type of external adjustment to either the worker salary, the cost of the housing, or the cost of borrowing money. Without some adjustment or involvement by WPPP, the necessary housing to attract and maintain a stable work force would not exist until a significant improvement occurred in economic conditions. Therefore, in order to meet the anticipated housing demand and provide available, attractive, and affordable housing, it was proposed that WPPP would be responsible for financing and constructing all housing for the direct relocating construction work force above that provided by the private sector.

Meeting the demand for housing will be accomplished by: 1) accomodating up to 950 single-status workers at the WPPP site (700 in motel-style rooms and 250 in recreational vehicle spaces); 2) renting up to 400 existing vacancies in Ely; 3) constructing, or having constructed, up to 400 mobile home spaces; and 4) constructing, or having constructed, up to 400 recreational vehicle spaces. Where possible, temporary housing facilities for direct construction workers will be designed and constructed for conversion to permanent usage by both permanent WPPP employees and the general public. For the indirect construction work force relocating to Ely, WPPP will not be responsible for constructing, or providing incentives to construct, any housing.

In order to assure attractive, affordable, and quality housing for permanent employees during the operation period, WPPP will provide the assurance of affordable mortgage financing, transitional housing accommodations upon relocation, access to converted temporary work force housing, and possible guarantees to local developers to initiate construction. Other innovative incentives to assure affordable, attractive, and quality housing will also continue to be sought.

To the extent necessary to implement the housing strategy, land will be purchased within the City of Ely (or on adjacent land acceptable for annexation to Ely) to be used to meet the housing demands.

The anticipated distribution of the WPPP work force, based upon the housing strategy, is listed in Table 4-17. The distribution was based on a gravity model modified to allow for available services in each community.

4.1.7.12.4 Community Involvement Program

The second step in the community impact alleviation planning process, impact assessment, allowed the community to assess the potential impacts on public and private facilities and services, taking into account the current conditions and projected changes identified in the impact analysis. Based on this assessment, the most appropriate and adequate programs could be developed to minimize any negative impacts.

In order to meet the objectives of having public participation in the community impact alleviation planning process, the County, under its Power Plant Advisory Committee, established the following 13 subcommittees:

- Agriculture
- Business and Human Resources

- o Education
- o Fire Protection
- o Housing
- o Law Enforcement
- o Outdoor Sportsman
- o Public Health
- o Recreation
- o Social Services
- o Transportation
- o Utilities
- o Water, Sewer, Solid Waste, and Storm Drains

These subcommittees were active in the impact analysis process, as well as the impact assessment and development of mitigation strategies. As part of the process, each subcommittee also reviewed and approved the socioeconomic baseline, demographic projections, and the housing strategy. This information was used in the preparation of the impact on the community (the needs assessment) and mitigation alternatives.

Each subcommittee assessed the potential impacts on public and private facilities and services within its specific area of expertise. First, each subcommittee developed a list of issues and concerns. These issues and concerns were focused into specific community needs. Using appropriate guidelines, these needs were projected during the construction period, at the peak of construction, and during the first year of operation. These projections were compared with the existing condition or baseline and with the projected condition through 1990 without the WPPP in order to determine if a need existed. Needs were further identified as being WPPP-related or non-WPPP-related and temporary or permanent. The subcommittees then ranked the needs in order of importance.

As a result of their work, the subcommittees identified a total of 109 socioeconomic needs which were included in a draft report. Comments by the City of Ely, the County Board of School Trustees, the County Regional Planning Commission, and the County were incorporated and the final White Pine County Socioeconomic Needs Assessment in 1982 was presented to, and adopted by, the Power Plant Advisory Committee in October 1982. The Socioeconomic Needs Assessment was subsequently endorsed by the City of Ely and the Board of School Trustees.

The remaining work of the 13 subcommittees was to identify alternate plans related to the various needs identified in the Socioeconomic Needs Assessment. This process was initiated in October 1982. Each subcommittee was assigned the task of identifying: 1) the lead agency responsible for alleviating or providing for the need; 2) alternative methods of providing for the need; and 3) alternative financing methods.

For each need, it was determined whether or not the need was WPPP-related or whether the need was temporary (i.e., a need to be met only during the construction period) or permanent. This information, along with alternative mitigation measures and estimated costs, was compiled in the White Pine County Proposed Socioeconomic Mitigation Alternatives 1982 which was adopted by the Power Plant Advisory Committee in December 1982.

4.1.7.12.5 <u>Impact Alleviation Plan</u>

Work began on the development of the Impact Alleviation Plan in March 1982. This plan is defined in the WPPP Power Supply Development Agreement as the plan "for the alleviation of Social Impacts whereby (i) there shall be determined, or a means shall be established for determining, the Social Impacts and (ii) the County, from the proceeds of notes or Bonds (and only from such proceeds) shall provide timely financial or other assistance to alleviate such Social Impacts." Social Impacts are defined as the "financial demands that will be placed by the Project upon the population of, or services furnished by, the State of Nevada, the County, any other county, any city or town or any political subdivision, agency or district therof or created thereby."

Under the WPPP Power Supply Development Agreement and the Development Work Agreement, the County has the right to establish a Project Coordination Office to assist the County in carrying out its duties, responsibilities, and obligations. As part of Development Work, the Development Manager and the Project Coordination Office have the authority to separately hire, if necessary, an Impact Consultant to participate in preparing the plan. However, because of the successful implementation of the community impact alleviation planning process, this was not necessary and the same consultants assisted both the Development Manager and the Project Coordination Office in developing the Impact Alleviation Plan.

Two negotiating teams were established to prepare the Impact Alleviation Plan. One team represented the Development Manager and the WPPP participants. The other team, which consisted of persons from the Project Coordination Office, the County (and its Special Legal Counsel), the City of Ely, and WPCSD represented affected parties in White Pine County.

The Impact Alleviation Plan is in the form of an agreement between WPPP and the County, the City of Ely, and WPCSD. The agreement establishes a detailed process which the two negotiating teams have used to agree on social impacts and will continue to use to negotiate and resolve the issues relating to the existence of socioeconomic needs that result in social impacts in the future. As approporiate, the agreement identifies specific needs for which a social impact has been identified. In addition, the agreement identifies: 1) socioeconomic needs for which it is known a social impact will exist but for which mitigation methods and resulting social impacts have not yet been determined; 2) socioeconomic needs for which WPPP is solely responsible; and 3) socioeconomic needs for which WPPP has no responsibility for providing any financial assistance. The agreement provides a mechanism for funding and financing of these social impacts identified to date or in the future.

The agreement identifies the percent of each socioeconomic need that is the responsibility of WPPP and the preferred mitigation alternative for alleviating each need. Much of the mitigation is based on a revenue expenditure model that has been developed by the Development Manager for the affected parties.

The total tax revenues and social impacts during the construction period to the County, the City of Ely, and WPCSD are shown on Figure 4-24, Figure 4-25, and Figure 4-26, respectively. (It should be noted that these projections are based on present demographic projections as well as the Nevada tax laws as they existed in June 1984.) Based on current projections of revenues and expenditures, there will be sufficient revenues to offset costs associated with the Impact Alleviation Plan. However, because of the lag time in generating the revenues, WPPP may have to advance some monies. The only potential liability to WPPP would be the commitment to guarantee certain school expenditures should WPPP construction be initiated but terminated before completion. In order to maintain flexibility, the Impact Alleviation Plan includes provisions to monitor the effectiveness of the mitigative measures and to detect any unexpected community impacts.

After the Development Manager and the Project Coordination Office agreed to the Impact Alleviation Plan, it was submitted to the County, the City of Ely, the School District, and to the Management Committee for their respective approvals. These approvals occurred during August 1983. In November 1983, the Impact Alleviation Plan was approved by the WPPP Management Committee.

In general, impacts to agricultural producers would be on an individual basis and the application of mitigation would be dependent on the location and severity of the impact. Because of this, work is ongoing with members of the Agriculture Subcommittee to prepare the agricultural industry part of the Impact Alleviation Plan. To assist in this work, a Memorandum of Understanding (MOU) between White Pine County and the Development Manager was signed in December 1983. The MOU includes the contents of the plan and the procedure for implementing the plan. The final plan will be a framework within which impacts on individual agricultural producers will be determined and agreements for mitigation of these impacts will be developed and implemented.

4.1.8 Electrical Effects

With alternating-current transmission lines, the voltage on the conductor and the current flowing in the conductor are continually varying in magnitude and direction. In the United States, this oscillation occurs at a frequency of 60 cycles per second or 60 hertz (Hz).

The voltage on the conductor produces an electric field and the current produces a magnetic field. These fields, which also oscillate at a frequency of 60 Hz, can induce voltages and currents in objects and persons in the vicinity of the transmission line. In addition, the high electric field at the surface of the conductor may lead to corona generation. Corona may result in audible noise and radio and television interference.

The wavelength (physical length of one complete cycle) of an electric or magnetic field can be determined by dividing the velocity of light by the frequency of the field. Wavelength varies inversely with frequency. In comparison with the electric power transmission line frequency of 60 Hz and corresponding wavelength of 3100 miles, television transmitters operate in the megahertz (MHz) range, approximately 55 MHz to 890 MHz with wavelengths of 13 inches to 18 feet. Microwaves operate at 1000 MHz and above with wavelengths of 1 foot and less.

This relationship is fundamental to an understanding of why high-frequency radio and television signals are transmitted through the air and 60 Hz electric power is transmitted through metallic conductors. The length of antenna necessary to effectively radiate or receive electrical energy is directly proportional to the wavelength of the fields. Transmission lines are poor 60 Hz transmitting antennas. The low frequency power is not radiated away as with high frequency television and radio transmitters. The electric and magnetic fields remain within the vicinity of the transmission line and their strength decreases rapidly away from the line. It should be noted that humans are poor receptors of 60 Hz energy because of this relationship between antenna size and wavelength.

Ionizing radiation consists of very high frequency energy with sufficient intensity to strip electrons from matter. Examples include Xrays and nuclear radiation. Lower frequency energy which does not have this ability, such as microwaves and radio and television signals, is termed "non-ionizing" radiation. Although 60 Hz fields are frequently included in discussions of non-ionizing radiation, there is effectively no radiation at 60 Hz from power transmission lines, and a discussion of 60 Hz phenomena is more accurately termed "field effects."

4.1.8.1 Electric Fields

Voltage on any wire produces an electric field in the area surrounding the wire. An electric field consists of invisible lines of force that repel or attract electrical charges. The strength of an electric field is described in terms of voltage per unit distance at a specified location.

Electric fields near alternating current transmission lines are easily measured with hand-held meters and are usually measured in units of kilovolts per meter (kv/m) where 1 kv/m means that between two points in air 1 meter apart, there is a voltage difference of 1 kv (1000 volts).

The maximum calculated electric fields at a standard reference height of 1 meter above ground for typical 230 kv ac and 500 kv ac transmission lines are shown on Figure 4-27. These values occur where the conductors are nearest the ground and when the line current and air temperature reach maximum conditions. These maximum conditions seldom occur and field measurements near operating lines are generally less than the calculated maximum design levels.

Electric fields are perturbed (or distorted) by objects placed within the field. Grounded objects such as fences, trees, and buildings will cause the field to be reduced in the vicinity of these objects. In addition, metallic vehicles and structures will shield occupants from external electric fields. Measurements in and around houses near 500 kv ac transmission lines have shown that the electric field inside a house is dominated by sources within the home.

4.1.8.2 Magnetic Fields

Magnetic fields are produced by current in a conductor. The strength of a magnetic field is measured in terms of lines of force per unit area. Measurements are given in gauss (G).

The maximum calculated magnetic fields at a standard reference height of one meter (3.3 feet) above ground for typical 230 kv ac and 500 kv ac transmission lines are shown on Figure 4-28. These values occur where the conductors are nearest the ground and when the line current and air temperature reach maximum conditions. These maximum conditions seldom occur and field measurements near operating lines are generally less than the calculated maximum design levels.

The magnetic field beneath a transmission line is weak compared with fields near common household appliances. Sixty Hz magnetic fields of 1 G to 5 G may exist near appliances such as food mixers and electric drills. Unlike electric fields, 60 Hz magnetic fields easily pass through most objects, including buildings and people, and are not perturbed by the presence of most objects.

Alternating magnetic fields induce electric fields and currents in living organisms. From a transmission line, however, these fields and currents are even weaker than the internal fields produced by the electric field. Most interest in transmission line fields, therefore, has been concerned with the electric rather than the magnetic component.

4.1.8.3 Induced Currents and Voltages

When a conducting object, such as a vehicle or person, is in an alternating current electric or magnetic field, currents and voltages are induced in the object. The induced current varies with the field strength, the frequency of the field, the size and shape of the object, and the electrical resistance between the object and ground. Induced current effects may be classified as: 1) perceptible short-term effects; and 2) effects due to long-term exposure to electric fields.

4.1.8.3.1 Short-Term Biological Effects

A person standing beneath a 230 kv ac or 500 kv ac transmission line will receive an induced current which is below the level of perception. Similar subperception body currents are encountered when sleeping beneath an electric blanket and upon contact with common household appliances.

A person may, however, directly perceive an electric field. Although most people would not detect even the maximum electric field under a 500 kv ac transmission line, some people may sense a gentle movement of hair on the head or upraised arm. This hair vibration is caused by alternating charges induced by the electric field on the body surface.

When a conducting object is isolated from ground, such as a vehicle, and a person contacts the object within an electric field, a perceptible current or shock may occur. A similar event occurs when the person is isolated and the object is grounded. The amount of current is dependent on the strength of the electric field, the size of the object, and how well the person and the object are isolated from ground. In addition, magnetic fields can induce voltages at the ends of long, partially-grounded conducting loops such as fences and irrigation pipes.

Although shock levels are difficult to define precisely, the following general classifications of shocks can be made:

- Below perception.

- Above perception. Perception levels are approximately 1.0 milliamp (ma) for an average man and 0.6 ma for an average woman.

- Secondary. No direct physiological harm but may be annoying or cause involuntary muscle reaction. (The lower average secondary shock level for an average size man is approximately 2.0 ma.)

- Primary. May be harmful. Above the level at which 99.5 percent of subjects can involuntarily "let go" of the shocking electrode. (Approximately 9 ma for an average man, 6 ma for an average woman, and an estimated 5 ma for children.)

The National Electric Safety Code specifies 5 ma as the maximum allowable short circuit current to vehicles and equipment near transmission lines. For the WPPP power transmission system, even under worst case conditions, shock current to persons contacting vehicles near the 230 kv ac and 500 kv ac transmission lines will be below 5 ma.

In addition to the steady state current that flows when a person contacts an object within an electric field, the person may receive a spark discharge just prior to contact. This affect is similar to that experienced after walking across a carpet and then touching a door knob. The magnitude of spark discharges near a transmission line is dependent on the size of the object which is discharged, voltage on the object, and ground conditions. Spark discharges from large vehicles on a right-of-way may be perceptible or even annoying but will not be harmful. Grounding of objects will prevent the build-up of electrical charge and eliminate spark discharges.

4.1.8.3.2 Long-Term Biological Effects

Worldwide experience with transmission lines operating at voltages up to 765 kv ac and the overall results of numerous studies provide no conclusive evidence that these lines pose a long-term biological hazard. The issue of possible long-term biological effects from transmission lines is controversial and occasional non-scientific articles continue to evoke public concern. The controversy concerns not only whether effects exist but whether an effect can be considered hazardous.

The electric field health effects literature is extensive, and some researchers have reported finding effects attributable to electric field exposure. In general, however, attempts to replicate these studies under closely controlled conditions are either unsuccessful or find that the reported effect was caused by a factor unrelated to the electric field.

Several literature reviews are listed in the bibliography in Chapter 7. Dr. Morton W. Miller of the University of Rochester, in the Victorville-Rinaldi Final Environmental

Impact Report, supports the conclusion drawn from the bulk of the available scientific evidence which indicates that transmission line electric fields are not a health hazard.

It should be noted that some studies have confirmed that transmission line electric fields can affect honeybees and that some trees growing beneath the lines suffer leaf tip damage due to corona. The effects on honeybees can be mitigated by shielding the hives from the electric field. Damage to trees is very limited and does not affect overall tree growth. Neither of these effects is considered to be of adverse biological consequence.

4.1.8.3.3 Special Cases

Special cases related to induced currents and voltages include cardiac pacemakers, flammable materials, fences, and metal structures. These are discussed below.

Cardiac pacemakers are electronic devices. As such, pacemakers are potentially susceptible to interference when exposed to electric or magnetic fields. Radio transmitters, automobile ignition systems, electric shavers, fluorescent lamps, microwave ovens, hair dryers, and overhead high-voltage transmission lines are some of the possible field sources. Normal leakage current from portable appliances found in the home can also affect pacemakers.

Only a small percentage of cardiac pacemaker implants are considered susceptible to interference by electric or magnetic fields. Modern pacemakers are well protected from these fields. They can also sense interference and are designed to shift to a fail-safe mode of operation. However, patients who are often near overhead transmission lines may wish to consult with their physician to determine if their type of pacemaker could be affected and if brief interference could be a problem. Any pacemaker wearer who experiences discomfort or an abnormal pulsing rate should leave the transmission line environment and consult a physician.

Another concern involves ignition of flammable materials, such as fuel vapor. Experiments which simulated refueling of vehicles under a transmission line under closely controlled conditions indicated that it is possible to ignite fuel vapor by spark discharge. However, the simultaneous occurrence of circumstances for which a spark discharge at a fuel spout could ignite gasoline vapor is an extremely remote possibility. As a conservative precaution, utilities discourage or prohibit the refueling of vehicles beneath transmission lines.

The heat, gas, and smoke of a large fire on a transmission line right-of-way can cause a hazardous electrical breakdown of the air between the conductors of a transmission line and ground. As a preventive measure, flammable material should not be stored on transmission line rights-of-way.

Wire fences which parallel high-voltage transmission lines may need to be electrically grounded at one or more locations to eliminate the possibility of annoying shocks. The severity of the shock depends on the fence length, its distance from the lines, and the magnitude of electric and magnetic fields at the fence. Wire fences supported entirely on metal fence posts are practically grounded already through the metal posts. For wire fences supported on wood or other semi-insulating posts, grounding can be practically achieved with metal fence posts or with ground rods.

Grounding at a single location to mitigate effects of electric fields on nearby fences is sometimes sufficient to prevent all shocks. However, there may be circumstances under which a considerably long parallel wire fence or metal pipe may be influenced more by the magnetic field than by the electric field. For these cases, the electrical grounding necessary to mitigate effects is installed at more than one location, and electrical breaks in a fence are sometimes required.

Electric fences cannot be directly grounded, but there are special filters designed to drain the charge induced by overhead transmission line fields to ground while allowing the electric fence to perform its intended function.

Large metal buildings immediately adjacent to overhead high-voltage transmission lines, if not already grounded by direct connection to earth, may need to be electrically grounded to eliminate the possibility of annoying shocks. Large metal roofs on other types of buildings may also require grounding for this purpose. Other metallic objects, such as gutters and down spouts attached to buildings, can sometimes be long enough or close enough to an overhead transmission line so that grounding to avoid possibly annoying shock effects becomes desirable.

4.1.8.4 Corona

Corona occurs when the electric field near the surface of conductors, insulators, and hardware is of sufficient magnitude to cause ionization (partial breakdown) of the air surrounding these components. The electric field is intensified at sharp irregularities and, consequently, nicks, scrapes, and insects on the surface of conductors and hardware become corona sources. During foul weather, water drops form on the conductors increasing corona activity. Although it is not practical to design a transmission line that will be entirely free of corona during foul weather, it is possible to keep the generation of corona and its effects within limits acceptable to the public.

Corona effects include audible noise, radio, and television interference, and ozone. These are discussed in the following sections.

4.1.8.4.1 Audible Noise

Overhead high-voltage transmission lines sometimes emit low-level humming, buzzing, and crackling sounds. This noise is most common for lines operating at voltages above 230 kv ac. In wet weather, the noise may reach more noticeable levels. Outdoors, background noises (such as the sound of rainfall) partially mask high-voltage transmission line noise. Indoors, line noise is significantly reduced by its passage through exterior walls.

Noise levels from transmission lines beyond the transmission line right-of-way will be within guidelines established by the EPA.

4.1.8.4.2 Radio and Television Interference

In general, overhead high-voltage transmission lines do not intefere with normal television or radio reception off the utility right-of-way. However, interference attributable to high-voltage lines is possible with a location close to the right-of-way, weak broadcast signals, an abnormal line condition, or poor receiving equipment. Utility experience has been that such conditions are few and generally correctable. While transmission lines are not often found to be the cause of interference, electric utilities are prepared to investigate and resolve complaints.

4.1.8.4.3 Ozone

Ozone is a naturally occurring form of oxygen gas in the atmosphere. Prolonged exposures to high concentrations of ozone are recognized as potentially harmful to humans, animals, and plants.

Some high-voltage transmission lines can generate trace amounts of ozone, primarily in foul weather. The amounts, if any, do not accumulate under any weather conditions and are insignificant compared to background levels.

4.1.8.5 Mitigation

During construction, large metal objects and structures will be grounded to eliminate potential shock hazards. For long, parallel metal objects such as fences, it may be necessary to break the electrical continuity.

Corona effects will be minimized by use of large conductors and efforts to protect the conductor from nicks and scrapes during stringing.

If it is determined that operation of the transmission line impairs radio or television reception, steps will be taken to correct the problem. Corrective action may include measures to eliminate an isolated source of interference (such as faulty insulators or hardware) or improvements to the receiving equipment.

4.2 UNAVOIDABLE EFFECTS

This section addresses the unavoidable effects which will remain after mitigative measures are implemented. Only those resources with unavoidable effects are discussed.

Soil compaction during construction and modification of existing drainages could increase the potential for erosion on the site or along the corridors.

There will be a temporary deterioration of ambient air quality during construction even if dust control measures are implemented. Power plant emissions will be within federal and state standards.

Construction of WPPP facilities will remove soil and vegetation from the site and corridors, thereby reducing wildlife and livetock forage and habitat. Weedy species could invade disturbed areas.

Groundwater withdrawal and human encroachment could result in impacts to nearby springs and ponds, some of which are inhabited by sensitive aquatic species. Groundwater withdrawal could reduce soil moisture in wetland areas (specifically in productive saline meadows) thereby causing a successional change to less productive vegetation.

Even after a detailed archaeological field survey is conducted prior to construction, inadvertent damage to undiscovered sites could still occur.

The introduction of the WPPP Generating Station and lineal facilities will affect the scenic values of the natural landscape by creating a visual intrusion.

The County will experience a 46 percent increase in population during peak construction. The additional population could impact local services not covered by the Impact Alleviation Plan. Increased human activity could impact recreational areas. Impacts on the agricultural community will result from the removal of grazing land.

WPPP may unavoidably and adversely impact the perceived quality of life of some of the residents of the County, especially during the construction period. This will be due to the influx of people, many of whom possess values, customs, and personal economic situations different from certain segments of the local population.

Although stricter enforcement may mitigate some of the anticipated increases in poaching and in trespass uses of private or public land, full mitigation is not possible, and instances of these activities will be unavoidable.

4.3 SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

This section compares the lasting short-term uses associated with construction and operation of WPPP to the long-term productivity beyond the 6-year construction period and the 36-year operation period.

The unavoidable effects after mitigation associated with short-term uses are described in Section 4.2. Irreversible environmental changes, primarily the commitment of existing resources, are described in Section 4.4. The latter represent impacts that will extend beyond the life of the project. In addition, up to 25,000 afy of water appropriated to WPPP would be unavailable for other uses during the life of the project.

In exchange for short-term uses, electrical energy will be available to consumers in Nevada and California. Generation of electricity from coal will help conserve other fossil fuels. In addition to energy, employment and economic benefits will accrue to the County during the construction period and the operation period. There will also be economic benefits to entities in the State of Nevada.

4.4 IRREVERSIBLE ENVIRONMENTAL CHANGES

This section discusses changes that will remain after the WPPP operation period. These changes are primarily due to commitment of existing resources.

Approximately 140 million tons of coal will be consumed over the life of the project. Water evaporated as a part of WPPP Generating Station cooling and not returned to the Steptoe Valley hydrologic basin could also be considered as consumed. Approximately 500 acres of land will be required for the long-term disposal of flyash, scrubber reactions products, bottom ash, and other waste products.

Existing soil integrity at the location of the WPPP facilities will be destroyed during construction ultimately resulting in irretrievable soil losses. In addition, it will take time for soil composition, including horizon characteristics, to return to their original state after WPPP facilities are removed.

Existing vegetation will be removed at the location of the WPPP facilities during the initial stages of construction. Complete restoration of the floral and structural composition of the plant community is not expected. Therefore, the loss of existing vegetation diversity will be irretrievable. In addition, it will take time to reestablish the orginal ecosystem after groundwater withdrawals stop.

Other irreversible changes could result from the visual impact of construction scars or any facilities that are not removed at the end of the operation period. Increased population due to WPPP and increased access to remote areas could impact future use of recreational resources. There could be inadvertent destruction of cultural resources during construction.

5.0 CONSULTATION, COORDINATION, AND COMMENTS

This chapter includes information on state, federal, and local government agencies and private interest groups who were consulted during the preparation of the Draft EIS. Responses were solicited from special interest groups regarding particular environmental issues addressed in the Draft EIS. Communication regarding issues of concern varied from written comments to formal meetings and consultation. In addition, the WPPP Development Manager conducted numerous public meetings to keep the County informed of WPPP progress. As a highly visible project, WPPP also received extensive coverage by media throughout the State of Nevada.

In addition, this chapter includes comments that were received during the Draft EIS review period. Responses to both written comments and comments received at public hearings are provided.

5.1 SCOPING PROCESS

The BLM issued a Notice of Intent to prepare the EIS in the February 4, 1982 issue of the Federal Register (47 FR 5360). Formal briefings for federal and state agencies were conducted on March 2, 1982 in Reno and Carson City, Nevada. The following evening, a public scoping meeting was held in Ely, Nevada. Twelve persons presented public comments which were based primarily on socioeconomic impacts. In addition, written comments were received during the 45-day scoping period. These comments were from three federal agencies (EPA Region IX, ICC, and the National Park Service), seven Nevada agencies (Department of Wildlife, Department of Transportation, Office of Community Services, Division of Mineral Resources, Division of Forestry, Division of Historic Preservation and Archaeology, and Division of State Parks), and three others (Ruth Town Council, Sierra Club - Toiyabe

Chapter, and the White Pine MX Human Services Planning Team). Comments received as a part of the scoping process were incorporated into the Draft EIS.

In addition to information received during the scoping process, the following agencies and groups provided information, data, consultation, and comments during preparation of the Draft EIS:

- Environmental Protection Agency (Region IX) - Dames & Moore and LADWP worked closely with EPA to develop a strategy for addressing the potential air quality impacts in the Draft EIS. Strategies included implementation of computer modeling techniques to predict air emissions from WPPP.

- State of Nevada, Division of Environmental Protection - DEP was an integral member of the team developing strategies to offset air emissions impacts from WPPP.

- Interstate Commerce Commission (ICC) - Meetings were held with representatives of ICC to address issues related to coal transportation by rail.

- U.S. Fish and Wildlife Service - A Biological Assessment, as required by Threatened and Endangered Species Act regulations, was prepared in consultation with USFWS to address potential impacts to federally listed threatened and endangered species and candidate species. As a result of the consultation, USFWS provided a list of species for inclusion in the Draft EIS.

- Soil Conservation Service - In response to the need for third order soil maps of Spring Valley, SCS agreed to map the Spring Valley Site as part of its regular mapping program. SCS also provided data on ecological sites for the ecological resources and socioeconomic impact analyses.

- Nevada Employment Security Department - ESD provided labor force and employment data and projections for use in the socioeconomic impact analyses.

- Nevada Planning Coordinator's Office - PCO provided population growth projections for White Pine County for use in the socioeconomic impact analysis.

- As part of the Native American consultation process, written comments were solicited from the following groups:

  Ely Colony Council
  Western Shoshone Sacred Lands Association
  Inter-Tribal Council of Nevada
  Duckwater Shoshone Tribe of the Duckwater Reservation
  Confederated Tribes of the Goshute Reservation
  Wells Indian Colony
  Moapa Band of Paiute Indians
  Odgers Ranch, South Fork Reservation

5.2 REVIEW PROCESS

The Draft EIS was made available to the Environmental Protection Agency and the public on October 20, 1983. A notice of availability was published in the Federal Register on October 26, 1983 (48 FR 49556). Approximately 400 copies of the Draft EIS were distributed for review and comment. The following is a partial list of entities, organizations, agencies, companies, and individuals that received the Draft EIS:

FEDERAL AGENCIES

U.S. Fish and Wildlife Service
U.S. Forest Service
National Park Service

U.S. Weather Service
Federal Aviation Administration
Soil Conservation Service
U.S. Environmental Protection Agency
U.S. Department of Energy
U.S. Bureau of Land Management Nevada District Offices and Salt Lake City, Richfield, and Cedar City, Utah District Offices
U.S. Bureau of Mines
Bureau of Indian Affairs
U.S. Geological Survey
Rural Electrification Administration
Interstate Commerce Commission
U.S. Bureau of Reclamation
Nellis Air Force Base

STATE AGENCIES AND ENTITIES

Nevada State Clearinghouse
Nevada Department of Wildlife
Nevada Division of State Parks
Nevada Department of Conservation and Natural Resources
Nevada Division of Community Services
Nevada Department of Transportation
Nevada Division of State Lands
Nevada State Water Engineer
County Extension Agents, Clark, Elko, Nye, White Pine, and Lincoln counties

LOCAL AGENCIES/OFFICIALS

Boards of County Commissioners - White Pine, Elko, Nye, Eureka, Lincoln, and Clark counties
Planning Commissions - White Pine and Lincoln counties
Central Nevada Development Authority
Superintendent, White Pine County Schools
President, White Pine County School Board
Mayor, City of Ely
Chairpersons - Preston/Lund, McGill, and Ruth Town Councils
City Manager, City of Henderson

LIBRARIES

White Pine County Library
Washoe County Library
Lincoln County Library
Elko County Library
Clark County Library
Eureka County Library

Nye County Library
University of Nevada libraries, Reno and Las Vegas
Nevada State Library
Henderson City Library

STATE/FEDERAL OFFICIALS

U.S. Senator Paul Laxalt
U.S. Senator Chic Hecht
Congressman Harry Reid
Congresswoman Barbara Vucanovich
Governor Richard Bryan
State Senator Richard Blakemore
State Assemblyman Virgil Getto

ADVISORY GROUPS

Bureau of Land Management - Ely District Grazing Advisory Board
Bureau of Land Management - Ely District Advisory Council
Lincoln County CRMP
White Pine Power Project Advisory Committee and Subcommittee Chairpersons

INDIAN TRIBES

Confederated Tribes of the Goshute Reservation
Duckwater Tribe
South Fork Reservation, Odgers Ranch
Ely Colony Council
Moapa Band of Paiute Indians

OTHER GROUPS, FIRMS, AND INDIVIDUALS

Amselco Minerals
Boundy and Foreman, Inc.
Kennecott Corporation
Mt. Wheeler Power Company
White Pine Chamber of Commerce
Wild Horse Organized Assistance
Resource Concepts, Inc.
The Wilderness Society
International Society for the Protection of Wild Horses and Burros
Nevada Cattleman's Association
Nevada Mining Association
Nevada Woolgrowers Association
Sierra Club
Wildlife Management Institute

NEWS MEDIA

Lincoln County Record
Ely Daily Times
KELY Radio
Wells Progress
Elko Daily Free Press
Elko Independent

In addition to the above, the Draft EIS (or a summary) was sent to other organizations, firms, and individuals (including grazing licensees).

The review period for the Draft EIS ended on January 3, 1984. Five public hearings were held on the Draft EIS. The testimony transcripts from the public hearings and comments received in letters during the public review period identified parts of the Draft EIS that needed correction, clarification, or expansion. The Final EIS includes responses to all relevant comments. Where necessary, sections of the Draft EIS were revised to reflect comments or to provide updated information that became available after the release of the Draft EIS. It should be noted that comments that were not in the form of a question, or that reflected support or opposition, do not have written responses. However these comments will also be considered in any decision on WPPP.

5.3 PUBLIC HEARINGS

The BLM conducted five formal public hearings on the Draft EIS during the public hearing period. All hearings were recorded by a court recorder. The full hearing transcripts are available for review at the BLM Nevada State Office in Reno, Nevada, and in BLM district offices in Ely, Elko, and Las Vegas.

5.3.1 Ely, Nevada

A public hearing on the Draft EIS was held in Ely, Nevada on November 14, 1983 from 7:07 p.m. to 7:48 p.m. The hearing panel included John Matthiessen, BLM Hearing Officer, and Ronald P. Merlo, WPPP Environmental Engineer. The following are the individuals who presented testimony, a summary of their comments, and responses (where appropriate):

- Brent Eldridge, Chairman of the Board of County Commissioners for White Pine County, spoke in support of WPPP.

- Barlow White, Mayor of the City of Ely, spoke in support of WPPP.

- Lyle Taylor, President of the Chamber of Commerce of White Pine County, spoke in support of WPPP.

- Mike Baughman, Project Manager for Resource Concepts, Inc., presented comments on behalf of the Agricultural Subcommittee of White Pine County. A copy of the comments and the responses are included in Section 5.4.1.

- Clara Fondi spoke for Art Olson, Chairman of the White Pine County Power Plant Advisory Committee, in support of WPPP.

- Phil Carter, President of the White Pine County Board of School Trustees, spoke in support of WPPP.

- Richard Foreman, representing the White Pine County Industrial Park Review Board, spoke in support of WPPP.

- Bill Wilson, geologist, had the following comments related to the mining industry:

Comment E-1: "We are not so sure that were a mine to open in Steptoe Valley . . . if we would be able to permit through the state to get enough water to run these operations and so forth."

Response: In order for a new mine requiring groundwater to locate in Steptoe Valley, the mine would have to receive a water permit from the State Engineer. The permitting process would be similar to the process required of WPPP. It should be noted that, even with the 25,000 acre-feet per year permitted to WPPP, over half of the groundwater in Steptoe Valley is unappropriated. In addition, because Steptoe Valley is a designated hydrographic basin, the industrial use of water in a mining operation could have preferential treatment in any water filings.

Comment E-2: "We want to know if a new mining property will have to go out and purchase air . . . are we going to have enough air to start up a new mine and supposedly a smelter?"

Response: In order for a new mine and smelting operation to locate in Steptoe Valley, an applicable state and/or federal air permit would be required. The permitting process would be similar to the process required of WPPP. It should be noted that the issuance of an air permit to WPPP would not preclude the siting of any other industrial facility in Steptoe Valley.

Comment E-3: "And can we build power lines to our properties . . . because of the competition with the power project and mining and cattle industry over all the same parcels of land . . . ."

Response: The construction of power lines for other industrial operations would be dependent on the type of facility, location of the lines, and appropriate regulatory process.

Comment E-4: "Is the power project itself going to create competition and higher prices and competitively more materials and higher prices for the same goods and services?"

Response: A temporary increased demand for goods and services is recognized in Section 4.1.7.11 which includes impacts to the quality of life. Increased demand could create higher prices.

5.3.2 Elko, Nevada

A public hearing on the Draft EIS was held in Elko, Nevada on November 15, 1983, from 7:10 p.m. to 7:13 p.m. The hearing panel included John Matthiessen, BLM Hearing Officer, and Ronald P. Merlo, WPPP Environmental Engineer. Harry Wolfley, resident of Elko, spoke in support of WPPP.

5.3.3 Las Vegas, Nevada

A public hearing on the Draft EIS was held in Las Vegas, Nevada, on November 17, 1983, from 7:08 p.m. to 8:03 p.m. The hearing panel included John Matthiessen, BLM Hearing Officer, Donna McClay, Dames & Moore Project Manager, and Ronald P. Merlo, WPPP Environmental Engineer. The following are the individuals who presented testimony, a summary of their comments, and responses (where appropriate):

- Robert Anselmo, City Manager of the City of Henderson, had comments related to the WPPP power transmission system.

Comment LV-1: "First of all, the City of Henderson does not believe that . . . in fact an established corridor has been resolved . . . . There are rights-of-way that have been granted but there has not been an established utility corridor as of this date to the best of our knowledge."

Response: It is recognized that there is no established utility corridor. Additional information on this issue is included in Section 5.4.4 in response to Comment L1-6.

- Melvin Bagley, resident of the City of Henderson, spoke in opposition to the WPPP power transmission system.

- John Foley, Las Vegas attorney representing the City of Henderson and others, had comments related to the WPPP power transmission system.

Comment LV-2: "But I can't understand that you are going to go from the plant to Eureka. Why don't you go from Eureka to California? I haven't seen any suggestion that this is even considered."

Response: Preliminary studies for the WPPP power transmission system, including a scheme westerly to California, are discussed in Section 2.2.3.1. The section has been revised in the Final EIS to provide additional information on transmission system alternatives.

Comment LV-3: "There is no benefit to Henderson."

Response: Benefits to the City of Henderson include the availability of power for future load growth because of the participation of Nevada Power Company in WPPP and the availability of additional tax revenues due to construction and operation of WPPP in

Nevada. Additional information on economic benefits to the City of Henderson is included in Section 4.1.7.10 which has been added to the Final EIS.

Comment LV-4: ". . . we feel very strongly about this in that we cannot understand L.A. Power, how they say in good faith that they were only going to have one line through Henderson when they had this White Pine Power Project going since 1978."

Response: The City of Henderson was informed of the total number of transmission lines through the city as early as October 1978. Additional information is included in Section 5.3.5 in response to Comment H-3 and in Section 5.4.4 in response to Comment L2-8.

- Elizabeth Foley, Las Vegas attorney representing the City of Henderson and others, had comments related to the WPPP power transmission system.

Comment LV-5: ". . . in White Pine EIS an alternative is briefly mentioned at page 248 [sic] and that alternative says in one sentence that a third scheme of the power transmission lines would include a transmission line westerly to California and then southerly to the Los Angeles area -- assumingly [sic], avoiding the Henderson area. . . . There is no way to see where this possible alternative route might be. . . . I feel that this alternative needs to be explored further."

Response: Section 2.2.3 has been revised in the Final EIS to provide additional information on preliminary transmission studies, including alternative systems.

Comment LV-6: "None of the maps in the White Pine EIS are scaled so that Henderson is really -- is really depicted in such a manner that anyone can see exactly what impact these lines are going to have."

Response: Figure 5-1 has been added to the Final EIS to show the two-mile-wide study corridor in relation to the boundaries of the City of Henderson.

- Richard Heckendorf, Director of Planning for the City of Henderson, had comments related to the WPPP power transmission system.

Comment LV-7: "In all of your maps the City of Henderson is totally ignored . . . there is no map to show the boundaries of the City of Henderson."

Response: Figures that show impacts due to the WPPP power transmission system (Figure 4-4, Figure 4-9, Figure 4-10, and Figure 4-20) are drawn on detailed base maps that include the City of Henderson. In addition, the oversized White Pine Power Project Study Area figure shows the boundaries of the City of Henderson in relation to the WPPP power transmission system. Figure 5-1 has been added to the Final EIS to show the two-mile-wide study corridor in greater detail.

Comment LV-8: ". . . the premise of these transmission lines is based on the fact that the IPP statements [sic] say that the transmission corridor is previously evaluated. . . . That is not true. It is not complete yet. It is not out of litigation."

Response: Information on litigation associated with IPP is included in Section 5.4.4 in response to Comment L2-1.

Comment LV-9: "You go to the McCulloch [sic] Switching Station and it does not say how you get back to the Las Vegas Valley."

Response: Information on the distribution of power to southern Nevada participants is included in Section 5.4.4 in response to Comment L2-3.

Comment LV-10: "You state that the Harry Allen Generating Station will do rethinking to the distribution of your power. That is postponed to 1990. But you don't say a whole lot more from that point on. You think you have to be serious about how you do that -- if the Harry Allen Plant is not on line."

Response: WPPP is not dependent on the construction and operation of the Harry Allen Generating Station.

- Richard O'Bringer, resident of the City of Henderson, spoke in opposition to the WPPP power transmission system. He emphasized the visual impacts of transmission lines in the Henderson area.

- Francisco Gonzalez, resident of the City of Henderson, had comments on the WPPP power transmission system.

Comment LV-11: "One thing you forgot to mention, human beings and what it does to human beings. First of all, that should be at the top of the list, what damage it does to people."

Response: Information on the electrical effects of power transmission lines is included in Section 4.1.8 which has been added to the Final EIS.

- Robert Branch, general partner of Yellow Rose Limited, had comments on the WPPP power transmission system.

Comment LV-12: "The proposed line wipes out about roughly ten miles of prime foothills in Henderson. . . . That is the prime residential view land for Henderson to grow toward and the projective [sic] growth in Henderson is substantially over the next ten years. . . . there has been practically no consideration given to the area of Henderson . . ."

Response: Information on impacts to the City of Henderson is included in Section 5.4.4 in response to Comment L1-1. Information on the City of Henderson land use plan is included in Section 5.4.4 in response to Comment L2-5.

A two-mile-wide study corridor was selected to allow flexibility in locating the transmission lines. This flexibility includes avoiding, where possible, developable lands and avoiding Bighorn sheep and their habitat in the adjacent River Mountains. Because the transmission lines will be near the toe of the slope of the River Mountains, the visual impact would be minimized.

- Robert Hall, resident of the City of Henderson, had comments related to the WPPP power transmission system.

Comment LV-13: ". . . I haven't heard anything about electric smog or that consideration. . . To bring all these lines, these several lines through Henderson of course would bring a very serious health hazard onto [sic] the City of Henderson and I think that this is one thing that has not been taken into consideration."

Response: Information on the electrical effects of power transmission lines is included in Section 4.1.8 which has been added to the Final EIS.

Mr. Hall also referenced an article entitled "The Menace of Electric Smog" by Lowell Ponte printed in the January 1980 issue of Reader's Digest. This article discusses the alleged injurious effects of "invisible pollution", but does not clearly distinguish the sources or levels of radiation given off by power lines, radio and microwave transmitters, and home appliances when making broad conclusions. Little research is cited that links health effects to electric utility operations.

- Barbara Bagley, resident of the City of Henderson, said that she would be providing a petition of citizens opposed to the WPPP power transmission system. (The petition is included in Section 5.4.6.)

- Shauna Hughes, City Attorney for the City of Henderson, had comments related to the WPPP power transmission system. She also requested a public hearing in the City of Henderson.

Comment LV-14: "I would like to comment for the record, however, that the seven criteria which have been mentioned as having received extensive treatment were absolutely nowhere to be found as those seven criteria affected Hendeson, Nevada itself. . . . Perhaps those seven criterias [sic] adequately addressed the siting of the site but they did not adequately address the transmission corridor issues at all."

Response: Environmental information related to the transmission corridor through Henderson is included in Section 5.4.4 in response to Comment L1-1.

Comment LV-15: "Taking this land away from high value residential development in Henderson will severely impact Henderson socially, economically. Again, however this was not in the Draft EIS so I am making that comment now."

Response: Information on impacts to the City of Henderson is included in Section 5.4.4 in response to Comment L1-1.

- Matt Monroe, resident of the City of Henderson, had comments on the WPPP power transmission system.

  Comment LV-16: "In no studies have I seen you take into account the effect of power lines on people."

  Response: Information on the electrical effects of power transmission lines is included in Section 4.1.8 which has been added to the Final EIS.

- Pat Klinger, resident of the City of Henderson, requested a public hearing in the City of Henderson.

5.3.4 Reno, Nevada

A public hearing on the Draft EIS was held in Reno, Nevada, on November 16, 1983, from 7:08 p.m. to 7:15 p.m. The hearing panel included John Matthiessen, BLM Hearing Officer, and Ronald P. Merlo, WPPP Environmental Engineer. George Foster, representing the Plumbers and Pipefitters Union in Sparks, Nevada, spoke in support of WPPP.

5.3.5 Henderson, Nevada

A public hearing on the Draft EIS was held in Henderson, Nevada on December 15, 1983 from 7:09 p.m. to 8:15 p.m. This meeting had been requested by officials and residents of the City of Henderson both at the November 17, 1983 public hearing in Las Vegas, Nevada, and by letter dated November 14, 1983 from the City Manager of the City of Henderson.

The public hearing in Las Vegas had been adequately publicized both on radio and in newspapers, including the local newspaper in the City of Henderson. However, the BLM agreed to hold a public hearing in the City of Henderson (which is approximately 13 miles southeast of Las Vegas) to allow the residents of the City of Henderson additional opportunity to provide comments.

The hearing panel included Burt J. Stanley, BLM Presiding Officer, and Ronald P. Merlo, WPPP Environmental Engineer. The following are the individuals who presented testimony, a summary of their comments, and responses (where appropriate):

- LeRoy Zike, Mayor of the City of Henderson, had comments on the WPPP power transmission system.

  Comment H-1: "In short, my main concern is the impact this will have on the development land in the area of our city."

  Response: Information on the City of Henderson land use plan is included in Section 5.4.4 in response to Comment L2-5. A two-mile-wide study corridor was selected to allow flexibility in locating the transmission lines. This flexibility includes avoiding, where possible, developable lands.

- Ron Hubel, Mayor Pro Tem of the City of Henderson, had comments on the WPPP power transmission system.

  Comment H-2: "Under all the categories which you have read off that an environmental study has been done, I have not seen any writing addressing any of those issues. . . . It does not tell me what the socioeconomic impact is, it does not tell me what the air impact is, it does not tell me what the land impact is or any of the other categories that you mentioned."

  Response: Environmental information related to the transmission corridor through Henderson is included in Section 5.4.4 in response to Comment L1-1.

- Richard Heckendorf, Planning Director of the City of Henderson, reiterated his comments from the Las Vegas public hearing concerning maps showing city boundaries, the concept of a transmission corridor, and the distribution of power to participants. Additional comments were also presented.

  Comment H-3: "We feel there's been no contact with the City of Henderson officials and we have no record of that."

  Response: On October 24, 1978, a meeting with the Clark County Regional Planning Council included a discussion of the WPPP power transmission system. Ongoing discussions with the City of Henderson on the Intermountain Power Project Conditional Use Permit application (submitted on September 2, 1980) included the WPPP power transmission system.

  Comment H-4: "The benefit to Henderson is not demonstrated."

Response: Benefits to the City of Henderson include the availability of power for future load growth because of the participation of Nevada Power Company in WPPP and the availability of additional tax revenues due to construction and operation of WPPP in Nevada. Additional information on economic benefits to the City of Henderson is included in Section 4.1.7.10 which has been added to the Final EIS.

- Melvin Bagley, resident of the City of Henderson, reiterated his opposition to the WPPP power transmission system as previously presented at the Las Vegas public hearing.

- Bob Anselmo, City Manager of the City of Henderson, reiterated his comments from the Las Vegas public hearing. In addition, he discussed land use and land ownership of City of Henderson land within the transmission line study corridor.

- John Dailey, reporter from the Henderson Home News, presented comments as a private resident of the City of Henderson.

Comment H-5: "I think the inadequacy there is that, if this line must go through Southern Nevada on its way to Southern California, you can easily join other power corridors that are already created over in El Dorado [sic] Valley and easily bypass Henderson if that corridor is expanded."

Response: The transmission corridor in Eldorado Valley is south of the McCullough Switching Station beyond the termination of the WPPP power transmission system.

Comment H-6: ". . . this study does not concern itself with the adverse economic impact to the City of Henderson . . . ."

Response: Information on economic benefits to the City of Henderson is included in Section 4.1.7.10 which has been added to the Final EIS.

- o Francisco Gonzalez, resident of the City of Henderson reiterated his comments from the Las Vegas public hearing concerning electrical effects of transmission lines.
- o Mike Bourn, representing the White Pine County Board of Commissioners, presented comments regarding the tax benefits of WPPP. A copy of the comments and the responses are included in Section 5.4.1.
- o Beverly O'Bringer, resident of the City of Henderson, spoke in opposition to the WPPP power transmission system.
- o Barbara Bagley, resident of the City of Henderson, presented a petition of citizens opposed to the WPPP power transmission system. The petition is included in Section 5.4.6.
- o Robert Hall, resident of the City of Henderson, reiterated his comments from the Las Vegas public hearing concerning electrical effects of transmission lines. Additional comments were also presented.

Comment H-7: "I would ask whether the plant in White Pine County is built to the same specifications of the most stringent pollution laws as passed by California.

Response: WPPP will be constructed and operated in accordance with the requirements of state and federal air permits. It should be noted that existing air quality differs from region to region and the allowable air emissions in one region may be unacceptable in another region. For example, California regulations for the Los Angeles air basin may not be applicable for rural parts of Nevada.

Comment H-8: "Lastly, I would ask that the Bureau of Land Management conduct a thorough cost-benefit analysis."

Response: Under the National Environmental Policy Act, a cost-benefit analysis is not required in an environmental impact statement for a coal-fueled generating facility.

- John Foley, Las Vegas attorney representing Yellow Rose Limited and others, reiterated his comments from the Las Vegas public hearing concerning alternative corridors for the WPPP power transmission system.

- Jim Jensen, owner of Jensen Realty, spoke in opposition to the WPPP power transmission system.

- David Hill, representing some of the property owners in the Mission Hills area, spoke in opposition to the WPPP power transmission system.

- Robert Branch, general partner of Yellow Rose Limited, reiterated his comments from the Las Vegas public hearing.

- Gary Wood, resident of Mission Hills, spoke in opposition to the WPPP power transmission system.

- Charlotte Yakubik, City Councilman [sic] of the City of Henderson, spoke in opposition to the WPPP power transmission system.

- Jim McNutt, resident of the City of Henderson, had comments on the WPPP power transmission system:

  <u>Comment H-9</u>: "I think that the negligence on the part of the EIS is, when it comes to a significant residential area, it neglected the specifics. In other words, it just went into general terms for the entire x-hundred miles, ignoring a critical 10-mile area that should have been more directly targeted . . . ."

  <u>Response</u>: Information on impacts to the City of Henderson is included in Section 5.4.4 in response to Comment L1-1.

- Matt Monroe, resident of the City of Henderson, asked about how questions at the public hearing would be answered. The BLM presiding officer explained that the answers would appear either in a future draft environmental impact statement or in a final environmental impact statement.

5.4 WRITTEN COMMENTS

Forty-eight written comments were received on the Draft EIS, including seven written comments that were presented during public hearings and eleven written comments that were received after the close of the review period. All written comments are reproduced in the following sections. Specific comments are identified and the responses provided.

5.4.1 Hearing Testimony

The following individuals provided written testimony at public hearings on the Draft EIS:

H1 Philip J. Carter - White Pine County Schools

H2 Thomas Lyle Taylor - White Pine Chamber of Commerce

H3 Barlow N. White - City of Ely

H4 C. Brent Eldridge - Board of County Commissioners, White Pine County

H5 Mike Baughman - Resource Concepts, Inc.

H6 Arthur M. Olson - White Pine County, Power Plant Advisory Committee

H7 Michael Bourn - Board of County Commissioners, White Pine County

BOARD OF EDUCATION

WHITE PINE COUNTY SCHOOLS

PHONE 289-4851 • P.O. BOX 400 • EAST ELY, NEVADA 89315

(H1)

PRINCIPALS

November 14, 1983

The White Pine County Board of School Trustees would like to enter the following statement into the official records of this hearing.

Over the last five years, White Pine County has experienced a severe decline in student enrollment. This decline reflects the economic situation within the county. The Board totally supports the project. Our funding is dependent upon student enrollment. There is a tremendous need for new school facilities, at both the elementary and secondary levels. There is also a need to expand educational programs. These needs were addressed in the socio-economic impact plan. The District actively participated in the preparation of this plan and in the negotiations process when these needs were addressed. This project will generate a sound tax base for White Pine County. Further work needs to be accomplished in order to give the school district access to this tax base. The groundwork is already being laid in order to accomplish this.

In preparing for the impacts of the project on the community, a spirit of unity has developed between the city, the county, and the school district. We wholeheartedly approve and support the Environmental Impact Statement as it relates to the District and urge the adoption of this Plan.

Philip J. Carter

Philip J. Carter, President
White Pine County Board of School Trustees

AN AFFIRMATIVE ACTION EQUAL OPPORTUNITY EMPLOYER

White Pine
Chamber of Commerce

Phone: (702)
289-8877

Box 239
Ely, Nevada
89301

(H2)

November 14, 1983

Mr. Merril DeSpain
District Manager
Ely Office, B.L.M.
SR 5, Box 1
Ely, NV 89301

Dear Mr. DeSpain:

The White Pine Chamber of Commerce endorses the Draft Environmental Impact Statement prepared for the White Pine Power Project.

The Chamber of Commerce feels the development of the White Pine Power Project will help to stimulate our economy and provide jobs for our residents. The county has suffered uncertain economic conditions, a loss of retail trade, diminishing tax revenues, and high unemployment since 1978 when Kennecott Minerals Company closed its mining operation and cut its smelter work force drastically. With the closure of the Kennecott smelter in June, unemployment has risen to 16.2% and economic conditions have worsened. Both the construction and operation phases of the power project will generate badly needed jobs and income for the county's residents and businesses.

The potential socio-economic impacts of the White Pine Power Project were determined through an extensive needs assessment process which involved over 100 community members in 13 subcommittees. Following the needs assessment process, the Impact Alleviation Plan was developed and adopted by the City of Ely, White Pine County, and the White Pine County School District. Both the needs assessment and the Impact Alleviation Plan have received a great deal of support throughout the community.

The White Pine Chamber of Commerce feels that the DEIS adequately addresses the community's concerns over the physical and socio-economic impacts of the project and we are pleased to give our continued support for the White Pine Power Project.

Sincerely,

Thomas Lyle Taylor

Thomas Lyle Taylor, President

TLT/jas

CITY OF ELY

BOX 299
ELY, NEVADA 89301

H3

November 14, 1983

To: Bureau of Land Management
Re: DEIS

Tonight I would like to discuss the economic condition of the City of Ely with and without the construction of the White Pine Power Project. According to figures supplied by the State of Nevada, the City of Ely has a population of 5,238 people. Because of the shutdown of Kennecott and the absence of Economic Developement within White Pine County, the City's population is dwindling. Without a stable economic base, taxable sales within the City of Ely will decline causing merchants to raise prices to keep their doors open or eventually and unfortunatley close forever. As the downward spiral continues the City of Ely will recieve less revenues which will affect the services the City now supplies to it citizens.

The construction of the White Pine Power Project will bring a stable economic base to the City of Ely. Instead of the downward spiral, an upward trend will now take affect. Everything from our Local Merchants to City Government will prosper because of the benefit of having the Power Project built in White Pine County. Because of the tax laws in the State the City will realize revenues never before attained and will be able to do projects that will benefit the Citizens of our City as well as visitors. The employment picture in the City of Ely will brighten with the need for increased employment in the support industries.

The White Pine Power Project will also help mitigate problems that will arise from the influx of people during construction and operation. A group of 13 subcommittees were formed to discuss everything from water, sewer and solid waste to recreation to fire protection. After all the needs were identified a negotiating team was formed to discuss and finalize these problem areas. I'm happy to say this negotiating team through many long hours, has come to agreement with Los Angeles Water and Power. This agreement was then forwarded to the City Council and

CITY OF ELY

BOX 299
ELY, NEVADA 89301

the White Pine County Commission for their approval. Again I'm very please to announce that this agreement has been approved by the Ely City Council and the White Pine County Commission.

In closing I would like to express my strong support for the construction of the White Pine Power Project and the many great things it will do for the economy and citizens of the City of Ely.

Barlow N. White
Mayor of the City of Ely

H4

WHITE PINE POWER PROJECT
DEIS
PUBLIC HEARING
ELY, NEVADA
NOVEMBER 14, 1983

STATEMENT BY:
C. BRENT ELDRIDGE
CHAIRMAN
BOARD OF COUNTY COMMISSIONERS
WHITE PINE COUNTY, NEVADA

My name is Brent Eldridge. I am the chairman of the Board of County Commissioners in White Pine County, Nevada. I offer the Board's comments for consideration by the BLM as it reviews the request for land transfers and rights-of-way necessary to the development of the WPPP.

The White Pine Power Project will be owned mostly by White Pine County. It is basically a joint-action undertaking involving the County and the fourteen utilities who are participants in the Project. The financing of the County-owned portion of the Project was made possible in 1979 through the action of the Nevada Legislature. During that session, the Legislature passed, nearly unanimously, amendments to the Nevada County Economic Development Revenue Bond Law which enabled the kind of financial undertaking we are talking about here. The Legislature also approved this project in that action.

The Project has the overwhelming support of the people of White Pine County. Obviously, it also has the support of the Nevada Legislature. And it has benefitted from the support of the current governor, Richard Bryan, and the immediate past two governors of Nevada, Robert List and Mike O'Callahan.

The Project enjoys such support due to the extremely depressed economic conditions in White Pine County and in other areas in Eastern Nevada. We here in the County also are very supportive of the Project because of our experience with the Development Manager, the Los Angeles Department of Water and Power, and many of the Project participants over the past five years while this project has been in various stages of development. They have been straightforward and willing to recognize and discuss many concerns raised here in the community.

Twenty-five percent more people lived in White Pine County in 1970 than in 1980. While Nevada's population swelled and its economy boomed during those ten years, our population contracted and our economy foundered. This was due to the ceasing of mining operations by Kennecott beginning in 1976. Today, because the world price of copper is so low, even the McGill Smelter is not operating. We have been fortunate to have two new mining operations start-up in the County since 1978, the Amselco/NERCO Alligator Ridge project and Silver King's Taylor and Ward projects. We are grateful for these new operations. However, even with these new operations, our population stands about twenty percent below what it was in 1970. I hate to think of what our situation would be if it were not for these new mining ventures.

We have not sat by idly to await our fate. We have worked diligently to attract new employment to the County. The Power Project is being proposed here at the invitation of the people of White Pine County. We also have developed an industrial park and are working to attract other employers. But it is a difficult undertaking. We do not have many of the advantages possessed by many of the communities across the country with whom we must compete for new facilities. We are isolated. The closest interstate highway is 120 miles away. We are not located on a main rail line. We do not have a large diversified labor force; when people lose their jobs here, they have to move on.

We do have some advantages, however. Our remoteness is an attractive feature for location of a power plant. We do have rail facilities into the community. We have been a heavy industry area for most of our history. And we have a very stable work force. In fact, there

are a lot of folks who are waiting for the opportunity to return to the County. We welcome new industry to our area.

We see the WPPP as a good start toward revitalizing our economy. In fact, we see it as essential to our future. We believe that when our economy is growing again due to the Project, we'll be able to present a much better image to prospective new employers. As I said before, it's tough to attract new business in an isolated area, but it's doubly difficult if the community seems also to be going downhill.

This is a big project and it will bring a lot of new people into the area very rapidly during construction. That means a lot of socioeconomic impact. We recognize this and so do the Project participants. That is why we began working on an impact alleviation plan nearly two years ago. The work on that plan was completed this summer and the plan has been approved by the political entities in the County. We expect it to be approved by the project participants shortly. The plan's development involved a large number of local people and we are very satisfied with it. The plan does not address impacts on agricultural producers but such a plan is to be developed betwwen the County and the Project participants. The work on that plan will get underway before the year is over. We commend the Project Development Manager for the openness of the process and the quality of the planning to date.

Finally, I would like to compliment the BLM, LADWP and Dames and Moore for the quality of the DEIS. It is one of the better documents of its kind that I have reviewed.

In closing, let me reiterate that this project is vital to White Pine County's economic future; our survival as the community we are today depends upon it.

I and my fellow County Commissioners appreciate this opportunity to present our views.

H5

STATEMENT OF
MIKE BAUGHMAN
RESOURCE CONCEPTS, INC.
AT THE
NOVEMBER 14, 1983
PUBLIC HEARING CONCERNING THE
DEIS FOR THE WPPP
IN
ELY, NEVADA

My name is Mike Baughman. I am project manager with Resource Concepts, Inc., here today representing the Agricultural Subcommittee of White Pine County (hereinafter referred to as the Committee). The Committee is a subcommittee of the White Pine County Power Plant Advisory Committee. The Committee was created to evaluate White Pine Power Project (WPPP) impacts on the agricultural community in White Pine County and to assist WPPP planners in developing mitigation and impact monitoring framework. To this end, White Pine County retained Resource Concepts, Inc., to provide technical assistance to the committee.

The Agricultural Community of White Pine County is concerned about possible adverse impacts on agricultural resources which may occur as a result of construction and operation of WPPP. These comments have been prepared and are being presented for the consideration of the Bureau of Land Management pursuant to its finalization of the Environmental Impact Statement to support construction and operation of WPPP.

H5-5

H5-1 Table 2 - Summary of WPPP impacts - does not indicate that groundwater withdrawals and subsequent lowering of water tables will create a socioeconomic impact upon the agricultural sector of White Pine County.

Page 3-27, Section 3.1.3.2.5 Agriculture and Ranching

Paragraph 1 of this section indicates that by the mid-1870's, ranching and agriculture had reached a developmental plateau. Paragraph 2 of this section indicates that not until the 1890's were agricultural settlements such as Lund, Preston and Baker established, signaling a period of marked expansion in the ranching and agriculture industries.

Response to Comment H5-1: Table 2 in the Summary has been revised in the Final EIS to indicate the potential for impacts to agriculture.

H5-2 The two paragraphs appear to contradict one another. On what factual basis is an 1870 development plateau based? Since 1870, high rates of public and private investment have continued to develop the agricultural industry in White Pine County.

H5-3 Page 4-1, Section 4.1.1 Earth Resources should be expanded to include increased erosion due to removal of vegetation.

H5-4 Page 4-31, Paragraph 3 indicates that moderate impacts to sub-irrigation levels in Steptoe Valley would occur only in the immediate vicinity of the well fields. Review of Figure 4-1 indicates that these impacts may occur as far as 4-5 miles away from the well field. It should be noted that only through a comprehensive monitoring program can the extent of Project impacts to water resources be fully understood. The term immediate in the text should be either defined or deleted.

Page 4-75, Paragraph 1 of Section 4.1.7.9.1 Land Productivity, states "However it is not possible to accurately calculate affected AUM's associated with migratory type operations." Because acceptable methods for estimating these indirect AUM impacts were discussed by the Agricultural Subcommittee with the EIS preparation team, the Committee is disappointed that the analysis of indirect impacts was not carried further.

H5-6 Page 4-74 and 4-75, the last sentence on page 4-74 and continuing on to page 4-75 indicates that a discussion of the impacts of WPPP on agricultural water resources is included in Section 4.1.2.1.3. A review of the DEIS indicates that the cited section is not included within the document. At no point within the DEIS does there appear to be a discussion of how groundwater drawdown impacts will affect hay yields, particularly where hayfields are located over a perched water table.

Response to Comment H5-2: Agriculture and ranching are discussed in Section 3.1.5.2.5 of the Draft EIS. As noted in this section, ranching and agriculture first developed in the County as local support industries for the surrounding mining camps. As mining began to decline in the 1870s, ranching and agriculture reached a development plateau due to the decreasing size of the local market and the lack of affordable transportation to outside markets. A shift in emphasis toward sheepherding, steadily improving access to outside markets, and the establishment of Mormon farming communities during the 1880s and 1890s finally allowed this early plateau to be transcended. Additional discussion of ranching and agriculture in County history is included in Section 3.3 of the Cultural Resources Baseline technical report.

Response to Comment H5-3: Because impacts on soils are discussed as a part of ecological resources, erosion was included in Section 4.1.4 of the Draft EIS.

Response to Comment H5-4: Section 4.1.4.3 has been revised in the Final EIS.

Response to Comment H5-5: The ability to accurately estimate animal unit months (AUMs) associated with migratory-type operations is difficult because of the transitory nature of the movements. The total AUMs affected by the railroad corridors (the principal impact on migratory-type operations) were included in Section 3.2.7 of the Draft EIS. Indirect impacts would be represented by the extent to which migratory cattle and sheep depend on these AUMs.

Response to Comment H5-6: The reference in the Draft EIS is to Section 4.1.3.1.2. The correct reference should have been Section 4.1.3.2 which was included in the Draft EIS. The Final EIS has been corrected. The extent to which groundwater drawdown affects hay yields is not known. Any impact would be mitigated as a part of the Impact Alleviation Plan for agricultural producers. Additional information on this plan is included in the response to Comment H5-11.

Page 4-74 and 4-75 - The last sentence on page 4-74 and continuing onto page 4-75 states "Two significant agricultural issues that emerged were the potential impact of WPPP on agricultural water resources (discussed in section 4.1.3.1.2) and the effect of WPPP on livestock grazing maintenance and management as the result of removing land from forage production." The text continues, "This impact is addressed in the following sections in a general manner to allow individual ranchers (permittees), the lessor (BLM), and WPPP flexibility in determining the extent to which specific mitigative measures to be identified will be necessary and acceptable."

H5-7 Because it is not possible to determine the extent to which specific mitigation measures are necessary or acceptable without first having estimated specific impacts, the Agricultural Subcommittee believes that a more complete and quantified analysis of potential impacts to agriculture must be prepared prior to the implementation of an effective impact alleviation plan.

Page 4-75 - Paragraph 2 of Section 4.1.7.9.1 Land Productivity, indicates that hay or alfalfa could be produced in areas within each impacted allotment as a means to make up lost forage. Unless Bureau of Land Management policy and regulations have recently been modified, it is presently not possible to grow hay and/or alfalfa on these grazing allotments. The text reasons that because this type of mitigation is possible, impacts related to AUM's, or land productivity are anticipated to be insignificant.

H5-8

While the Agricultural Subcommittee recognizes that a detailed analysis of potential impacts to agricultural producers was not possible in the preparation of the DEIS, the lack of a detailed analysis also precludes the determination that impacts related to AUM's or local productivity are anticipated to be insignificant. The Committee believes that all reference to insignificance as relates to agricultural impacts should be deleted from the DEIS.

H5-9

Response to Comment H5-7: It is not possible to predict all of the specific impacts that could occur to individuals as a result of drawdowns associated with WPPP operation. Therefore, an Impact Alleviation Plan for agricultural producers is being developed. Additional information on this plan is included in the response to Comment H5-10.

Response to Comment H5-8: The Bureau of Land Management could not, under present policy or regulations, agree to take acreage from allotments for hay and forage production to compensate for losses caused by WPPP. WPPP, however, would be in a position to compensate for losses in animial unit months through acquisition of hay or improved pasturelands from nonfederal sources to equal the production lost due to WPPP construction and operation.

Response to Comment H5-9: The purpose of the Impact Alleviation Plan is to provide a framework within which impacts on individual agricultural producers will be determined and agreements for mitigation of these impacts will be developed and implemented. Therefore, impacts to animal unit months are anticipated to be insignificant.

Because the ability of agricultural producers in White Pine County to co-exist with the WPPP will depend largely upon the mitigation of impacts, It is Imperative that mitigation measures proposed within the DEIS and those which are identified through the implementation of an impact alleviation plan be functionally and institutionally practical. The production of alfalfa on Bureau of Land Management grazing allotments is not considered a practical mitigation alternative.

An example of just how significant the impacts of lost AUM's could be follows:

Table 4-13, which Is not referenced in the text of the DEIS, indicates that the loss of AUM's on the Cherry Creek allotment will be 289. This represents 5 percent of the total allotment AUM's. Because the Cherry Creek allotment Is only utilized for an estimated six months each year, the 289 AUM's will require that use of the allotment be reduced by 48 animal units. The loss of 289 AUM's or 48 animal units may, in fact, be quite significant when one considers the following points.

A. Five individual ranching enterprises utilize the Cherry Creek allotment. As such, it is quite possible that each permittee has designated use areas within the allotment. If this is the case, the impact of the lost AUM's may be concentrated upon one operator.
B. Based upon estimated net returns to land and management per AUM of $9.05, a loss of 289 AUM's would redeuce the net returns by approximately $2,600 annually.
C. Based upon a value of $6.61 per AUM, reductions in rancher wealth resulting from a loss of 289 AUM's would equal $20,227, distributed between one to four operators.

H5-10 Page 4-76, Section 4.1.7.9.2 Livestock Management, implies that the magnitude of impacts to livestock management cannot presently be assessed. The importance of assessing these Impacts prior to the implementation of an impact allelvation plan should be noted in the DEIS.

Response to Comment H5-10: A purpose of the Impact Alleviation Plan is to assure that impacts that cannot be accurately assessed are properly mitigated.

H5-11 In March of 1982, Mr. Brent Eldridge, representing the Agricultural producers in White Pine County, presented the Bureau of Land Management with a listing to be considered in the Environmental Impact Statement for WPPP. A copy of Mr. Eldridge's statement is attached to and made a part of these comments. Review of the DEIS by the Agricultural Subcommittee finds that few of these issues have to date been sufficiently analyzed.

In summary, the Agricultural Subcommittee had hoped that the Draft EIS would include a more complete and quantified (as was included for population, employment, housing, etc.) analysis of the possible impacts of the WPPP on agriculture in White Pine County.

The Agricultural Subcommittee now recognizes that a quantified analysis of the impacts for all agricultural issues identified during the scoping process can only occur through the implementation of an impact alleviation plan for agriculture. To help ensure that this plan is subsequently developed, the Agricultural Subcommittee requests that a memorandum of understanding between White Pine County and the Development Manager be prepared and executed. The Subcommittee would further request that the memorandum be developed by January 3, 1984, the date through which public comments to the subject DEIS will be accepted. The Committee's concern is premised by the fact that agriculture's importance is often overlooked and the potential impacts of any new project on agirculture often are not well understood and, therefore, not thoroughly evaluted.

The agricultural producers of White Pine County are possibly the only segment of the population which are being asked to give something up (be it water, vegetation, income, or a way of life) so that all people in the county can share in the many positive benefits associated with WPPP. In order for the members of the Agricultural Community and the Agricultural Subcommittee, in particular, to develop responsive impact monitoring and mitigation plans, a thorough analyses of just what it is they may be giving

Response to Comment H5-11: Comments provided during the scoping process by the agricultural producers of White Pine County were divided into five categories. The categories are: 1) environmental impacts; 2) economic impacts; 3) social impacts; 4) mitigation; and 5) impact monitoring.

Environmental impacts on agriculture were discussed in Section 4.1.7.9 of the Draft EIS. Impacts on ecological resources that are related to agriculture (e.g., erosion and halogeton invasion) were discussed in Section 4.1.4 of the Draft EIS. Information on impacts from groundwater withdrawal and monitoring was included in Section 4.1.3 of the Draft EIS.

The above sections have been revised in the Final EIS to provide additional information. In general, impacts to agricultural producers would be on an individual basis and the application of mitigation would be dependent on the location and severity of the impact. Because of this, work is ongoing with members of the Agriculture Subcommittee to prepare the agricultural industry part of the Impact Alleviation Plan. To assist in this work, a Memorandum of Understanding (MOU) between White Pine County and the Development Manager was signed in December 1983. The MOU includes the contents of the plan and the procedure for implementing the plan. The final plan will be a framework within which impacts on individual agricultural producers will be determined and agreements for mitigation of these impacts will be developed and implemented.

up is necessary. The Committee has prepared these comments in an effort to assist the Bureau of Land Management and The Development Manager for the Project in structuring their approach to quantifying specific impacts to agricultural producers. These comments should not be interpreted as opposition to the WPPP but as an attempt to ensure the protection of existing rights of agricultural producers in White Pine County.

Thank you.

My name is Brent Eldridge. I am Chairman of the White Pine County Board of County Commissioners and also a rancher in Spring Valley. I am here to present a statement on behalf of the agricultural producers in White Pine County. In doing so, I am acting as a member of that agricultural community and not in any official capacity as an elected official. I also want to stress that my presentation of the issues of concern to the agricultural community does not mean that my interests regarding the proposed project are confined to that area. As a County Commissioner, I am concerned about the welfare of all of the people of White Pine County. However, this is the area of potential impact which I am best qualified to represent and there are others who also will speak tonight who are better qualified to adress other areas of potential impact.

The Agricultural Community in White Pine County is concerned about possible adverse impacts on agricultural producers which may occur as a result of construction and operation of the White Pine Power Project. These comments have been prepared to identify the types of impacts which may occur so that they might be addressed in the environmental impact study.

The presentation of these issues should not be interpreted as an expression of opposition to the Project. The issues cited are potential areas of impact. They are genuine concerns of the Agricultural Community and they must be addressed in order to determine the degree to which they may be impacts in this project so that the interests of agricultural producers in White Pine County, as well as those in other counties through which lineal components of the Project may pass, will be protected. These issues are being raised at this time to ensure they are recognized and will be addressed during the preparation of the EIS, mitigation plan, and impact monitoring plan. The White Pine Power Project is important to White Pine County's future as is the continued contribution of agriculture to that future.

The issues are divided into five categories: (1) Environmental Impacts, (2) Economic Impacts; (3) Social Impacts; (4) Mitigation and (5) Impact Monitoring.

I. ENVIRONMENTAL IMPACTS

A. Effects of Changes in Land Use to Agricutural Producers

1. Disturbance of rangeland vegetation and soils during construction may result in the invasion of Halogeton and/or other invader or undesirable plants which can be harmful to live stock. Will the Project contribute to the invasion by these species and, if so, what control measures will be utilized?

2. Will construction of the Project contribute to the potential for erosion as a result of disturbances to rangeland vegetation and soils? What impacts will project-related erosion have on existing roads and range improvements?

3. What effect will project related construction equipment have on existing improved and unimproved roads utilized by agriculture producers? Who will assume responsibility for maintenance of roads during construction and operation?

4. To what extent will disturbances to rangeland vegetation, soils, and natural watersheds during construction of the project contribute to flash flooding hazards?

5. How many acres of public and private rangeland will be taken out of grazing and used as Power Plant site, roads, well field enclosures, railroad corridors, powerline corridors, and water pipelines? How many AUMs of grazing will the total acres used represent?

6. Will any private cropland be taken out of production to construct the power plant and associated lineal facilities? If so, to what extent will yields of hay and/or other crops be reduced as a result of taking private cropland out of production?

7. What effect will the construction and operation of the power plant and associated lineal facilities have on the carrying capacity and management of agricultural opertions dissected by project components, if such occurs?

8. To what extent will construction and operation of the project disrupt normal livestock driveways?

9. To what extent will the project affect the status of Desert Land Entry or Carey Act applications filed by agricultural producers in the County?

10. To what extent will range conditions be degraded within project construction zones, but outside of specific facility sites? What measures will be taken to minimize peripheral disturbances to vegetation and soils in the construction zone?

11. To what extent will indiscriminate off-road vehicle traffic by project related construction and recreational vehicles impact rangeland vegetation and soils? What measures will be taken to cntrol indiscriminate ORV traffic?

12. Will Project related lineal facilities impair the access of agricultural producers and livestock to agricultural land use area? if so, what measures will be taken to alleviate access problems?

13. What affect will project stimulated land use changes (i.e. housing) have on agricultural producers? It is possible that privately owned parcels near proposed power plant sites will be developed in response to the project?

14. Where will related barrow pits be located? How many acres and AUMs will be taken out of grazing by barrow pits?

B. Water Related Impacts to Agricultural Producers

1. To what extent will ground water drawdown occur as a result of the project?

2. To what extent might contamination of surface or groundwater occur as a result of the project?

3. To what extent might springs and/or meadow areas in the vicinity of project well fields be degraded?

4. To what extent might riparian zones be degraded in the vicinity of project well fields?

5. To what extent will the project result in livestock being separated from water sources?

6. To what extent will normal livestock distribution by water sources be impaired?

7. What will be the net reduction of public and private water supplies? How will development of the project affect future agricultural development opportunities?

8. How much water will be required to construct the power plant and lineal facilities? What is to be the source of construction related water?

II. ECONOMIC IMPACTS

A. To what extent will net incomes to agricultural producers be affected by potential:

1. Losses in public and private AUMs
2. Reductions in hay or other cropland yields
3. Increased livestock management costs
4. Increased labor costs
5. Increased irrigation pumping costs
6. Increased material, supply, and fuel costs
7. Increased supplemental feed requirements
8. Increased livestock death losses resulting from rustling, vandalism, railroad kills, highway kills, and poisonous plants.

B. To what extent will losses in public or private range and croplands affect the net worth of agricultural producers?

C. How will the loss or change in availability of public and private land and water resources resulting from the project affect the agricultural producers ability to utilize remaining ranch resources? How will project related impacts affect the balance of the combination of resources which constitute various agricultural operations? For example, if certain amounts of winter forage are lost, equivalent amounts of summer range might have to go unused.

III. SOCIAL IMPACTS

1. To what extent can vandalism to public and private property utilized by agricultural producers be expected to increase as a result of the project?

2. To what extent can the rustling of livestock be expected to increase as a result of the project?

3. To what extent can theft of personal property belonging to agricultural producers be expected to increase as a result of the project?

4. To what extent will the frequency of trespass on lands belonging to agricultural producers be expected to increase as a result of the project?

5. To what extent will the potential for violent crimes against agricultural producers, employees, and their families be expected to increase as a result of the project?

IV. MITIGATION

A. The development and implementation of a comprehensive mitigation plan is needed which addresses at least the following:

1. Requirements for increased security to offset potentials for increased crime.

2. Design and installation of range improvements such as seedings, water developments, and fencing.

3. Provision of railroad underpasses and crossings, gates, and cattle guards.

4. The potential for private land acquisitions being offset by compensation of Federal, State, or County land transfers.

5. Provisions for development of new irrigated lands.

6. Opportunities for utilizing water for livestock and irrigation from the power plant system.

7. Problems associated with revegetating rangelands.

8. The need for range improvement/mitigation research.

9. The lead time necessary to implement certain mitigation practices to offset impacts.

V. IMPACT MONITORING

A. The development and implementation of a comprehensive impact monitoring plan is needed which addresses at least the following:

1. Impacts to surface and groundwater resources of agricultural producers.

2. Impacts to rangeland resources utilized by agricultural producers.

3. Social impacts to agricultural producers.

4. Economic impacts to agricultural producers.

5. Success of mitigation actions toward mitigating impacts to agricultural producers.

6. Monitoring over both the short and long term.

In addressing these issues, it is strongly recommended that all agricultural producers potentially impacted by construction and operation of the power plant and its component systems be contacted and consulted during the EIS process. To facilitate that, a list of permitees and operators in the vicinity of the three potential plant sites and along proposed lineal facilities is attached to this statement.

Finally, it should be recognized that the construction and operation of the Project will alter the lifestyle of the citizens of the area. While the increased employment and economic opportunities will be more than welcome, the population increases will reduce the opportunity for solitude and increase the competition for use of the open land. In some fashion, that negative aspect of the growth brought about by the Project should be addressed and weighed against the economic opportunities created.

In closing, let me stress that the raising of these issues should not be interpreted as opposition to the project. It is merely an effort to participate meaningfully in this scoping process on behalf of the agricultural community in White Pine County. Agriculture's importance is often overlooked and the potential impacts of any new project on agriculture often are not well understood and, therefore, not thoroughly evaluated. By raising these issues in substantial detail, the potential for a less than thorough evaluation is avoided.

As a matter of policy, it is hoped that wherever and whenever adverse impacts are identified, all reasonable steps will be taken to avoid the impacts; that where the impact cannot be avoided, steps will be taken to minimize them. If some impacts--and certainly there will be some--cannot be avoided, they should be alleviated in the best possible fashion and alleviation measures should be developed with the participation of the impacted party or parties.

Thank you.

WHITE PINE POWER PROJECT

DISTRIBUTION OF POTENTIAL SITE AND LINEAL FACILITIES IMPACTS BY GRAZING ALLOTMENT AND LIVESTOCK OPERATOR (BUTTE VALLEY SITE)

		TYPE OF POTENTIAL IMPACT				
IMPACTED ALLOTMENT	IMPACTED OPERATOR	POWER PLANT SITE (9 sq.mi.)	WELL FIELD	WATER SUPPLY SYSTEM	RAILROAD	POWER TRANSMISSION LINE
1. Cherry Creek	Bill Lear Gordon Fopplano Salvi Ranchos Rodrick McKay		X	X		
2. Telegraph Creek	Bertrand Paris			X		
3. Medicine Butte	Paris & Sons		X	X	X	
4. Thirty Mile	Gracian Uhalde	X	X	X	X	X
5. South Butte	Warren Robison		X	X		X
6. Heusser Mt.	Lindly Ranch Co.					X
7. Georgetown Ranch	Flying Diamond Ranches Inc.					X
8. Copper Flat	S & H Ranches					X
9. West Schell Bench	S & H Ranches					X
10. Schellbourne	Marvin Jessen		X	X		
11. North Steptoe	Ray Staley		X	X		
12. W. Becky Creek	Melvin Gardner Ray Staley		X	X		
13. Big Indian Ck.	Martin Magnuson		X	X		
14. Whiteman Ck.	Melvin Gardner Marion Johnson		X	X		
15. Duck Ck. Flat	Laucirica Livestock Co.		X	X		
16. Moorman Ranch	Robert Olckenson				X	
17. Tom Plain	Gardner Ranches Inc.				X	
18. Badger Springs	Gracian Uhalde					X
19. Jakes Unit Trail	Gracian Uhalde Paris & Sons				X	
20. Indian Jake	Tom Rosevear Walt Rosevear				X	
21. Giroux Wash	S & H Ranches					X
22. White Rock	Joseph Peacock Van C. Gardner Virginia Gardner Van J. Gardner				X	X

WHITE PINE POWER PROJECT

DISTRIBUTION OF POTENTIAL SITE AND LINEAL FACILITIES
IMPACTS BY GRAZING ALLOTMENT AND LIVESTOCK OPERATOR
(BUTTE VALLEY SITE) Continued

		TYPE OF POTENTIAL IMPACT				
IMPACTED ALLOTMENT	IMPACTED OPERATOR	POWER PLANT SITE (9 sq.mi.)	WELL FIELD	WATER SUPPLY SYSTEM	RAILROAD	POWER TRANSMISSION LINE
23. Preston	Nathan Maynard Thomas Rosevear Glen Lane					X
24. North Cove	Phillip J. Carter			X	X	
25. Douglas Point	Frank Reid					X
26. Big Six Well	Phillip J. Carter					X
27. Swamp Cedar	Albert Gubler					X
28. Sheep Pass	Kenneth Whipple John Whipple				X	
29. Nine Mile	Kenneth Whipple John Whipple				X	X
30. Tamberlaine	El Tejon Cattle Co.					X
31. Little White Rock	S & H Ranches					X
32. White Rock (West)	Joseph Peacock Van C. Gardner Virginia Gardner Van J. Gardner					X
33. Cattle Camp Cave Valley	Phillip J. Carter Ernest Gubler Frank Reid					X
34. Cave Valley Ranch	Wallace Dill					X
35. Shingle Pass	Unelco					X

WHITE PINE POWER PROJECT

DISTRIBUTION OF POTENTIAL SITE AND LINEAL FACILITIES
IMPACTS BY GRAZING ALLOTMENT AND LIVESTOCK OPERATOR
(SPRING VALLEY SITE)

		TYPE OF POTENTIAL IMPACT				
IMPACTED ALLOTMENT	IMPACTED OPERATOR	POWER PLANT SITE (9 sq.mi.)	WELL FIELD	WATER SUPPLY SYSTEM	RAILROAD	POWER TRANSMISSION LINE
1. Geyser Ranch	Fred Jenkins				X	X
2. Willow Springs	Reed Robison		X	X	X	X
3. Scotty Meadows	G. Kirkeby	X			X	
4. Majors	El Tejon Cattle Co.	X	X	X	X	X
5. Bastian Creek	N/A				X	
6. Nigger Creek	Rogers Brothers		X	X	X	
7. Muncy Creek	Eldrige & Sons				X	
8. Red Hills	Melvin Gardner				X	
9. Tippet Pass	B. Rosevear				X	
10. Tippet	Melvin Gardner B. Rosevear				X	
11. Chin Creek	Reed Robison				X	
12. Becky Spring	Bill Lear				X	

(H6)

WHITE PINE POWER PROJECT
DEIS
PUBLIC HEARING
ELY, NEVADA
NOVEMBER 14, 1983

STATEMENT BY:
ARTHUR M. OLSON
CHAIRMAN
WHITE PINE COUNTY
POWER PLANT ADVISORY COMMITTEE

PRESENTED BY:
CLARA FONDI

My name is Clara Fondi. I am a member of the White Pine County Power Plant Advisory Committee. I am presenting this statement on behalf of the chairman of the Committee, Art Olson, who is unable to be present this evening due to a conflicting meeting of the Nevada State Board of Pharmacy in Las Vegas. He is a member of that Board and his presence is required at that meeting. He sends his apologies for not being able to present this statement personally.

This Committee was appointed in 1978 by the White Pine County Board of County Commissioners. Our responsibility is to advise the Board on matters concerning the Project. The Committee has 35 members, meets regularly to receive reports on the Project and discuss matters concerning the Project, and has had considerable involvement in the planning for impact alleviation. The Committee's members represent all

aspects of community life and each was appointed because he or she could represent the viewpoint of one or more groups in the community. A list of the members of the Committee and their areas of representation is attached for your information.

The White Pine Power Project is of vital importance to the economic future of the County! As you may be aware, the participants in this project didn't come to this County and indicate they might want to site an electric generating plant here; we went to them. That may seem unusual in these times when it seems communities across the country are rejecting heavy industry. But we have always relied on heavy industry as the backbone of our economy and welcome such development for the tax base and jobs it creates. You will find, if you walk around this community, an almost unanimous support for this Project. It is our hope for the future.

Having said that, I need to tell you that the job of my Committee has been to determine whether this is as good a deal as it appears to be and whether the positive benefits will outweigh the negative impacts. We believe that this is the case: the Project creates much more good than it does harm. Further, we believe the DEIS documents this rather clearly.

It is not easy to examine a situation such as this one in an impartial manner when you know that the Project represents the economic salvation of the County. But I believe our Committee has been pretty objective in reviewing the Project and the actions and intentions of the participants over the past five years.

We have always felt that the Project should be responsible for mitigating its unavoidable impacts. The impact alleviation plan mentioned in the DEIS does an excellent job of providing for that. The impact assessment work that led to the development of that plan was carried out by our Committee and involved a significant number of others in the communtiy.

We also have been of the opinion that the Project should not create a hardship for individuals, families or groups within the community even though the majority might benefit. The impact alleviation plan to be developed pertinent to agricultural producers and the housing plan in the existing impact alleviation plan together go a long way toward achieving that goal.

Our experience with the development manager of the Project has been a good one. We have been kept informed, on a timely basis, of developments regarding the Project. We feel that our input to their planning

process has been given full consideration. From our point of view, one might characterize the community's relationship with the development manager as the kind of ideal relationship that should exist in any community when a major project is proposed.

I have reviewed the DEIS in some detail. I am very pleased with the document. It touches on every area and indicates that the Project is a sound proposition that will not create unacceptable impacts on the community or the environment.

I would like to thank the Bureau of Land Management for the opportunity to present these comments and the hearing officials for their kind attention while I read these remarks into the record.

WHITE PINE COUNTY
POWER PLANT PROJECT ADVISORY COMMITTEE

CHAIRMAN		
Art Olson	Box 630 - Ely 89301	289-3010
VICE CHAIRMAN		
Harvey W. Young, Jr.	Box 629 - Ely 89301	289-4473
MEDICAL		
Larry Dunton	Box 306 - E. Ely 89315	289-4817
LABOR		
Dale Egbert	Box 561 - McGill 89318	235-7398 (H) 235-7741 (W)
CHAMBER OF COMMERCE		
Lyle Taylor	1184 Mill Street - Ely 89301	289-8246
OUTDOOR GROUPS		
Albert Stone	Box 292 - Ely 89301	289-2900
CHURCHES		
Dean Brunson	Box 1287 - McGill 89318	235-7741
Larry Cluff	Box 848 - Ely 89301	289-2174/289-8345
Father John Coen	Box 16 - Ely 89301	289-2201
MEDIA		
George Carnes	33 Connors Ct. - Ely 89301	289-4491
FARM BUREAU FEDERATION		
Van Gardner	Lund - 89317	238-5338
SCHOOLS		
Kaye Kirkeby	Box 690 - Ely 89301	289-4521
WOMEN'S ORGANIZATIONS		
Clara Fondi	Box 803 - Ely 89301	289-4426
Melba Swain	Box 277 - Ely 89301	289-4048
ASSEMBLY		
John Polish	675 Murry - Ely 89301	289-4591
SENATE		
Rick Blakemore	Box 677 - Tonopah 89049	
GAMING		
WATER		
Van Peterson	Star Route 2 - Preston Ely 89301	238-5292
SMALL BUSINESS		
Bob Miller	Box 1169 - Ely 89301	289-4461
BANKING		
Albert Gianoli	Box 479 - Ely	289-4441
KENNECOTT		
Ralph Orgill	Box 412 - E. Ely 89315	235-7741/289-4659
MT WHEELER		
Tom Bath	Box 1290 - Ely 89301	289-3083
PROJECT COORDINATION		
Mike Bourn	Box 135 - Ely 89301	289-3065
CITY OF ELY MAYOR		
Barlow White	Box 688 - Ely 89301	289-8700
CITY CLERK		
Bob Spellberg	Box 363 - Ruth 89319	289-2430

REGIONAL PLANNING COMMISSION		
Nancy Swallow	% Eastern Nevada Reelty 618 Aultman - Ely 89301	289-8851
WOOL GROWERS ASSOCIATION		
Gracian N. Uhalde	Box 88 - Ely 89301	289-4802
NEVADA CATTLEMEN'S ASSOCIATION		
Joe Pescio	Box 713 - McGill 89318	235-7240
AGRICULTURAL COMMUNITY		
Bill Davidson	Box 1077 - McGill 89318	235-7466
SUBCOMMITTEE CHAIRMEN ADDED TO THE ADVIVISORY COMMITTEE		
Jack Smith	Box 900 - Ely 89301	289-8373
Allan Dalbey	Box 353 - East Ely 89315	289-3304
Marc Picker	Box 541 - McGill 89318	289-4491
Bob Marcum	Box 6 - East Ely - 89315	289-2767
OTHERS		
Margaret Rowe	Box 443 - Ruth 89319	289-3445
Doug Hawkins	Box 776 - Ely 89301	289-2325
EX OFFICIO		
Brent Eldridge	Star Route 1 - Box 42 - Ely 89301	591-0333
J. Kendall Jones	Box 770 - Ely 89301	289-4816
Jay Henriod	Box 709 - East Ely 89315	289-8697
Archie Robison	359 Parker Avenue - Ely 89301	289-2696
Wayne Cameron	Box 533 - Ruth 89319	289-3369

(H7)

WHITE PINE POWER PROJECT
DEIS
PUBLIC HEARING
HENDERSON, NEVADA
DECEMBER 15, 1983

STATEMENT BY:
MICHAEL BOURN
ON BEHALF OF THE
BOARD OF COUNTY COMMISSIONERS
WHITE PINE COUNTY, NEVADA

My name is Michael Bourn. I am a resident of Ely in White Pine County where the White Pine Power Project generating plant is proposed for construction. I work for White Pine County and am here representing the White Pine County Board of County Commissioners.

The White Pine Power Project will be owned mostly by White Pine County and the electricity will be sold to Nevada and California utilities. The Project will benefit White Pine County and that is the reason the County sought it. White Pine has gone through tremendous economic difficulties since 1977 when Kennecott began closing down its mining operations in the County. We have lost 20 % of our population and over 1200 skilled, high-paying jobs. During this time, Nevada has become the fastest growing state in the nation. Much of that growth has been occurring right here in Clark County.

White Pine County is isolated. It is not on an interstate highway or main rail line. It is tough to attract new businesses to the County. We need this Project. We need its jobs, payroll and tax base. It represents economic survival for us.

The interesting thing is that as important as this Project is to White Pine County, most of the benefits will go to the rest of the State. Let me repeat that. Most of the benefits of the White Pine Power Project will be realized by the people of the State of Nevada who do not live in White Pine County!

Over the operating life of this Project, sales tax revenues from coal purchases alone are estimated at over 920 million dollars. Only 7 % will go to White Pine County. Over 89 % of all city-county relief taxes and local school support taxes paid by the Project during its operating life will be distributed to other Nevada counties and to cities outside White Pine County. Clark County is one of those and so is the City of Henderson.

The lion's share of these tax revenues distributed to local governments will come right here to Clark County. Over 313 million dollars will be distributed to Clark County from taxes on coal purchases alone. Henderson will receive nearly 10 million dollars directly and benefit from another 6 1/2 million dollars of over 125 million dollars received by the Clark County School District.

All of these numbers take inflation into account and cover the 37-year operating life of the White Pine Power Project.

The figures presented so far deal only with tax revenues from coal purchases. There will be substantial additional purchases over the operating life of the Project.

The Project will have an assessed value of over 800 million dollars when it begins operation. Less than 11 % of that assessed valuation will go on White Pine County's tax roll. Nearly 417 million dollars will go on Clark County's tax roll and nearly 22 million dollars on Henderson's tax roll. In the first year of the plant's full operation, the Clark County School District will collect over 3 million dollars in property taxes from the White Pine Power Project. Yet, the Project will not cause the addition of a single student to that District's schools. In contrast, the White Pine County School District will collect 650 thousand dollars from the Project in property taxes in

that same year.

In White Pine County, we do not necessarily like the present distribution scheme for the tax revenues and assessed value of the Project. We would like to improve it in our favor. However, even if we are able to achieve that, it is highly unlikely that White Pine will ever recieve more than 25 %. That always leaves Clark County with the lion's share.

The tax revenues from this Project will benefit all the people of the State of Nevada. That fact has not been brought out well enough in the DEIS or these public hearings. I hope the information presented here, tonight, has helped to correct that. However, the White Pine County Board of County Commissioners feels that detailed information regarding the tax revenues of the Project and their distribution should be a part of the FEIS. The Board has asked me to convey a formal request that that be done.

H7-1

Before closing, let me mention employment. At the peak of construction, over 2300 construction workers will be employed. Just under a thousand will be weekly commuters living at the plant site during the week and traveling home on the weekend. The travel limit for such folks is considered to be 300 miles. I would expect a good number to come from the Las Vegas area, perhaps a third or more. They will spend almost all of their money at home coming to White Pine only to earn it.

If 300 people from this area were employed on the Project during the peak year of construction, they would bring at least 6 million and, perhaps, more than 10 million dollars home to Clark County to spend during that year alone.

The benefits of this Project extend far beyond the confines of White Pine County. I and the White Pine County Commissioners believe that should be an important consideration in evaluating this Project.

Thank you for the opportunity to present these remarks.

Response to Comment H7-1: Information on the economic benefits of WPPP to the State of Nevada is included in Section 4.1.7.10 which has been added to the Final EIS.

5.4.2 Federal Agencies

The following federal agencies provided written comments on the Draft EIS:

F1 Bureau of Mines
F2 Humboldt National Forest
F3 Bureau of Reclamation
F4 Fish and Wildlife Service
F5 Advisory Council on Historic Preservation
F6 National Park Service - Air Quality Division
F7 National Park Service - Western Region
F8 Environmental Protection Agency - Region IX
F9 Interstate Commerce Commission

United States Department of the Interior

BUREAU OF MINES

WESTERN FIELD OPERATIONS CENTER
EAST 360 3RD AVENUE
SPOKANE, WASHINGTON 99202

F1

December 12, 1983

Memorandum

To: State Director, Nevada (NV-933.2), Bureau of Land Management, Reno, Nevada

From: Supervisor, Minerals Involvement Section

Subject: Draft Environmental Impact Statement on the White Pine Power Project White Pine, Lincoln, Elko, and Clark Counties, Nevada

A review of the Draft Environmental Impact Statement reveals mineral resources are mentioned as part of "Chapter 3 - Affected Environment." Within this chapter, the mineral natural resources are indicated to be a very important part of the "Affected Environment" because it states, "The county has produced more mineral wealth than any other county in Nevada." However, Chapter 4 which assesses the effects on other natural resources nowhere assesses the effects on mineral natural resources. To be consistent, effects on the minerals of the "Affected Environment" must be assessed. F1-1

D'Arcy P. Banister

Response to Comment F1-1: Only those natural resources which would be impacted by construction and operation at the three WPPP sites are discussed in Chapter 4 of the EIS. Mineral resources are not known to occur at the three sites and, therefore, will not be affected by WPPP construction and operation.

United States Department of Agriculture
Forest Service
HUMBOLDT NATIONAL FOREST
976 Mountain City Hwy.
Elko, Nevada 89801

F2

Reply to 2720

Date December 15, 1983

State Director, Nevada (NV-933.2)
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street; P.O. Box 1200
Reno, Nevada 89520

Dear Mr. Spang:

F2-1 We have reviewed the Draft Environmental Impact Statement (DEIS) for the White Pine Power Project. It appears a major impact of the project on the Humboldt National Forest will be the increased recreational use of the Forest by the workers and their families. However, there is little mention of this in the DEIS. We recommend the recreation writeup be expanded to cover these impacts.

With the addition of 2,345 workers and their families during the construction period in a county with a current population of about 8,000 people, there will be a significant increase in the use of available recreation resources. Although the Forest will probably have sufficient developed recreation capacity in the form of campgrounds and picinc areas, most were built a number of years ago and are in need of rehabilitation to be able to handle the anticipated use.

The bulk of the use will probably be in our dispersed areas. Additional trail improvement and maintenance will be needed. Impacts from ORV's, fuelwood cutting, dispersed camping, etc., could result in resource damage, littering, and user conflicts. There will be a need for additional administration, maintenance, and cleanup.

F2-2 A couple of other minor comments. Item 3.1.7.8 Recreation states, "The county possess a number of natural resources (including wilderness areas)." There are no designated wilderness areas in the county at this time. F2-3 Item 3.1.7.9.1 Public Land states, "Two additional planning areas have been identified which are eligible for consideration as federally designated wilderness areas." There are three Further Planning Areas instead of two, however, all roadless areas are now being reevaluated for wilderness as a result of the decision in the California vs. Black case.

We appreciate the opportunity to comment on this document.

Sincerely,

B.J. GRAVES
Forest Supervisor

FS-6200-11b (7/81)

Response to Comment F2-1: Section 4.1.7.8.1 has been revised in the Final EIS to include information on the impacts on recreation in the Humbolt National Forest.

Response to Comment F2-2: Section 3.1.7.8 has been revised in the Final EIS.

Response to Comment F2-3: Section 3.1.7.9.1 has been revised in the Final EIS.

United States Department of the Interior

(F3)

BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN REPLY REFER TO: LC-154A
120.

DEC 2 9 1983

Memorandum

To: State Director, Nevada (NV-933.2), Bureau of Land Management, P.O. Box 12000, Reno, Nevada 89520

From: ACTING Regional Director

Subject: Draft Environmental Impact Statement on the White Pine Power Project (your office memorandum received October 24, 1983)

We have reviewed the subject document and offer the following comments.

F3-1 Summary, page viii, Air Resources: Air quality benefits due to the project are claimed from reduction of SO_2 emissions from the McGill smelter. Elsewhere it is indicated that the McGill smelter is currently closed but its future is not discussed. It appears that air quality benefits from SO_2 reductions at McGill may accrue with or without the project.

F3-2 Summary, page x, Socioeconomics: There will also be an impact on existing electrical distribution facilities in the area due to increased population during construction and operation of the White Pine Power Project (WPPP). The disparate locations of housing, services, recreation and the projects' locations will require transportation strategies. The plan should be more specific on the various solutions to this problem.

F3-3 Page 2-12, Stations, paragraph 2: It should be noted that the Salt River Project (SRP) is also an owner of the Southern Transmission System at McCullough Switching Station.

F3-4 Figure 3-2, Table 3-1: An additional map is needed locating the major earthquakes that are listed in Table 3-1. Intensities, location, and dates should be on the maps.

F3-5 Page 3-17, 3-18 and Table 3-2, 3-3: Are these all inclusive species lists? If not, they should not be presented as such.

F3-6 Page viii and Table 2 of Summary and pages 4-39 to 4-42: It is not clear what mitigation measures would be implemented, whether Table 2 includes mitigation, or what the net impacts of the project would be.

Roy D. Gear

Response to Comment F3-1: The viability of the McGill smelter is dependent on the price of copper. Because the world market for copper is currently depressed, Kennecott has temporarily shut down the smelter in McGill. Section 4.1.2 has been revised in the Final EIS to provide additional information on impacts to air resources.

Response to Comment F3-2: The Impact Alleviation Plan specifically covers impacts on electric utility and transportation services.

Response to Comment F3-3: The Salt River Project will not be an owner of the WPPP Southern Transmission System. In addition, the Salt River Project does not currently own or jointly own any transmission lines associated with the McCullough Switching Station. (It should be noted that Section 2.1.2.3 has been revised in the Final EIS to include joint ownership of the McCullough Switching Station by the U.S. Bureau of Reclamation and others.)

Response to Comment F3-4: None of the earthquakes listed in Table 3-1 are associated with faults shown on Figure 3.2. Future earthquakes on these faults would be of significance to WPPP.

Response to Comment F3-5: Table 3-2 and Table 3-3 have been revised in the Final EIS to indicate they represent partial lists of species.

Response to Comment F3-6: Table 2 of the Summary includes impacts that would still remain after implementation of all feasible mitigative measures.

United States Department of the Interior

(F4)

FISH AND WILDLIFE SERVICE
GREAT BASIN COMPLEX OFFICE
4600 Kietzke Lane - Bldg. C
Reno, Nevada 89502-5093

January 3, 1984

State Director, Nevada
Bureau of Land Management
Room 3008, Federal Building
300 Booth St., P.O. Box 12000
Reno, NV 89520

Dear Sir:

We have reviewed the Draft Environmental Impact Statement for the White Pine Power Project and have the following comments:

We generally support the Preferred Alternative for Plant siting, railroad corridors, and transmission line corridors. One major exception to this is our preference for the BLM-recommended transmission line corridor east of the Machacek substation because it follows an existing corridor. As far as the two non-preferred Plant site alternatives, we feel that, because of the diversity of aquatic/terrestrial habitats and the presence of endangered/threatened species, etc. in Spring Valley, this site is unacceptable and should no longer be considered as a viable alternative.

F4-1 The Big Spring Spinedace is now officially proposed for listing as a threatened species, (50 CFR, Vol. 48, Nov. 30, 1983), with 4 miles of Meadow Valley Wash in Condor Canyon designated as Critical Habitat. Appropriate sections of the EIS and Biological Assessment should be updated to reflect this change since proposed species are to be considered as being listed for planning and consultation purposes.

F4-2 The Threatened and Endangered Species Maps (e.g., Figs. 3-17 and 3-18 in the EIS) would be much more useful if each locality was accompanied by identification of species referred to. We are unable to determine such information for several indicated localities where an identified occurrence does not correlate with our knowledge of the presence of any candidate or listed species. The indicated map locality for an aquatic species approximately 25 mi. SSW of Wells, NV (if this locality refers to the Clover Valley Speckled Dace, as we presume) is in error; recent field work indicates the fish no longer occurs at that site, but is present at a point several miles north. Also, the locality for an aquatic species 5 mi. west of the Hwy 25-Hwy 93 junction near Panaca appears to be in error, as we previously pointed out in our letter to Dames and Moore on 15 July, 1983. Also, Table 3-4 and 3-5 in the EIS

F4-3 should be checked for correct spelling of scientific names--we notice several inconsistencies.

<u>Response to Comment F4-1</u>: Section 3.1.4.4, Section 3.1.4.6, and Section 4.1.4.5.1 have been revised in the Final EIS to include information on the Big Springs spinedace.

<u>Response to Comment F4-2</u>: Figure 3-17 and Figure 3-18 have been revised in the Final EIS to provide additional information on threatened and endangered species.

<u>Response to Comment F4-3</u>: Table 3-4 and Table 3-5 have been revised in the Final EIS.

Section 3.1.3.2 Hydrology

F4-4 Insufficient information is provided to predict whether or not wetlands throughout North Steptoe and Spring Valleys would be impacted by water withdrawals for any of the three power generation systems.

Response to Comment F4-4: Section 3.1.4.5 has been added and Section 4.1.4.1 has been revised in the Final EIS to provide additional information on wetlands.

Section 4.1.4 Ecological Resources

This section acknowledges that wetlands and aquatic habitats may be impacted. We support this contention since significant water withdrawals are proposed and specific studies to the contrary are absent.

Section 4.1.4.6 Mitigation

F4-5 It is recommended that the potential wetland mitigation be addressed in this section. The water supply reservoir identified in section 2.1.3.3, and cooling water disposal areas could provide wildlife mitigation for these undefined wetland losses or other project related wildlife impacts.

The storage reservoir could be improved for migratory birds by increasing the shoreline to the maximum extent possible through construction of irregular levees or excavated banks, by creating a large surface to volume ratio, by creating shallow, ≤ 3 feet in depth, areas which could support emergent vegetation and by the creation of islands. These same physical characteristics could be applied to the cooling water disposal areas to improve their ability to support migratory birds. In addition, it is recommended that a series of ponds be created to allow the greatest concentration of salts to accumulate in the last pond. It is our understanding that total dissolved solids would be concentrated approximately 12 times during generating plant operation. Thus, the water in the first several ponds should support wildlife including migratory birds.

We recommend that these possibilities for mitigation be developed to the extent possible. Should major changes in wetland habitats become obvious with the project in operation, we would expect additional mitigation. Since information is not being provided to quantify the potential impact, we believe that a written commitment to mitigate any remaining wetland wildlife habitat losses should be provided. We recommend the FWS Habitat Evaluation Procedure be used in this event and we believe the project sponsors should fund such a study and subsequent mitigation measures if necessary to assure no net loss of wildlife habitat.

The mitigation measures and the commitment outlined above would provide compliance with the Fish and Wildlife Coordination Act and Executive Order 11990, Protection of Wetlands.

Response to Comment F4-5: The degreee of impacts to wetlands is not known at this time. Information from the monitoring program discussed in Section 4.1.3.3 will be used to identify impacts before they become significant in order to apply the appropriate mitigative measure. WPPP would provide appropriate mitigation to prevent any significant loss to wildlife habitat. It should be noted that WPPP design requirements would preclude the use of the water supply reservoir for migratory birds. In addition, the preliminary design for WPPP indicates that there would be no discharge of concentrated water (blowdown) to evaporation ponds. However, space is allowed for future ponds should consumption of blowdown in other plant processes not be feasible.

We appreciate the opportunity to provide comments on the subject EIS. If your agency desires any additional information or clarification regarding those comments, please contact Dr. Bob Hallock or Dr. Randy McNatt in our office, FTS 8-470-5227.

Sincerely,

Donald J. King
Complex Manager

cc: Nevada Dept. of Wildlife, Reno, Elko, Las Vegas
USFWS, Boise, ID

Advisory Council On Historic Preservation

F5

1522 K Street, NW
Washington, DC 20005

Reply to:
730 Simms Street, Room 450
Golden, Colorado 80401

December 28, 1983

Mr. Edward F. Spang
State Director
Nevada State Office
Bureau of Land Management
300 Booth St.
Reno, NV 89520

Dear Mr. Spang:

The Council received the Draft Environmental Impact Statement (DEIS) for the White Pine Power Project, White Pine County, Nevada and proposal for a Memorandum of Agreement (MOA) on December 19, 1983. With this letter we will provide our comments on the DEIS, our response to the proposed MOA is in preparation and will be forwarded under a seperate cover.

The approach outlined in the DEIS for dealing with historic and cultural properties is well thought out and, in principle, acceptable to the Council. The actual discussion of the cultural resources needs to be expanded and/or clarified. Areas of Specific concern are discussed below.

1. For all three alternate powerplant sites the DEIS discusses known cultural resources and evaluates the potential presence of other, as yet, unrecorded sites.

F5-1 a. The DEIS should specify whether these statements are based on a literature search or an on-the-ground investigation. If the later, the type (i.e., BLM Class I, II, or III), degree of completeness and level of intensity should be specified.

F5-2 b. The potential for buried sites, especially in the North Steptoe Valley location dunal area, should be considered.

Response to Comment F5-1: Section 3.2.5 has been revised in the Final EIS to provide additional information on the methodology used for cultural resources.

Response to Comment F5-2: Detailed information on buried sites is included in Section 4.2.1 of the Cultural Resources Baseline technical report. Dunes are prevalent only on the North Steptoe Valley Site. They have had an influence on the location, character, and potential significance of cultural resources. This sensitivity is reflected in the rating score for the North Steptoe Valley Site.

F5-3 c. Known National Register eligible or listed sites in the impact areas should be discussed. If there are none (although we note that the DEIS refers to the NNRY Railroad Right-of-way as being eligible), the DEIS should state this explicitly.

F5-4 d. Figures 4-9, 4-10, 4-11, and 4-12 should not be relied upon exclusively in lieu of discussion of resources in sections dealing with the transmission lines, water supply systems, and coal transportation system. These sections should discuss known resources, potential impacts, etc.

2. In general the "generic mitigative" measures seem appropriate.

F5-5 a. Throughout, the emphasis on mitigation as opposed to preservation is very heavy. Consideration of in situ preservation of significant resources must be considered.

F5-6 b. It should be noted that some of the sites referred to as "Native American" may be eligible for listing in the National Register and must, therefore, be dealt with in the MOA.

F5-7 3. Normally, a MOA involves the federal agency, the Council, and the SHPO. This point should be clarified in section 4.1.5.5.1.

We hope that these comments will be of use to the BLM in revising the DEIS. If you have any questions or if the Council can be of further assistance, please contact Alan Downer at (303) 234-4946, and FTS number.

Sincerely,

Louis S. Wall
Chief, Western Division
of Project Review

<u>Response to Comment F5-3</u>: The Cultural Resources Baseline technical report documents that no sites currently listed on, or determined eligible to, the National Register of Historic Places are located within the boundary of any site or corridor. Portions of Nevada Northern Railway are listed on the National Register (the depot in East Ely) or have been nominated to the National Register (rolling stock) by the Nevada Division of Historic Preservation and Archaeology. Section 3.1.5.2 has been revised in the Final EIS to provide additional information on National Register sites in the areas.

<u>Response to Comment F5-4</u>: Figure 4-9 through Figure 4-12 in the Draft EIS were based on detailed information included in the Cultural Resources Baseline. Section 4.1.5.2, Section 4.1.5.3, and Section 4.1.5.4 have been revised in the Final EIS to provide additional information on impacts to cultural resources.

<u>Response to Comment F5-5</u>: Section 4.1.5.5 has been revised in the Final EIS to include information on site preservation of significant resources.

<u>Response to Comment F5-6</u>: Section 4.1.5.5.1 has been revised in the Final EIS to include additional Native American information.

<u>Response to Comment F5-7</u>: Section 4.1.5.5.1 has been revised in the Final EIS to clarify the Memorandum of Agreement.

(F6)

United States Department of the Interior

NATIONAL PARK SERVICE
AIR QUALITY DIVISION
P. O. BOX 25287
DENVER, CO 80225

IN REPLY REFER TO

January 4, 1984

N3615(475)

Memoraodum

To: State Director, Bureau of Land Management, Nevada

From: Chief, Policy, Planning aod Implemeotation Branch, Air and Water Quality Divisioo - Denver

Subject: Review of Draft Environmental Impact Statement, White Pioe Power Project (DES-83/71)

The Air and Water Quality Division has reviewed the Draft Environmental Impact Statement (DEIS) for the White Pine Power Project (WPPP) and offers the following comments:

1. Page 4-5, paragraph (d)

F6-1 The White Pine Couoty Air Proposal states that "reasoned judgment" would be used to determine any significant air quality impacts on the redesignated Steptoe Valley nonattainment area. Normally, air quality impact modeling would be used in those determinations. Considering the complex nature of air pollutant dispersion, it is unclear what "reasoned judgment" cao be used to demonstrate that the project's generating station would have oo significaot impact on the nonattainmeot area. The final EIS should discuss in detail "reasoned judgmeot" and aoy air quality impact determinations made under such judgment.

Response to Comment F6-1: Information on nonattainment area modeling is included in Section 5.4.3 in the response to Comment S9-4.

2. Page 4-5, paragraph (e)

F6-2 The Proposal also states that Kennecott would implement a multi-point rollback plao at the McGill smelter to defioe allowable emissions to bring the nonattainment area into compliaoce. In order for the nonattainment area to be brought into compliance, there must be ao actual decrease in present emissions. Redefiniog allowable emissions, without a corresponding decrease in actual emissioos, will not bring the area into compliaoce (unless the nooattainment designatioo was based on the modeling of allowable emissions).

Response to Comment F6-2: Redesignating an existing nonattainment status requires air quality monitoring data that show eight consecutive quarters with no violations of the National Ambient Air Quality Standards (NAAQS). It is anticipated that sulfur dioxide emissions in White Pine County will result in ambient air quality that is in compliance with the NAAQS.

3. Page 4-8

An option agreement between the WPPP and Kennecott is discussed. The "irrevocable optioo" would require Kennecott to reduce SO_2 emissions by approximately 60 percent at the McGill smelter, thereby providing ao air quality incremeot sufficient to allow the WPPP to receive its permit. In

F6-3 order to expand the available increment, an actual decrease in emissions must occur. Therefore, actual decreases in SO_2 emissions at the McGill smelter must occur before the WPPP begins operation.

4. Page 4-10, second paragraph

F6-4 It is stated that modeling results have demonstrated that the WPPP would comply with both the National Ambient Air Quality Standards (NAAQS) and the Prevention of Significant Deterioration (PSD) increments. However, no modeling analyses were included in the DEIS. Those analyses should be included in the final EIS.

5. Page 4-12, third paragraph

F6-5 It is stated that SO_2 emission limits "slightly higher" than New Source Performance Standards will be required in order to prevent ground level emission concentrations at the McGill smelter from exceeding the PSD increment. We suggest that "more stringent" be substituted for "slightly higher" in order to avoid ambiguity in interpreting the intent of the statement.

6. Page 4-14, first paragraph

F6-6 No visibility analysis was conducted because no class I area was within 100 kilometers of the three alternate WPPP sites, and Environmental Protection Agency (EPA) Region IX did not require a "quantitative assessment of visibility impacts in class I areas beyond 100 kilometers." EPA regulations (40 CFR 52.21 (o)) require visibility, soils and vegetation impairment analyses for all PSD permit applications. The regulations exempt the vegetation analysis only if the vegetation has no significant commercial or recreational values. Such analyses should be conducted and included in the final EIS.

These comments are in addition to those submitted by the Western Regional Office of the National Park Service.

Christine Shaver

Christine Shaver

cc:
WASO: 762 (Morlock/Daugherty)
WRO: Reg. Dir.
LECA: Supt.

Response to Comment F6-3: Any WPPP air quality permit that requires exercise of the Option Agreement with Kennecott would be conditional on the McGill smelter being in compliance prior to WPPP operation.

Response to Comment F6-4: Detailed modeling information has been submitted to the Environmental Protection Agency Region IX. This public information is available for review in the WPPP permit application (NSR 4-7-3, NV 83-01).

Response to Comment F6-5: Section 4.1.2 has been revised in the Final EIS to clarify emission limitations.

Response to Comment F6-6: Section 4.1.2 has been revised in the Final EIS to include additional information on air resources.

(F7)

United States Department of the Interior

NATIONAL PARK SERVICE
WESTERN REGION
450 GOLDEN GATE AVENUE, BOX 36063
SAN FRANCISCO, CALIFORNIA 94102

IN REPLY REFER TO:
L7617 (WR-RPE)

December 23, 1983

Mr. Edward F. Spang, State Director
Bureau of Land Management
300 Booth Street
P.O. Box 12000
Reno, Nevada 89520

Dear Mr. Spang:

The National Park Service has reviewed the Draft Environmental Impact Statement for the proposed White Pine Power Project (WPPP).

The National Park Service supports the preferred alternative locating the WPPP Generating Station at the North Steptoe Valley Site.

Thank you for giving us an opportunity to comment on this document.

Sincerely,

for Howard Chapman
Regional Director, Western Region

cc:
WASO (762)

(F8)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

11 JAN 1984

State Director
Bureau of Land Management
P.O. Box 12000
300 Booth Street
Reno, NV 89520

ATTN: Mr. Ed Tilsey

Dear Mr. Tilsey:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) titled WHITE PINE POWER PROJECT. We have the enclosed comments regarding this DEIS.

We have potential environmental reservations regarding this project and request that additional information be included in the Final Environmental Impact Statement (FEIS) to address environmental impacts. We appreciated the opportunity to meet with you previously to discuss these issues. As a result of our meeting, we understand that some of this information may already exist in other project documents (i.e., permit applications or technical reports) and could be summarized from these sources for public disclosure purposes. Upon review of this additional information, we will advise you whether or not our environmental concerns have been addressed.

Please send five copies of the FEIS to this office at the same time it is officially filed with our Washington, D.C. office. If you have any questions or wish to set up an additional meeting with us, please contact Loretta Kahn Barsamian, Chief, EIS Review Section, at (415) 974-8188 or FTS 454-8188.

Sincerely yours,

Charles W. Murray, Jr.
Assistant Regional Administrator
for Policy, Technical, and
Resources Management

Enclosure (1)

WATER QUALITY COMMENTS

F8-1 1. Description of the Project. The FEIS should describe the size, design, leachate control measures, leachate disposal measures and chemical constituents of the following: the coal storage pile, lime storage, bottom ash basin, solid waste landfill and sanitary landfill. The zero discharge system mentioned on p. 4-14 for liquid effluent should be explained. Descriptions of the effluent treatment system, including compounds, substances and quantity of all effluent streams should be provided. Boiler water, cooling tower blowdown and water treatment system effluent should be described. These detailed descriptions should be used to support findings regarding potential ground water degradation from plant site runoff and leachate. Also, it should be clarified on Figure 2-5 that the process flow shown is for each of the two 750 MW units.

F8-2 2. Assessment of Water Use. Our calculations indicate that the larger cooling tower makeup figure (8193 GPM) may be too low, based upon typical cooling tower performance. We would appreciate an explanation of how the tower makeup water was estimated. If this information is available in the water rights permit, the data could be summarized from that source. This figure is of concern because of its importance in accurately evaluating water demand impacts on ground water basins.

F8-3 3. Water Resources Setting. The FEIS should elaborate on the existing hydrological characteristics of the valley aquifers including the following:

- A detailed and fully balanced description of the existing water budget for each valley, including the volume of ground water extraction possible without overdraft.
- The relationship of each valley to the eastern Nevada carbonate aquifer, including an estimate of the amount of recharge to the carbonate aquifer from each valley.
- Mapping to locate potentially affected springs, ponds, lakes, streams, and creeks.
- Existing water quality data for each valley that is typical of ground water in valley fill.
- Ground water hydraulic gradients (horizontal and vertical), velocities, dispersive tendencies and hydraulic conductivity distributions for use in subsequent modeling.

We recognize that acquisition of some of the requested information may not be feasible, since it may require dense

Response to Comment F8-1: The coal reserve storage pile, bottom ash basins, solid waste landfill, and sanitary landfill will be designed using good engineering practice and will be in conformance with the requirements of state regulatory agencies. Where applicable, the design of facilities will be submitted to the state regulatory agencies for approval.

Detailed design of WPPP facilities will not begin until WPPP receives all major permits and the participants have executed Power Sales Contracts. Section 2.1.1.1, Section 2.1.1.2, and Section 4.1.3.4 have been revised in the Final EIS to include general design information based on WPPP feasibility studies, including the design for "zero liquid discharge".

Figure 2-5 has been revised in the Final EIS to clarify the flow diagram.

Response to Comment F8-2: Cooling water makeup is the sum of drift, evaporation, and cooling tower blowdown. The drift rate indicated in Figure 2-5 is typical of large wet cooling towers. The evaporation rate, which is also typical of cooling towers associated with a power plant the size of WPPP, was calculated by a computer program using weather and other site specific data. The blowdown rate was adjusted to match the demand of the dry scrubbers. This resulted in no net wastewater discharge.

It should be noted that the makeup water rate shown in Figure 2-5 cannot be used to evaluate water demand impacts on the groundwater basin because it is based on 100 percent load operation during the summer months. The value represents a short term, high water demand and should not be extrapolated. The water budget based on normal weather conditions and typical plant operation is shown on Figure 2-12.

Response to Comment F8-3: Information on the regional and site setting associated with resources is included in Section 3.1.3 and Section 3.2.3. Additional information on the existing water budget is included in the Water Resources Baseline technical report, a support document for the Draft EIS.

The relationship of each valley to the Eastern Nevada carbonate aquifer is not entirely known. Some publications suggest hydraulic communications between valley aquifers although much more additional studies will be necessary before relationships can be quantified. As a condition of its water permits, WPPP is currently providing funding to the Eastern Nevada Hydrology Study being conducted by the U.S. Geological Survey and the State of Nevada. This five-year study should provide the data and information necessary for the understanding of the complex arrangement of aquifers.

All known springs, lakes, and creeks were mapped during Phase I of groundwater investigations and are included in the technical report of these investigations. Flow rates and water levels are currently being monitored in Steptoe Valley to provide additional baseline information.

-continued on next page-

sampling and measurement grids for a complete compilation of baseline hydrological data. For uncertainties that cannot be resolved with available data, the FEIS should discuss the uncertainty, how it could affect impact findings and whether potential unavoidable adverse impacts could occur under worst case assumptions.

4. Ground Water Withdrawal Impacts. Due to the assumptions used in modeling, the assessment of ground water withdrawal impacts may not be worst case. Three withdrawal scenarios were discussed, with Case III being identified as worst case. The assessment of project impacts on beneficial uses of water resources, however, is based on Case II. Also, Steptoe Valley and Spring Valley were modeled as confined aquifer systems with uniform aquifer thickness. However, neither of these aquifers is confined, since they recharge the regional carbonate aquifer. The DEIS also states that, "The specification of a fixed boundary condition on the perimeter of the calculation domain will result in an underestimation of actual draw downs near the outer edges of the valley floor" (DEIS p. 4-17).

F8-4 It is possible that ground water withdrawals could significantly impact beneficial uses (water supply and habitat). The FEIS should assess the extent of water table lowering based on worst case assumptions. Case III and a non-fixed boundary condition should be used (using data requested in Comment 3). Based on the results of the worst case modeling, the FEIS should evaluate project impacts on beneficial uses of water resources, including impacts on Shoshone Ponds, wetland habitat, subsidence and existing wells (see Comment 6). In addition, draw downs were computed over the estimated 36 year use of WPPP. The FEIS should address what will happen to the facility after 36 years, in terms of water demand and associated impacts. The FEIS should either present mitigation for all of the above impacts or identify them as unavoidable adverse impacts.

5. Water Quality Impacts. (Please note that parts of this discussion are similar to Comment #1 for the purpose of following the DEIS subject format). We are concerned about

F8-5 the project's impacts on ground water quality. The FEIS should present quantified data indicating the substances, concentrations and quantity of all effluent streams and potential leachate sources. A worst case scenario using modeling studies to indicate the dispersal of contaminants in surface and ground water systems, in the event of contaminant discharge from the project site, should be presented. The FEIS should also explain how contaminants will be contained on site and ultimately disposed of. Potential water quality impacts should be related to applicable water quality standards for a determination of significance. If water quality degradation is found to be a potential adverse impact, it should be related to impacts on beneficial uses of ground water.

-continued from preceeding page-

Random samples of water quality have been made at several locations in Steptoe Valley and Spring Valley. It is not known if these samples are representatives of the valley aquifers and, therefore, have not been included in the EIS. A detailed water quality sampling program will be established to provide additional baseline information.

The methodology and parameters used in computer modeling are included in the technical report of the Phase 3 groundwater investigations. Because a monitoring program will be in place for early detection of adverse effects, there should be no unavoidable adverse impacts even under reasonable postulated worst case assumptions.

Response to Comment F8-4: There were several conservative assumptions incorporated into the groundwater modeling which results in the Case II scenario estimating the anticipated maximum groundwater drawdowns. These include assuming an annual use of 25,000 acre-feet per year (afy) in the model although annual use would be more typically 17,000 afy. In addition, conservative aquifer coefficients were incorporated into the model and salvageable water was not considered. The Case III scenario drawdowns were calculated under the hypothetical, improbable, and highly unrealistic assumption of zero recharge which is not a representative of existing conditions. In addition, the Case III scenario provided for 15,000 afy for future agricultural use which is not the preferred use in Steptoe Valley.

For practical purposes, both Steptoe Valley and Spring Valley can be modeled as confined aquifer systems with uniform aquifer thickness. There are no conclusive findings to date that define any hydraulic communication system from these aquifers to the deep carbonate aquifer.

As WPPP nears the end of its operating life, the annual capacity factor (and water demand) will decrease. After WPPP ceases operation, the groundwater hydrology should return to its original condition prior to construction.

Response to Comment F8-5: Information related to this comment is included in the response to Comment F8-1. It is possible to speculate a worst-case scenario that would result in the discharge of contaminants to the groundwater. However, any leakage would be detected by monitoring devices (e.g., monitoring wells) and appropriate actions could be taken to preclude the point discharge of liquid wasted beyond the site boundaries.

F8-8 6. Impacts on Saline Meadows as a Beneficial Use of Water Resources. The FEIS should describe the important ecological value of the saline meadows in terms of wildlife habitat value, the presence of possible rare and endangered species and the role of wetlands meadows in the otherwise arid regional environment. For instance, the saline meadows support breeding areas for two candidate endangered species (long billed curlew and white faced ibis). Also, the saline meadows provide winter prey hunting range for the bald eagle, a listed endangered species.

The FEIS should locate, quantify and describe the acreage of wetlands lost from construction of the plant site, transmission lines, pipelines and railroad routes. The location, acreage and description of salt meadows subject to water table lowering should be identified. Impacts to the ecological values of the wetlands from draw down should be clearly described, including loss of productivity, reduction in habitat value, potential encroachment of sagebrush communities into the wetlands and loss of breeding and/or feeding habitat for listed and candidate endangered species. Some of this information may be summarized from the Ecological Resources Baseline Technical Report.

The following statements should be corrected in the FEIS: 1) that water table lowering and soil salinity reduction could be beneficial to plant productivity (DEIS p. 4-31); when in fact, saline meadows are the most productive community in the region, and 2) that the long billed curlew and white faced ibis are not among candidate endangered species that could be affected by project activities (DEIS pp. 4-38). It should be noted that if water demand estimates of the project are found to be low (see Water Quality Comment 2), impact assessment must be based on the appropriate water figure.

Response to Comment F8-6: Section 3.1.4.5 has been added and Section 4.1.4.1 has been revised in the Final EIS to provide additional information on wetlands.

7. Monitoring and Water Resources Mitigation. EPA is concerned about the adequacy of the monitoring program to assess project impacts and the feasibility of remedial action. The DEIS presents two examples of possible mitigation measures that could be used, which are variable well operation and additional wells (DEIS p. 4-22). Neither of these options would reduce the volume of ground water extracted, only shift the location of the extraction.

F8-7 The FEIS should include details of the existing monitoring program such as monitoring schedules, location of monitoring stations, methodologies and remedial action contingency plans. The FEIS should also include a ground and surface water quality monitoring program and contingency plan in the vicinity around the entire plant site. Measures to ensure implementation and enforceability of remedial actions should be described for the contingency plans.

Response to Comment F8-7: Impacts associated with WPPP pumping would be site specific and, therefore, proposed mitigation is based on shifting the location of extraction. The monitoring program will provide for early detection of any adverse effects of large groundwater withdrawals. In addition to locations currently being monitored by the U.S. Geological Survey and the State of Nevada, WPPP has been monitoring flow rates and water levels in 16 wells and 9 springs in Steptoe Valley. The wells are monitored monthly and the springs are measured every two weeks, weather permitting. A water quality sampling program will also be established.

AIR QUALITY COMMENTS

1. Project Description. The FEIS should describe the specific coal sources intended and the composition of coal or coals to be used. This information is essential to assessing air quality impacts since potential particulate and SO_2 emissions can vary substantially with different coal sources. A range of best and worst case coal composition options should be presented, if there is uncertainty as to sources. In addition, the FEIS should include information on the combustion system, especially features for minimizing NO_x emissions. Information should be provided regarding the effectiveness of the pollution abatement system, including the compounds and substances in each stream and the percentage "capture" of each pollutant by the abatement devices. The sensitivity of emissions to changes in fuel composition should be discussed. An estimate of particulate emissions resulting from the transportation, handling and on site storage of coal, as well as other substances such as lime, should be provided.

   The FEIS project description should clearly describe and explain the intent to minimize air quality impacts by reducing SO_2 emissions at the nearby McGill copper smelter. A table summarizing WPPP emissions, McGill offsets and net pollution is suggested to ensure a complete understanding of the project process and overall emissions.

F8-9

2. Emissions Estimates and Air Quality Impact Analysis Scope. The FEIS should quantify existing air quality levels in the vicinity of the three alternative plant sites. Some of this data may be summarized from the PSD application material; however, a reference to the PSD process without a quantitative summary would not be sufficient. Emissions estimates from all components of the project (including plant and road construction, vehicular activity, coal and lime handling and growth) should be provided. Quantified predictions of changes to ambient concentrations of pollutants should be derived using an EPA approved dispersion model. If coal sources are uncertain, a best/ worst case range of coal composition should be used to estimate air quality impacts. The FEIS should make quantitative comparisons among the alternatives and identify impacts on attainment and nonattainment pollutant levels.

3. Sensitive Receptor and Sensitive Natural Resources Impacts. Predicted ambient air quality impacts should be used to determine whether sensitive receptors (such as residences, recreation areas, etc.) or sensitive natural resources (such as plants and soil) would be adversely affected by the project. The DEIS indicates that sensitive plant species may be affected (DEIS p. 4-24), but does not specify the species or level of significance. (Elsewhere, it is stated that plant species impacts would not occur, DEIS

Response to Comment F8-8: Section 4.1.2 has been revised in the Final EIS to provide additional information on impacts to air resources. The allowed emissions from WPPP will not be known until a permit is issued by the Environmental Protection Agency (EPA) Region IX and the State of Nevada Division of Environmental Protection (DEP). Emission levels being proposed by WPPP would result in air quality impacts that are lower than federal or state standards that have been established to protect the public. Therefore, no significant impacts will occur regardless of the final emission level stipulated in the air permit.

It should be noted that the final coal fields cannot be determined until after coal supply contracts are approved. These contracts will be dependent on Power Sales Contracts being executed by WPPP participants which, in turn, will be dependent on WPPP having received all major regulatory permits. Therefore, a composite coal was used to determine impacts. By letter dated February 17, 1984, EPA Region IX and the DEP indicated that the use of a composite coal would be acceptable to process the air permit application.

Response to Comment F8-9: A detailed evaluation of air quality impacts is a part of the WPPP application for a Prevention of Significant Deterioration permit which is public information. Sufficient information has been summarized in the EIS to indicate that WPPP emission levels will not exceed federal and state standards that have been established to protect the public. Because standards will not be exceeded, there will be no significant impact and additional detail is not provided in the EIS.

p. 4-13, causing inconsistency in reported findings). Neutralizing of alkaline soils is identified as an effect that is not adverse, but no discussion of potential impacts to alkaline soil dependent plant communities (such as the highly productive salt meadows) is provided. Finally, Figure 2-2 illustrates that worker housing would be located on site at the power plant, but no discussion of potential air pollutant concentrations on site are provided.

F8-10 The FEIS should quantify and substantiate findings on potential impacts to sensitive receptors and sensitive natural resources. The significance of the impacts should also be determined and mitigation provided if significant adverse impacts are found. Air pollutant sensitive plant species located in areas where there are ambient air quality impacts should be clearly identified. The potential for adverse impacts to workers living on the power plant site should be discussed.

F8-11 4. Specific Text Corrections. The following specific text corrections should be made in the FEIS:

a. On p. 4-3, the first sentence in the third paragraph should be revised by adding at the end of that sentence: "prevent air quality degradation greater than the PSD increments, and ensure that modern pollution control equipment is installed at new sources located in attainment areas."

b. On p. 4-4, in the second line of the last paragraph, change "1982" to "1981".

c. On p. 4-8, the first (partial) paragraph should be revised to reflect the following: The amount of emission reductions at Kennecott may be significantly less than 60 percent. The actual percent reductions depend on what years are considered and what emissions averaging period is used.

d. On p. 4-10, the last paragraph should be revised so as to summarize briefly the modeling results for each pollutant.

e. On p. 4-12, the third paragraph should be revised to reflect the fact that a PSD "incomplete" letter was sent to WPPP on July 28, 1983, which advised them that additional information is needed for a completed application.

It should be noted that additional comments regarding Best Available Control Technology (BACT), creditable emission reductions and significant impacts on the McGill nonattainment area may be submitted pending EPA decisions on these issues in the near future.

Response to Comment F8-10: Maximum air quality impacts due to emissions from the WPPP Generating Station are listed in Table 4-3 which has been added to the Final EIS. The maximum impacts are less than the PSD increments and the primary and secondary National Ambient Air Quality Standards (NAAQS) which are designed to protect both public health and public welfare. The secondary NAAQS are designed to protect soils and vegetation. Although concentration levels of WPPP emissions are predicted to be below threshold levels that are injurious to most plant species, it is recognized that long-term exposure to low concentrations could reduce photosynthesis rates of sensitive species (e.g., lichens and aspen). A reduction to soil salinity-alkalinity could increase productivity and species diversity.

The primary NAAQS are designed to protect public health. WPPP emission levels at the construction worker housing will not exceed these standards and there will be no impact to workers.

Response to Comment F8-11: Section 4.1.3 has been revised to include suggested text corrections, where appropriate, or to include new information resulting from ongoing air quality licensing activities.

General Comments

F8-12 1. Need for Section 404 Permit. Discharge of fill may be needed in the salt meadows for water pipelines, transmission lines and potentially on the proposed power plant site. EPA is responsible for review of Corps of Engineers wetland fill permits under Section 404(b) of the Clean Water Act. The FEIS should explain whether a Section 404 permit is needed and, if so, describe the extent, location and types of fill proposed. Also, the FEIS should discuss how the project conforms or conflicts with Section 404 criteria for permit approval and E.O. 11990 policies for wetlands protection.

F8-13 2. Status of Endangered Species Act Consultation. The FEIS should summarize the status of Section 7 consultation and report whether the project will jeopardize the continued existence of the affected endangered species. The listed species dependent upon water resources (Pahrump Killifish) and the aquatic and salt meadows dependent candidate endangered species (relict dace, Bonneville (Utah) cutthroat trout, long billed curlew and white faced ibis) are of particular concern to EPA. The FEIS should also describe how candidate species are being addressed in the Section 7 process.

Response to Comment F8-12: The WPPP preferred site, as shown on Figure 4-1, will not have any facilities constructed within the saline meadow area. No fill material will be deposited within the saline meadow due to construction of WPPP. The area is designated as a closed basin and qualifies for a general (i.e., Nationwide) Section 404 permit from the Corps of Engineers as specified in 33 CFR Part 330, Section 330.4, and Section 330.5(a)(12). Construction of the power transmission system may require a general Section 404 permit.

Response to Comment F8-13: Section 4.1.4.5 has been revised in the Final EIS to include additional information on consultation required by the Endangered Species Act.

F9

Interstate Commerce Commission
Washington, D.C. 20423

OFFICE OF TRANSPORTATION ANALYSIS

January 9, 1984

Edward Spang
State Director, Nevada (NV-933.2)
Bureau of Land Management
Room 3008, Federal Building
300 Booth St.; P.O. Box 12000
Reno, NV 89520

Dear Mr. Spang:

I am writing to submit the Interstate Commerce Commission's Section of Energy and Environment comments on the White Pine Power Project DEIS. I apologize for the fact that they are somewhat tardy.

F9-1 I think that Section 2.1.4.1 should indicate the length of construction involved in the alternative rail corridors associated with the North Steptoe Valley site. Although I realize that it is already implied in Section 2.1.4.1, I think it should be stated explicitly in that Section that the exact location of the rail alignment in any particular corridor has not been determined yet.

F9-2 I suggest that, in Section 4.0, a brief rationale be presented for not addressing the air quality and socioeconomic impacts of rail construction and operation.

F9-3 In Section 4.1.4.1 (p. 4-35), please explain why only minor soil impacts are expected if the existing NNRy ROW is used. On pp. 4-35 and 4-36, wildlife impacts are indicated which could occur in certain valleys. Please indicate with which alternative rail corridor the impacts in a particular valley are associated.

F9-4 Section 4.1.4.6 enumerates actions which "could" mitigate various impacts. Please indicate how it will be determined whether these actions will be taken.

Response to Comment F9-1: Section 2.1.4.1 and Section 2.2.5.5 have been revised in the Final EIS to include the lengths of new and upgraded rail facilities associated with the preferred and alternative railroad corridors.

Response to Comment F9-2: As discussed in Section 2.1.5 of the Draft EIS, the construction labor force for the coal transportation system will be a relatively small number of workers spread over the length of the railroad. Therefore, impacts on socioeconomic resources are expected to be insignificant.

The Clean Air Act does not provide for reviewing mobile source emissions as a part of the air permit review. However, estimates were made of emissions from a unit train operating in Steptoe Valley. For a 172 mile round trip by two-unit trains on the new and/or upgraded railroad, there would be 66 pounds per day of sulfur dioxide emissions and 151 pounds per day of particulate emissions along the route.

Response to Comment F9-3: The Nevada Northern Railway right-of-way upgrade would require less material and, therefore, would cause less soil impacts than construction in a new railroad right-of-way without prior disturbance. The preferred route for the Spring Valley Site and an alternative route segment for the North Steptoe Valley Site cross Antelope Valley. An alternative route segment for either the North Steptoe Valley Site or the Butte Valley Site would traverse Clover Valley.

Response to Comment F9-4: Mitigative measures discussed in the EIS can be listed as required stipulations in the grants for rights-of-way for the required construction, operation, and maintenance plans.

F9-5 Page 2-17 indicates that road crossings will be at grade. Please indicate what type of safety devices will be provided. Also, please indicate the number of at-grade crossings for each of the alternative rail corridors to the preferred plant site, the total average daily traffic for these crossings, by rail corridor, and the expected effect of four trains daily (two loaded, two empty) on accidents and vehicle delay at these crossings.

Thank you for the opportunity to comment on the DEIS.

Sincerely,

Carole Dawkins

Carole Dawkins
Environmental Protection Specialist
Section of Energy and Environment

Response to Comment F9-5: The safety devices will include advance warning signs at all road crossings at grade and automatic flashing light signals with gates at federal and state highway crossings. The safety devices will minimize accidents at highway crossings. There will be two highway crossings at grade along the preferred northern route to the North Steptoe Valley Site. There will be four highway crossings at grade along the alternate northern route and three highway crossings along both alternate southern routes to the North Steptoe Valley Site.

A unit train approximately one mile in length traveling at expected operating speeds will clear a crossing in approximately 90 seconds. The anticipated cycle time from gate closing to opening will be approximately two minutes.

5.4.3 State Agencies

The following state agencies provided written comments on the Draft EIS:

S1 State of Utah - Department of Health

S2 State of Nevada - Department of Transportation

S3 State of Nevada - Department of Conservation and Natural Resources - Division of Historic Preservation and Archaeology

S4 State of Nevada - Department of Agriculture

S5 State of Nevada - Department of Education

S6 State of Nevada - Employment Security Department

S7 State of Nevada - Department of Human Resources - Health Division

S8 State of Nevada - Department of Wildlife

S9 State of Nevada - Department of Environmental Protection

S10 State of Nevada - Department of Water Resources - Division of Water Planning

S11 State of Nevada - Department of Conservation and Natural Resources - Division of State Lands

S12 State of Nevada - Department of Conservation and Natural Resources - Division of Historic Preservation and Archaeology

S13 State of Nevada - Division of State Parks

Scott M. Matheson
Governor

STATE OF UTAH
DEPARTMENT OF HEALTH
DIVISION OF ENVIRONMENTAL HEALTH
150 West North Temple, P.O. Box 2500, Salt Lake City, Utah 84110-2500

S1

James O. Mason, M.D., Dr.P.H.
Executive Director
801-533-6111

DIVISIONS
Community Health Services
Environmental Health
Family Health Services
Health Care Financing

OFFICES
Administrative Services
Community Health Nursing
Management Planning
Medical Examiner
State Health Laboratory

Kenneth Lee Alkema, Director
Room 474 801-533-6121

533-6108

December 28, 1983

Mr. Edward Spang, State Director
Bureau of Land Management
Nevada State Office
P.O. Box 12000
Reno, Nevada 89520

Dear Mr. Spang:

The Draft Environmental Impact Statement on the White Pine Power Project has been reviewed for air quality concerns within the State of Utah. Most of the comments deal with the lack of quantifiable estimates of air quality impacts from the W.P.P.P.

Comments

S1-1 1. It is not clear what the net benefit will be if the White Pine County Air Proposal is implemented. This draft E.I.S. did not quantify what the impacts around W.P.P.P. would be before and after implementation of the proposal. In addition to areas near McGill, the maximum Class II impacts due to W.P.P.P. should be quantified. It is important to know what these Class II impacts are, so that future development may not be restricted by large consumption of any available Class II increment.

S1-2 2. There was no analysis of what the impacts from W.P.P.P. would be in Utah. Possible adverse affects from the interaction of W.P.P.P. with the Intermountain Power Project (IPP) were not addressed. The E.I.S. should therefore contain a cumulative impact analysis not only in Nevada, but in Utah as well.

S1-3 3. The fugitive dust impacts associated with the transportation of coal thru Utah needs to be analyzed. Quantitative impact analysis should include impacts of fugitive coal dust on critical areas that are close to TSP N.A.A.Q. Standards or allowable PSD increments available.

Sincerely,

Brent C. Bradford
Executive Secretary
Utah Air Conservation Committee

DP:il

An Equal Opportunity Employer

Response to Comment S1-1: Because of uncertainties in the White Pine County Air Proposal due to significant changes in EPA policy (discussed in revisions to Section 4.1.2.6 in the Final EIS), it is not possible to determine the actual reduction in emissions. Quantified impacts are listed in Table 4-3 which has been added to the Final EIS. The actual emission levels near McGill should not preclude any future development. It should be noted, however, that McGill is currently in a nonattainment area.

Response to Comment S1-2: From an air quality perspective, there will be little interaction between the plumes from the Intermountain Power Project (IPP) and WPPP. The Spring Valley Site is nearest IPP and, therefore, would have the largest potential for cumulative air quality impacts. However, the Spring Valley Site is over 100 miles from IPP. This distance, and the topography between the two sites, effectively eliminates significant cumulative interaction between the two plumes.

Response to Comment S1-3: Fugitive dust impacts associated with coal transportation by rail were calculated by modeling the coal train as a line source using 24-hour average emissions at a fixed location. The worst-case 24-hour average particulate matter concentration due to fugitive dust associated with coal transportation was estimated to be 2.5 micrograms per cubic meter which is one-half of the Environmental Protection Agency significance level. Therefore, impacts from fugitive dust are considered insignificant and would not impact ambient air quality.

STATE OF NEVADA

RICHARD H. BRYAN
Governor

LINDA A. RYAN
Director

STATE OFFICE OF COMMUNITY SERVICES

Capitol Complex
Carson City, Nevada 89710
(702) 885-4420

December 29, 1983

Edward F. Spang, State Director
Bureau of Land Management
P.O. Box 12000
Reno, Nevada 89520

Re: SAI NV #84300038 Project: DEIS, White Pine Power Project, 1792, N-34895

Dear Mr. Spang:

Attached are the comments from the Nevada Departments of Agriculture, Education, Employment Security, Human Resources, and Wildlife; the Nevada Divisions of Environmental Protection and Water Planning. If and when we receive additional comments, we will forward them to you.

These comments constitute the State Clearinghouse review of this proposal. Please address these comments or concerns in the final plan.

Sincerely,

John B Walker

John B. Walker, Coordinator
Clearinghouse Program

JBW/aa

Donna McClay, Dames & Moore
Enclosures

STATE OF NEVADA

RICHARD H. BRYAN
Governor

LINDA A. RYAN
Director

STATE OFFICE OF COMMUNITY SERVICES

Capitol Complex
Carson City, Nevada 89710
(702) 885-4420

December 30, 1983

Edward F. Spang, State Director
Bureau of Land Management
P.O. Box 12000
Reno, Nevada 89520

Re: SAI NV #84300038 Project: DEIS White Pine Power Project, 1792, N-34895

Dear Mr. Spang:

Attached is an additional comment from the Department of Transportation that was received after our previous letter to you. Please address this comment or any concerns in the final plan.

Sincerely,

John B Walker

John B. Walker, Coordinator
Clearinghouse Program

JBW/aa

Enclosure

NEVADA DEPARTMENT OF TRANSPORTATION

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

1263 SOUTH STEWART STREET
CARSON CITY, NEVADA 89712

TRANSPORTATION BOARD
RICHARD H. BRYAN, *Governor, Chairman*
BRIAN McKAY, *Attorney General*
DARREL R. DAINES, *State Controller*

(S2)

December 27, 1983

A. E. STONE
Director

IN REPLY REFER TO

PSD 7.11

Ms. Linda Ryan, Director
Office of Community Services
1100 East Williams, Suite 109
Carson City, Nevada 89701

Dear Ms. Ryan:

The Nevada Department of Transportation (NDOT) has received and reviewed the DEIS as well as the Air Resources, Ecological Resources, Visual Resources and Socio Economic Analysis Reports for the White Pine Power Project. The documents were circulated to the appropriate Division of NDOT including Transportation Planning, Traffic Engineering, Environmental and the District III office in Elko. The following comments regarding intended actions by and impacts from the project are offered for consideration by the project team and eventually the contractor for the project.

S2-1 A major concern of the Roadside Development and Environmental Division suggested that appropriate officials in the NDOT Maintenance Division meet with WPPP water resource personnel to determine direct impacts to NDOT wells in the project area and determine satisfactory mitigation measures.

S2-2 The Traffic Engineering Section of the NDOT Design Division responded to Chapter 2, part 2.2.6.1, with the following statements. First, any direct access to U.S. 50 or U.S. 93 must include left turn storage, acceleration/deceleration lanes able to adaquately accomadate design vehicles and the placement of the security gate a proper distance from the highway to preclude waiting vehicles from blocking the highway. Additionally, the McGill Bypass should be reviewed in all details with the
S2-3 NDOT Design Division to ensure proper access to existing highways and assurance as to its need. In fact unless the trucks moving to and from the site are carrying hazardous cargos or have oversize geometrics the bypass may not be required.

S2-4 With regard to Table 3-12, Traffic Volumes, volumes reflecting the anticipated traffic generation and distribution associated with the peak construction and future resident population would be quite helpful. Those volumes could be used to determine modifications required to assure adequate geometric design at critical intersections and along impacted highway segments. Necessary changes to existing facilities and the design procedures necessary to implement them would be the subject of meetings and communication between the project contractors and NDOT. Where these improvements require capital expenditures for construction or R/W the costs will be born entirely by the WPPP as NDOT funding is committed to other priority projects throughout the State for many years.

O-MA-HI

<u>Response to Comment S2-1</u>: WPPP wells will be located at least one mile from existing wells in order to minimize any impacts due to groundwater withdrawal. Should the groundwater monitoring program identify the potential for impacts to Department of Transportation wells, meetings would be held to discuss satisfactory mitigation measures.

<u>Response to Comment S2-2</u>: The design of intersections with major highways will be coordinated with the Nevada Department of Transportation. Left-turn storage, acceleration/deceleration lanes, and security gates will be considered in the intersection design.

<u>Response to Comment S2-3</u>: The design of the McGill Bypass (if necessary) will be coordinated with the Nevada Department of Transportation to ensure proper highway design and access to existing highways.

<u>Response to Comment S2-4</u>: The primary WPPP impact on existing road networks will result from increased commuting trips to the site by WPPP workers as well as increased road use by new population. This impact is discussed in Section 4.1.7.7.1.

Population increases due to WPPP will also result in a general increase in traffic volumes in approximate proportion to the size of the increase. The precise origins, destinations, and routes of trips associated with these population increases cannot be accurately predicted. However, it is assumed that these trips would usually not occur during the rush hours.

Ms. Linda Ryan, Director
December 27, 1983
Page -2-

Since the borrow material will be acquired from sources west of the preferred site no major impact is expected from construction equipment traveling on the highway, however it will be expected that any damage done to State Interest roads will be repaired by WPPP. The DEIS indicates that 60-75 trucks weekly will use highways to access the site, however, they are assumed to be light delivery or construction vehicles hauling building materials.

S2-5 Other alternatives to transportation of workers to alleviate peak hour traffic problems should include staggered work hours and van pools or buses from Ely. Full buses or vans could be leased, purchased, or contracted and the WPPP could offer certain incentives to encourage the use of these services. These stratagies could serve to eliminate the need for new roadway construction and costly improvements to existing locations that might only occur during the peak construction period.

S2-6 The coal transportation system utilizing the new track constructed within or outside the existing Nevada Northern Railway's rights-of-way, will require at grade crossings, for the preferred site, on U.S. 93 at Currie. The NDOT is responsible for the State Rail/Highway grade crossing program and as such must be involved to determine compliance with design and safety standards associated with any crossing on State interest roads. Furthermore all costs incurred in the crossing must be born by the project as funding is committed to a statewide listing of projects. From a rail transportation standpoint, the North Steptoe Valley would appear to be most feasible due to recent actions involving transportation along the Union Pacific's Pioche and Prince Branchlines from the south. The Union

S2-7 Pacific was granted an abandonment certificate in July of 1983. It is assumed that this condition was not reflected in earlier evaluations and the costs of rehabilitation and line purchase should be included in the considerations of the Butte Valley and Spring Valley sites.

The NDOT appreciates this opportunity to comment on the White Pine Power Project. We are prepared to meet with project personnel or contractors at any time to further discuss the project or answer any questions.

Sincerely,

DENNIS O. BARRY
Assistant Director
Planning

DOB:WHH:bf

cc: J. King, Roadside Development
C. Case, Safety Engineering
R. Phillips, Traffic Design
D. Pray, Elko

Response to Comment S2-5: Prior to committing to the construction of new or upgraded roads, a detailed study of alternatives will be made. This study will include the alternatives of staggered work hours, van pools or buses, and rail transportation.

Response to Comment S2-6: Section 2.1.7 and Table 2-3, which have been added to the Final EIS, includes the authorizing actions of Nevada agencies. The WPPP will submit an application to the Nevada Public Service Commission (PSC) for all grade crossings between railroad and public highways. The PSC will coordinate grade crossing applications with the Nevada Department of Transportation.

Response to Comment S2-7: Because the 3 percent grade between Caliente and Pioche is unsuitable for unit train operation, the costs of the railroad from the south included new rail, ties, and ballast over the entire branch. In addition, the costs included the replacement of all bridges north of Panaca.

RICHARD H. BRYAN
Governor

STATE OF NEVADA

ROLAND D. WESTERGARD
State Historic Preservation Officer

(S3)

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF HISTORIC PRESERVATION AND ARCHEOLOGY
201 S. Fall Street
Capitol Complex
Carson City, Nevada 89710
(702) 885-5138

January 3, 1984

M E M O R A N D U M

TO: John Walker, Office of Community Services

FROM: Alice M. Becker, Staff Archeologist Alice M. Becker

SUBJECT: White Pine Power Project DEIS and Technical Report on Cultural Resources, SAI NV#84300038

The Division has reviewed the above-referenced documents. According to the technical report, sites eligible for, listed on the National Register of Historic Places are located around and in the project site, along the powerline corridor, and in the well-fields and coal transportation system. An intensive archeological/historical survey would likely reveal more significant sites.

S3-1 In regards to specific recommendations, we would prefer to see the Sunshine Locality, a National Register District avoided if the Machacek Corridor is selected. The District contains pre-Archaic sites located in sand dunes. It would be costly to recover data from areas that would be directly impacted and difficult to prevent indirect impacts to the remainder of the district.

The Nevada Northern Railroad is considered the best existing representative of a short line rail operation and it is eligible for inclusion in the Register. At this time, a National Register nomination for the rolling stock and several associated buildings is being prepared which should aid in the assessment of the significance of sites and features discovered along the path of the rail bed.

The North Steptoe Valley Site, the preferred locale, is the most archeologically sensitive of the three WPPP sites and has a high potential for cultural resources.

Taking these facts into consideration, a memorandum of agreement for the treatment of cultural resources for the project is being prepared which will outline steps necessary for compliance with current federal preservation laws (National Historic Preservation Act of 1966, as amended, Executive Order 11593, and Advisory Council Procedures 36CFR, Part 800). A plan will be agreed upon

Response to Comment S3-1: The southern boundary of the township that includes the Sunshine Locality (T20N, R58E) is the northern boundary of the study corridor for the Northern Transmission System preferred corridor. The original corridor alignment took into consideration avoiding the archaeological area in the township.

Mr. John Walker
January 3, 1984
page 2

detailing methods of identification, protection and data recovery to negate potential adverse effects to properties of National Register quality.

The Division will continue to comment on the formulation of the MOA and plan in coordination with the Advisory Council on Historic Preservation and the BLM.

AB/amb

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CARSON CITY, NEVADA 89710
(702) 885-4420

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X Human Resources, Health	__ ______	
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FROM: Linda A. Ryan, Director

SAI NV # 84300038 PROJECT: DEIS, WHITE PINE POWER PROJECT

Attached for review and comment is a copy of the aforementioned project. Please evaluate it with respect to:
1) the program's effect on your plans and programs;
2) the importance of its contribution to State and/or areawide goals and objectives;
3) its accord with any applicable law, order or regulation with which you are familiar and/or
4) additional considerations.

PLEASE SUBMIT YOUR COMMENTS NO LATER THAN [redacted]. Write out your comments if applicable, check the appropriate box below and return the form to this office. PLEASE DO SO EVEN IF YOU HAVE NO COMMENT on this particular project so that we may complete our processing. If you are unable to comment by the prescribed date, please notify this office immediately.

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__ Additional information (see below)
__ Conference desired (see below)
__ Conditional support (outlined below)
__ Disapproval/denial of funding (must specify reason below)

Comments: (use additional sheets if necessary)

Please see attached memorandum.

Alice M Baker Staff Archeologist (702) 885-5138 1/3/84
Signature Title Phone Date

RICHARD H. BRYAN
GOVERNOR

(S4)

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(MAILING ADDRESS—P.O. BOX 11100, RENO, NEVADA 89510-1100)
TELEPHONE (702) 789-0180

MEMORANDUM

Office of Community Services
1100 East Williams, Suite 109
Carson City, Nevada 89710

November 14, 1983

SAI NV # 84300038 - Deis, White Pine Power Project
Comments Oue: 12/27/83

The following are the comments of the Nevada State Oepartment of Agriculture:

Page 4 - 18 pp. 1

S4-1 The statement "Both Case I and Case II are based on the assumption that groundwater withdrawals for agricultural would remain constant (and at their current levels) over the life of the project" may not be correct.

There is a very good possibility that there could be numerous Oesert Land Entries in the area. Since this is highly probable, the Oepartment feels that additional study is needed in the water appropriation area.

Page 4 - 76 (4.1.7.9.2) - Livestock Management

Due to size of the project, this Oepartment feels that there will be much greater impacts of the livestock users of the area than are presented.

With the increase of people in the area, there is a much greater chance of rustling, harassment, vandalism to equipment fences and range improvements. These are not adequately addressed.

Page 2 - 14 (2.1.3.2) - Water Conveyance

Since each pipeline will be buried, it will require that the disturbed area will have to be revegetated to prevent establishment of undesirable species such as halogetan.

Historically in Nevada, revegetation projects have been unsuccessful without supplemental irrigation. Revegetation projects should be explained in more detail in the final EIS.

Richard L. Rowe
Richard L. Rowe
Regional Coordinator

RLR:L

Response to Comment S4-1: As stated in Section 4.1.3.3, the Nevada State Engineer, on August 17, 1983, declared industrial power generation as the preferred use of groundwater in Steptoe Valley, thereby limiting agricultural development. Should WPPP be located at the alternative Spring Valley Site, the Nevada State Engineer would probably hold a public hearing to consider testimony regarding Desert Land Entry as well as Carey Act applications.

Response to Comment S4-2: Increased population may result in an increase in rustling, vandalism, and harassment of livestock. Mitigative measures include the strengthening of security and police forces and the education of WPPP personnel and the public regarding laws and regulations on livestock theft. Information on the Impact Alleviation Plan for agricultural producers is included in Section 5.4.1 in the response to Comment H5-11.

Response to Comment S4-3: All pipelines will buried with a minimum cover of four feet to provide protection from freezing and other hazards. Detailed mitigation with respect to revegetation of disturbed areas was included in Section 4.1.4.6 of the Draft EIS.

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S5

TO:

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X Human Resources, Health	__ ______	
__ Indian Commission		

FROM: Linda A. Ryan, Director

SAI NV # 84300038 PROJECT: DEIS, WHITE PINE POWER PROJECT

Attached for review and comment is a copy of the aforementioned project. Please evaluate it with respect to:
1) the program's effect on your plans and programs;
2) the importance of its contribution to State and/or areawide goals and objectives;
3) its accord with any applicable law, order or regulation with which you are familiar and/or
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__ No comment on this project	__ Conference desired (see below)
✓ Proposal supported as written	__ Conditional support (outlined below)
__ Additional information (see below)	__ Disapproval/denial of funding (must specify reason below)

Comments: (use additional sheets if necessary)

The Impact Alleviation Plan should include an examination of the impact to the White Pine County School District with particular attention to facilities and staffing.

Myrna Macdonald — Reviewer's Signature; Deputy Supt — Title; 885-3104 — Phone; 11/1/83 — Date

Response to Comment S5-1: The Impact Alleviation Plan, which was approved by the White Pine County School District in August 1983, includes provisions to identify and mitigate impacts associated with public education in White Pine County.

RICHARD H. BRYAN
Governor

STATE OF NEVADA

STANLEY P. JONES
Executive Director

S6

EMPLOYMENT SECURITY DEPARTMENT
500 East Third Street
Carson City, Nevada 89713

December 21, 1983

Refer to AS-EE

Linda Ryan, Director
Office of Community Services
1100 East William, Suite 109
Carson City, Nevada 89710

Subject: DEIS, White Pine Power Project

Dear Ms. Ryan:

I have recently had the opportunity to review the socioeconomic analysis portion of the draft environmental impact statement. The following comments should be taken into account:

S6-1 (1) Page 2-4 - The DEISM model described here is not employed by the Employment Security Department. We were responsible for a portion of the raw data used in this model, but it is owned by the Nevada State Planning Coordinator's Office. Therefore, any reference to ESD's projections is mistaken.

S6-2 (2) Page 2-10 and 2-11 - The White Pine County unemployment rate for 1981 is shown as 6.8 percent, and it should be 6.7 percent. The 1982 unemployment rate is shown as 17.2 percent and should be 14.3 percent. The Nevada rate for 1982 is shown as 11.5 percent and should be 10.1 percent. (These are annual average data).

S6-3 (3) Page 2-11 - In the section on employment projections, a reference is made as to the extent of employment coverage in unemployment compensation. This should read 98 percent rather than 90 to 95 percent.

(4) Table 2-5 (second page) - Total employment for the State of Nevada for 1981 is shown as 555,500. This would indicate an over-the-year increase of 23.6 percent - a change not supported by the industrial data below. The subcategories of trade and government are double counted in this number, which should be 414,000 plus the nonfarm proprietors, farm nonproprietors, farm proprietors, and agricultural services, forestry and fisheries.

<u>Response to Comment S6-1</u>: Section 3.1.7.1.3 has been revised in the Final EIS.

<u>Response to Comment S6-2</u>: Section 3.1.7.2.1 and Table 3-9 have been revised in the Final EIS.

<u>Response to Comment S6-3</u>: The comments refer to sections of the Socioeconomic Baseline technical report which were not summarized in the Draft EIS.

Letter to Ms. Ryan
Page 2 of 2
December 21, 1983

S6-3 (5) Table 2-10 - The Nevada Employment Security Department is cited as the source of this data. This is only true in part. The 1985 through 2000 data has not been provided by this department. In addition, the data in this table is not covered employment, but a series called "Nonagricultural Wage and Salary Employment". This series has been combined with the sector "Agriculture, Forestry, and Fisheries" to produce an estimate of total employment by industrial sector.

I hope these comments are of value in your analysis. If you have further questions on my statement, feel free to call me at 885-4550.

Sincerely,

Dan Culbert

Dan Culbert
Labor Economist

jh

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1100 EAST WILLIAM, SUITE 109
CARSON CITY, NEVADA 89710
(702) 885-4420

(87)

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X Human Resources - Health	__	
__ Indian Commission		

FROM: Linda A. Ryan, Director

SAI NV # 84300038 PROJECT: DEIS, White Pine Power Project

TECHNICAL REPORTS

Attached for review and comment is a copy of the aforementioned project. Please evaluate it with respect to:
1) the program's effect on your plans and programs;
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__ Conference desired (see below)
X Conditional support (outlined below)
__ Disapproval/denial of funding (must specify reason below)

Comments: (use additional sheets if necessary)

NOTE: Seven (7) separate Technical Reports have been prepared in support of the White Pine Power Project. The Reports are provided to assist in developing your comments.

1) Air Resources
2) Water Resources
3) Ecological Resources
4) Biological Assessment
5) Cultural Resources
6) Visual Resources
7) Socioeconomical Analysis

Support subject to review and approval of water system by health division prior to start of construction.

J.C. Allister, P.E. — Supv., Public Health Engr — 885-4750 — 12/20/83
Reviewer's Signature — Title — Phone — Date

S8

STATE OF NEVADA
DEPARTMENT OF WILDLIFE
1100 Valley Road
P O Box 10678
Reno, Nevada 89520-0022
(702) 789-0500

RICHARD H. BRYAN
Governor

WILLIAM A. MOLINI
Director

December 20, 1983

Ms. Linda Ryan, Director
Office of Community Services
1100 East William, Suite 109
Carson City, NV 89701

Dear Linda:

We appreciate the opportunity to review and comment on the Draft Environmental Impact Statement for the White Pine Power Project which was proposed by the Nevada State office of the Bureau of Land Management (SAI NV#84300038). Previous comments for this project were submitted by our agency through the State Clearinghouse in March 23, 1982 and April 27, 1982 and were associated with the early stages of the planning process. It appears that many of our concerns were addressed in the recently completed DEIS document.

S8-1 Additional law enforcement needs were identified for White Pine County and City and Highway Patrol, but no additional need was recognized for wildlife law enforcement by the Nevada Department of Wildlife. We believe the need for additional wildlife law enforcement will be as great as for other enforcement agencies.

The following recommendations should also be considered for inclusion under mitigating measures:

S8-2 1. Water could be provided to pronghorn and deer in areas adjacent to well fields and pipelines where current water distribution is inadequate. Piping water some distance from the development may successfully mitigate habitat losses, particularly for antelope.

S8-3 2. The saving of topsoil and replacement before seeding should be applicable to all disturbed areas. Reseeding with desirable browse and forb species for wildlife should be a standard procedure.

Response to Comment S8-1: Increased population associated with WPPP construction and operation could result in the additional need for wildlife law enforcement. Revenue for any additional personnel would be through taxes paid by WPPP to the state. The Nevada Department of Wildlife would have to request funding for personnel from the State of Nevada General Fund.

Response to Comment S8-2: Section 4.1.4.6 has been revised in the Final EIS to include additional mitigative measures.

Response to Comment S8-3: Topsoil salvage would take place wherever there is adequate and suitable material to be salvaged. Inclusion of browse and forb species in seeding mixtures desirable to wildlife in seeding mixtures would be a part of the revegetation effort whenever those species are available.

Ms. Linda Ryan
December 20, 1983
Page 2

S8-4 It should be noted that the mitigation provided for on page 4-42, paragraph C is in conflict with Department Policy Plan objectives which preclude stocked salmonids as a management technique in wild trout populations, including cutthroat trout. Instead, these populations are intended to be managed as self-sustaining and self-perpetuating.

Again, we appreciate the opportunity to provide input. If you have any questions on the above or feel a need for further clarification at this time, please advise.

Sincerley,

WILLIAM A. MOLINI, DIRECTOR

Patrick Coffin

Patrick D. Coffin
Acting Director

RPM:cb

cc: Region II
Region III

Response to Comment S8-4: Section 4.1.4.6 has been revised in the Final EIS to clarify mitigative measures associated with stocking programs.

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TO:

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__ Equal Rights Commission	__	
X Human Resources, Health	__	
__ Indian Commission		

FROM: Linda A. Ryan, Director

SAI NV # 84300038   PROJECT: DEIS, WHITE PINE POWER PROJECT

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1) the program's effect on your plans and programs;
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__ Disapproval/denial of funding (must specify reason below)

Comments: (use additional sheets if necessary)

SEE ATTACHED COMMENTS.

L. H. Dodgion /kgr — Signature
ADMINISTRATOR — Title
885-4670 — Phone
12/6/83 — Date

Air Comments on the Draft EIS for WPPP

(S9)

The EIS as written can only be given conditional support because it lacks necessary information or clarification in the following areas.

S9-1 On page 2-7 the average capacity factor of 68 percent for the first 20 years and 75% over the 35 years or the life of the plant. I would suspect that there would be less of a load factor during the last 15 years. This may also reflect a difference in air emission when calculating annual ambient impacts.

S9-2 On page 2-56 the air quality impact may significantly be modified by the quality of coal from the nine coal deposits. The Tracy elements and sulfur content will differ signficiantly, thereby making a determination of actual impact impossible. A final coal field selection will have to be made to complete the technical review of the PSD Permit.

S9-3 On page 3-11 it stated PSD increments are established by EPA and DEP. This is not the case. The increments are established by federal law in the Clean Air Act.

S9-4 On page 4-5 it states that reasoned judgment would be used to determine significant impacts but models must be used to perform impact analysis to determine significant impacts so reasoned judgment has something to base the conclusions.

S9-5 On page 4-7 it states that no emission control systm has ever been operated at the McGill smelter. There has been TSP control programs but no SO_2 emission controls outside of supplementary control system (SCS) which is a monitoring with production modification during elevated ambient concentration or adverse meteorlogical conditions.

S9-6 In the discussions on NO_x in chapter 4, the NO_x emissions from the smelter are not clearly identified nor are the individual effects or combined effects of the plume mixing with WPPP discharge throughly investigated.

S9-7 Under the discussion of emissions and emission controls of the Option Agreement there is no mention of actual or estimated emissions and their effects on ambient concentrations withn the Steptoe Valley or the mountains that form this basin.

S9-8 A more detailed discussion on the effects of the plumes of WPPP and Kennecott, how they will interact and the individual effects they will have.

S9-9 What is the projected rate of coal consumption during half load and full laod, (how many tons of coal will be burned per hour). The chart in the appendix does not answer this, it is not properly labled. Are the values in thousands, millions, etc.

Response to Comment S9-1: Section 2.1.1.2 has been revised in the Final EIS to clarify the WPPP capacity factor. It should be noted that the operating hours referred to in the Draft EIS included hours when the units are at partial load.

Response to Comment S9-2: The final coal fields cannot be determined until after coal supply contracts are approved. These contracts will be dependent on Power Sales Contracts being executed by WPPP participants which, in turn, will be dependent on WPPP having received all major regulatory permits. As stated in Section 2.1.4, a composite coal was established for air quality licensing. This coal represents the typical quality of coal that is expected to be burned. It should be noted that, by letter dated February 17, 1984, both the Environmental Protection Agency Region IX and the State of Nevada Division of Environmental Protection indicated that the use of a composite coal would be acceptable to process the air permit application.

Response to Comment S9-3: Although the Prevention of Significant Deterioration increments have been established in the Clean Air Act, these values have been adopted by both the Environmental Protection Agency and State of Nevada as regulations.

Response to Comment S9-4: Environmental Protection Agency air quality models (MPTER, COMPLEX I, and MESOPUFF) were used to estimate the WPPP impact on the nonattainment area. Initial model calculations were made using air pollutant emission data from both the Kennecott smelter in McGill, Nevada, and WPPP. The results of the air quality modeling indicate that WPPP does not have the potential to significantly impact the nonattainment area.

Response to Comment S9-5: It is recognized that no permanent emission control system has ever been operated at the McGill smelter.

Response to Comment S9-6: A one-year meteorological and air quality data monitoring program was undertaken to estimate background air quality levels and meteorological parameters in White Pine County. As part of this program, background nitrogen dioxide (NO_2) levels were measured at the North Steptoe Valley Site. The maximum NO_2 level measured at this location was assumed to be a representative of worst-case NO_2 concentrations in White Pine County since this monitor was nearest the McGill smelter. Using these data in the air quality impact analysis results in considering the combined effect of the mixing of the plumes from WPPP and the McGill smelter.

Response to Comment S9-7: Because of uncertainties in the White Pine County Air Proposal due to significant changes in EPA policy (discussed in Section 4.1.2.5 in the Final EIS), it is not possible to determine the actual reduction in emissions that would occur. It should be noted that actual emissions will not exceed federal and state standards or any conditions included in the air permit.

Response to Comment S9-8: Air quality impact analysis considered simultaneous plumes from both the WPPP Generating Station and the McGill smelter. Technical details of the interaction of plumes have been submitted to the Environmental Protection Agency Region IX and the State of Nevada Division of Environmental Protection as a part of the application for the WPPP air permit.

S9-10 The brief discussion on deposition of sulfates and nitrates on the highly alkaline soils of the county on page 4-13 does not seem adequate. A more indepth study of the effects of the potential acid rain production by WPPP or the reduction in deposition with the implmentation of the agreement. What effects would it have on the pristine areas surrounding the proposed sites. These areas should include the Schell Creek Range, Snake Range, Grant Range, White Pine Range and the Ruby Mountain (including the Ruby Mountain Scenic Area, and the Ruby Lake National Wildlife Rufuge). The document should describe the differences of absorption or neutrilization of the sulfate and nitrates particles based on the elevation of the receiving waters and their buffering capacities.

GG/nd

-2-

Response to Comment S9-9: There is no appendix in the Draft EIS. Figure 2-16 in the Draft EIS has been revised to show the correct units of annual and cumulative coal requirements. Hourly coal consumption at full load is shown on Figure 2-5. At half load, coal consumption would be approximately 55 percent of the full load rate because of the higher heat rate.

Response to Comment S9-10: Quantifying the acid rain impacts of a single source of air pollutants is a difficult task due to the complex chemical and physical phenomena that are associated with acid rain production. Extensive research is currently underway to develop air quality models that can predict acid rain impacts. It should be noted that, in the past, sulfur dioxide emissions from the McGill smelter have been significantly larger than those calculated for WPPP. To date, there has been no documented evidence of significant impacts to pristine areas from these long-term emissions.

2.2.4.3 - <u>Water Permits</u>

S9-11 A groundwater discharge permit with the Water Section of the Division of Environmental Protection will probably be needed for the disposal areas. Also, a discharge permit will be required for the temporary sewage treatment facilities.

3.1.7.6.2 - <u>Utility Systems</u>

S9-12 Sewer systems in Ruth and McGill are deteriorated and are in need of replacement. Many hours of maintenance are needed for both collection systems. Treatment facilities for both towns were found to be unacceptable on July 25, 1983.

4.3.4 - <u>Water Quality</u>

S9-13 Will there be a pronounced effect on the upward component of the groundwater flow in the center of the valley when the plant is in operation with Wells causing a substantial drawdown in the groundwater level?

Table 4-7

S9-14 Will the population of Ruth and McGill rise even more than indicated? If the North Steptoe Valley alternative is chosen, McGill would be the closest larger town with available housing.

<u>Response to Comment S9-11</u>: Groundwater discharge permits, required under NRS 445.131 through NRS 445.354, Nevada Water Pollution Control Law, for WPPP disposal areas will be obtained from the Water Section of the Nevada Division of Environmental Protection.

There will be no temporary sewage treatment facilities on the WPPP site. The WPPP sewage treatment facilities will be utilized during the construction period and operation period. A National Pollutant Discharge Elimination System discharge permit will not be required because WPPP is being designed as a zero discharge facility (i.e., having no point discharge of pollutants to surface waters of the state). The treated sewage effluent will be evaporated in evaporation ponds during construction and reused to transport bottom ash during the operation period. Excess treated sewage effluent will be discharged in the evaporation ponds. A groundwater discharge permit may be required for the evaporation ponds.

<u>Response to Comment S9-12</u>: The sewer systems in Ruth and McGill are discussed in Section 4.1.7.7.2. Impacts to these sewer systems which are attributable to WPPP would be mitigated by the Impact Alleviation Plan described in Section 4.1.7.12.5.

<u>Response to Comment S9-13</u>: The groundwater level drawdowns resulting from WPPP pumping will be greatest in the immediate vicinity of the wells and will decrease rapidly with distance from the wells as shown on Figure 4-1 through Figure 4-3. The well fields were selected to prevent severe drawdowns in a concentrated area of a valley.

<u>Response to Comment S9-14</u>: The initial allocation of work force by place of residence was made using a gravity model. The model assigns relative importance to the distance factor (willingness to commute) and equates all other factors (quality of life indicators) to the size of the community under evaluation. The communities identified by the gravity model were assigned attractiveness ratios relative to housing and services available in Ely. The gravity model was then modified to reflect community attraction. Finally, the locational population projections were determined assuming implementation of the proposed WPPP housing strategy. The results are the best available estimates for population increases in Ruth and McGill. It should be noted that, even though McGill is closer to the North Steptoe Valley Site, existing housing and services would make Ely more "attractive."

COMMENTS (SOLID/HAZARDOUS WASTE) ON
THE WHITE PINE POWER PROJECT

S9-15 ° Will any hazardous wastes be generated during the construction or operation phases? If so, how are these wastes to be handled and disposed of.

S9-16 ° Solid waste impacts on municipalities in White Pine County with the WPPP construction and operation phases are inadequately addressed in the draft EIS.

S9-17 ° A solid waste permit application, solid waste management plan, and ash management plan must be submitted and approved by the Nevada Division of Environmental Protection, Waste Management Section, before any disposal of waste can take place on-site.

S9-18 ° How and where are on-site generated sewage sludges to be disposed of?

S9-19 3.1.7.9.1 Are public lands available for additional solid waste disposal sites for municipal use under the RMP's and MFP's?

S9-20 4.1.3 The solid waste management plan and ash management plan must mitigate all possible impacts to water and air resources and conform to all State waste managment regulations.

Response to Comment S9-15: Solid, liquid, and hazardous wastes generated on the site will be isolated, collected, and disposed of in accordance with applicable state and federal regulations. The waste will also be managed consistent with plant operation and protection of the surrounding environment.

The total industrial wastes produced during normal plant operations will be collected and routed to a neutralization basin by a system of drains and piping separate from other plant drain systems. (Neutralization of industrial waste precludes characterization as a hazardous waste.) After neutralization, the reaction products will be reused to the maximum extent practical.

No hazardous wastes will be stored or disposed of on the site. The amount of waste classified as hazardous will be relatively small and will be hauled from the site and disposed of in an approved manner.

Response to Comment S9-16: Except for initial activities, all refuse generated during construction and operation will be disposed of in a sanitary landfill on the site. There may be some refuse hauled off the site during initial activities before the landfill is constructed. The amount of this refuse will have minimal impact on municipalities in White Pine County. The fly ash and scrubber reaction products will be transported by conveyor or truck to a special landfill on the site.

Measures to prevent environmental degradation due to migration of contaminants from the solid waste landfill will be taken. These will include measures to prevent fugitive dust, erosion, sedimentation, and leaching.

Response to Comment S9-17: A solid waste permit, as required in NRS 444.440 through NRS 444.620, will be obtained from the Waste Management Section of the State of Nevada Division of Environmental Protection. The solid waste management plan and ash management plan for WPPP will mitigate impacts to water resources and air resources attributable to solid waste and ash disposal and conform with state waste management regulations.

Response to Comment S9-18: All sewage sludges will be disposed of in an approved landfill. If feasible, a landfill area will be developed on the site.

Response to Comment S9-19: Nonhazardous solid waste generated during construction and operation will be disposed of in a sanitary landfill on the site. Therefore, no additional public lands will be required for WPPP solid waste disposal. As other needs arise, the Ely District BLM will respond to requests for land transfers for public purposes. All land transfers will be based on evaluation of known conflicts with other resource values.

Under the Schell Management Framework Plan (Land Objective L-2), the lands program will provide for possible future needs of state and local government agencies under the Recreation and Public Purposes Act. Identified potential needs include disposal sites. In the Egan Resource Management Plan (Chapter 2, Realty Management), lands would be disposed when such disposal would provide for more effective management of the public lands in the resource area, including disposal through the Recreation and Public Purposes Act.

Response to Comment S9-20: Included in the response to Comment S9-17.

STATE CLEARINGHOUSE
FEDERAL IMPACT
REVIEW PROGRAM

OFFICE OF COMMUNITY SERVICES
1100 EAST WILLIAM, SUITE 109
CARSON CITY, NEVADA 89710
(702) 885-4420

TO:

- ___ Governor's Office
- ___ Attorney General
- ___ Administration
- X Agriculture
- ___ Commerce
- ___ Community Services
- ___ State Job Training Office
- X Economic Development
- X Education
- X Employment Security Department
- ___ Dept. of Minerals
- ___ Equal Rights Commission
- X Human Resources, Health
- ___ Indian Commission

- ___ Labor Commission
- X Legislative Counsel Bureau
- ___ Library
- ___ Prisons
- X Public Service Commission
- ___ Taxation
- X Transportation
- X UNR-Bureau of Mines
- XX UNR-Dept. of Range, Wildlife, and Forestry
- XX Wildlife
- ___
- ___
- ___

Conservation and Natural Resources

- X State Lands
- ___ Conservation Districts
- X Environmental Protection
- X Forestry
- X Hist. Preservation & Archeology
- XX State Parks
- X Water Planning
- X Water Resources

FROM: Linda A. Ryan, Director

SAI NV # 84300038

PROJECT: DEIS, WHITE PINE POWER PROJECT

Attached for review and comment is a copy of the aforementioned project. Please evaluate it with respect to:

1) the program's effect on your plans and programs;
2) the importance of its contribution to State and/or areawide goals and objectives;
3) its accord with any applicable law, order or regulation with which you are familiar and/or
4) additional considerations.

PLEASE SUBMIT YOUR COMMENTS NO LATER THAN 12/27/83. Write out your comments if applicable, check the appropriate box below and return the form to this office. PLEASE DO SO EVEN IF YOU HAVE NO COMMENT on this particular project so that we may complete our processing. If you are unable to comment by the prescribed date, please notify this office immediately.

THIS SECTION TO BE COMPLETED BY REVIEWING AGENCY:

- ___ No comment on this project
- ___ Proposal supported as written
- X Additional information (see below)
- ___ Conference desired (see below)
- ___ Conditional support (outlined below)
- ___ Disapproval/denial of funding (must specify reason below)

Comments: (use additional sheets if necessary)

The White Pine Power Project obtained permits from the Nevada Division of Water Resources for the diversion of 25,000 acre-feet per year from various sources. A number of other conditions were imposed on the issuance of the permits including on on-going monitoring program of the water resource in Steptoe Valley.

Reviewer's Signature	Title	Phone	Date
[signature]	Hydraulic Engineer	885-4380	12/27/83

O-317

NEVADA DIVISION OF WATER PLANNING

STATE OF NEVADA
ADDRESS REPLY TO: S10
DIVISION OF WATER PLANNING
201 S. FALL STREET, NYE BLDG.
CAPITOL COMPLEX
CARSON CITY, NEVADA 89710

TELEPHONE (702) 885-4380

December 27, 1983

TO: Office of Community Services, Federal Impact Review Program

FROM: Robert E. Walstrom, Hydraulic Engineer III

SUBJECT: SAI NV # 84300038, DEIS, White Pine Power Project and Technical Reports.

The Division haa reviewed these reports and would make the following comment on the water resources portion:

Since the State Engineer has issued a water permit in the amount of 25,000 afy for the Steptoe Valley location, and that an adequate monitoring program will be undertaken and that there will be "zero" liquid discharge from the site, the Division has determined that the Steptoe Valley, the preferred site, appeara to be the best alternative out of the three available.

[This document due date for review is 12-27-83]

A DIVISION OF THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES · ROLAND D. WESTERGARD, DIRECTOR

Division of State Lands
State Land Office
State Land Use Planning Agency
(702) 885-4363

Address Reply to
Division of State Lands
201 S. Fall Street
Capitol Complex
Carson City, Nevada 89710

S11

STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Division of State Lands

January 10, 1984

Edward F. Spang
State Director, Nevada
Bureau of Land Management
P.O. Box 12000
Reno, Nevada 89520-0006

RE: White Pine Power Project DEIS

Dear Mr. Spang:

The Division of State Lands has statewide responsibilities for local planning support and federal land planning review. We have reviewed the DEIS and generally support the project. We have some concerns with specific parts of the DEIS.

S11-1

1. There is no analysis of impact on wilderness or wilderness study areas. The only recognition of wilderness is one sentence (page 3-96) that states the Goshute Canyon WSA is located west of the North Steptoe Valley site. The Goshute Canyon WSA is recommended for wilderness designation in the Wilderness DEIS. The White Pine Power Project will affect this WSA. The analysis of transmission line corridors and railroad corridors should also include impacts on wilderness areas. We note that representatives from the White Pine Power Project have commented on the Wilderness DEIS for Clark County, and, presumably, others. The Spring Valley site will also impact the Mt. Wheeler and Mt. Moriah RARE II further study wilderness areas.

S11-2

2. The Spring Valley site: This site will adversely affect the scenic values of Wheeler Peak and the Snake Range. Wheeler Peak is one of only two designated U.S. Forest Service Scenic Areas in Nevada, and has been studied as a National Park several times. Contrary to statements made in the DEIS, it seems unlikely that all impacts could be mitigated. The prevailing southwesterly winds (page 3-63) must be expected to blow pollutants (35 to 750 times the significant level, Table 4-1) into the Wheeler Peak and Snake Range area. This may additionally cause localized acid deposition. Furthermore, if the Spring Valley site is selected, the proposed powerline routing will adversely impact the Mt. Grafton and North Creek Scenic Areas. We also note that the well field proposed for the Spring Valley site could adversely affect the Shoshone Ponds, habitat for Pahrump killifish (pages 4-34 to 4-35), the BLM-Spring Valley Wetland Habitat Management Area (page 4-34) and other important aquatic habitats. These wetlands, besides being important for wildlife (page 4-34), are state natural heritage sites for their swamp cedar, white sage and pygmy sage. This site, more than any of the others, would have a visual impact on visitors, being located in such close proximity to highways 93 and 6/50. We also note that "the State Engineer granted water permits to the White Pine Power Project subject to . . . the siting of the White Pine Power Project . . . Steptoe Valley."

<u>Response to Comment S11-1</u>: A discussion of the impacts to wilderness is included in Section 4.1.7.8.2 which has been added to the Final EIS. It should be noted that Wheeler Peak and Mount Moriah are no longer "Rare II Further Study Areas." All roadless areas in the Humboldt National Forest are being reevaluated for suitability as wilderness.

<u>Response to Comment S11-2</u>: Winds in Spring Valley near the height of the WPPP stacks blow primarily north and south with only a small percentage of winds from the west. Therefore, most emissions would not be transported to Wheeler Peak or the Snake Range. Air quality modeling indicates that the calculated annual average sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) concentrations in the vicinity of Wheeler Peak are approximately 0.06 micrograms per cubic meter each, or approximately 6 percent of the EPA annual significance level of 1 microgram per cubic meter. Conversion of SO_2 and NO_2 to acidic sulfates and nitrates is relatively slow and concentrations of the acidic substances would be much less than SO_2 and NO_2 concentrations. In addition, only a small percentage of sulfates and nitrates transported over the Wheeler Peak area would be expected to undergo deposition there. Therefore, acid deposition impacts in the Wheeler Peak area are expected to be negligible.

Section 4.1.6 has been revised in the Final EIS to provide additional information on impacts to visual resources. It is recognized that locating at the alternative Spring Valley Site would require a new water permit from the State Engineer.

S11-3 3. The power transmission system should include "proper tower designation" to minimize wildlife electrocutions. It is stated in the DEIS that this "can be" done, not that it will be done.

4. Due to many adverse impacts, cited in #2 above, and identified in the DEIS (Figure 3-8, 3-17, 4-4, 4-9, 4-10, and elsewhere), the powerline should NOT go through Spring Valley. We also support the BLM preferred corridor rather than the White Pine Power Project corridors going west to the Machacek Substation.

S11-4 5. It would be helpful to reviewers if the White Pine Power facility were compared in size and impacts to other existing facilities. Most reviewers may not be able to visualize what a 1500 megawatt, coal-fueled, steam-electric generating facility would look like. If it were compared to the Navajo Power Plant (Page, Arizona) or X times the Valmy Power Plant or some other familiar facility, then the proposal's scale could be more readily evaluated.

S11-5 6. The purpose of the DEIS is stated (page 2-1) to be so that BLM can decide whether to grant the White Pine Power Project rights-of-way. Are the three alternative power plant sites also on public lands?

S11-6 7. Under discussion of seismicity, it is stated that within the life of the project, an earthquake could occur along active faults (pages 3-4 and 3-5). Figure 3-2 indicates each of the three sites is on or very near a major fault. Yet under the analysis of geologic hazards at each site, it is merely stated that the potential for "strong ground motion" is low (pages 3-49, 3-53, and 3-55).

S11-7 8. The minimal discussion on soil collapse due to the mining of ground water (page 3-6) seems to be a significant possible hazard, yet the water supply well fields are located immediately adjacent (Butte Valley) or directly below (North Steptoe and Spring Valley) the proposed power plant sites. Please expand the soil collapse or soil compaction analysis.

S11-8 9. Native American considerations are discussed only in a general sense (pages 3-27 and 3-28). There is no site specific analysis of these impacts in the three site alternatives.

Thank you for the opportunity to comment on this DEIS. We hope that your inclusion or expansion of comments on the listed concerns will make for a better project.

Sincerely,

Pamela B. Wilcox
Administrator

PBW:JMH:js

Response to Comment S11-3: Typical mitigation measures associated with the WPPP power transmission system were discussed in the Draft EIS. The actual measures that will be committed to will be included in the stipulations associated with the right-of-way grants. These stipulations will depend on the final right-of-way location and the final design of the transmission towers.

Response to Comment S11-4: The WPPP will be most similar to the Intermountain Power Project now under construction near Delta, Utah. It is also similar in size to the Navajo Generating Station near Page, Arizona. Both of these facilities are familiar to many residents of White Pine County. In addition, the 750-foot-high stacks at WPPP will be approximately the same height as the tall stack at the McGill smelter.

Response to Comment S11-5: All three WPPP sites are on public lands.

Response to Comment S11-6: Section 3.1.1.4.1 states that recurrence intervals for large (Richter Magnitude $\geq$ 6) earthquakes on faults in the Basin and Range Province are estimated to be a few thousand to several hundred thousand years long. Therefore, the probability of strong ground motion from a nearby major fault during the lifetime of the project is very low.

Response to Comment S11-7: Ground subsidence can occur whenever groundwater, oil, or minerals are extracted from the subsurface strata. Based on preliminary geotechnical investigations pertaining to the effects of groundwater withdrawal, the predicted amount of ground subsidence for an assumed 50 feet piezometric drawdown and conservative interpretation of soil parameters ranges from 3 to 12 inches in North Steptoe Valley, 2 to 24 inches in Spring Valley, and 1 to 8 inches in Butte Valley. This subsidence will be localized around the well area, the only places where drawdowns of 50 feet are estimated. Therefore, to minimize the potential impact of subsidence, wells on the site will be located at least 1/2 mile away from settlement sensitive structures.

Response to Comment S11-8: Regional information on Native American considerations provided in Section 3.1.5.3 is applicable to each of the three WPPP sites. It should be noted that site-specific discussions are avoided because of the confidentiality of such information.

RICHARD H. BRYAN
Governor

STATE OF NEVADA

ROLAND O. WESTERGARD
State Historic Preservation Officer

S12

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF HISTORIC PRESERVATION AND ARCHEOLOGY
201 S. Fall Street
Capitol Complex
Carson City, Nevada 89710
(702) 885-5138

January 6, 1984

Mr. Edward F. Spang
State Director, Nevada
Bureau of Land Management
Nevada State Office
300 Booth Street
Reno, NV 89520

Dear Mr. Spang:

I have reviewed the DEIS and Cultural Resources Technical Report for the White Pine Power Project. The technical report, which is well written and presents data clearly, reveals the presence of archeological and historical sites eligible for and listed on the National Register in the project area.

S12-1 The preferred alternative, the North Steptoe Valley Site, is the most archeologically sensitive of the three WPPP sites examined and has a high potential for cultural resources of Register quality. The proposed Machacek Powerline Corridor would impact the Sunshine locality, a significant pre-Archaic archeological district listed on the National Register. The Nevada Northern Railroad is proposed for utilization as part of the coal transportation system. This railroad system is probably the best existing representative of a short line rail operation in the country and is clearly eligible for inclusion in the Register.

The proposed project will affect known significant cultural resources as well as those not previously identified. I concur with the BLM that these potential effects can be negated through the formulation and implementation of a cultural resources plan. A memorandum of agreement will facilitate the preparation of such a plan. I have just received and reviewed the revised MOA developed by the Advisory Council on Historic Preservation. I prefer this version because it gives greater consideration to Native American concerns and indirect impacts of the project. I would recommend no changes other than to note that under Stipulation B.3.d., the title of our plan is An Archaeological Element for the Nevada Historic Preservation Plan.

Mr. Leslie A. Monroe
January 6, 1984
Page 2

I have no further comment at this time. During the development of the plan, please consult with Alice M. Becker, the staff archeologist.

Sincerely,

ROLAND WESTERGARD
State Historic Preservation Officer

cc: Advisory Council on Historic Preservation

Response to Comment S12-1: The southern boundary of the township that includes the Sunshine Locality (T20N, R58E) is the northern boundary of the study corridor for the Northern Transmission System preferred corridor. The original corridor alignment took into consideration avoiding the archaeological area.

STATE OF NEVADA

RICHARD H. BRYAN
Governor

LINDA A. RYAN
Director

STATE OFFICE OF COMMUNITY SERVICES
Capitol Complex
Carson City, Nevada 89710
(702) 885-4420

January 27, 1984

Edward F. Spang, State Director
Bureau of Land Management
P.O. Box 12000
Reno, Nevada 89520

Re: SAI NV No. 84300038 Project: DEIS White Pine Power Project, 1792, N-34895

Dear Mr. Spang:

Attached is an additional comment from the Nevada Division of State Parks that was received after our previous letter to you.

Sincerely,

John B Walker

John B. Walker, Coordinator
Clearinghouse Program

JBW/aa

Enclosure

S13

WHITE PINE POWER PROJECT DEIS COMMENTS

The Nevada Division of State Parks has responsibilities for statewide comprehensive Outdoor Recreation planning. We have reviewed the DEIS and generally support the project. We have some concerns with specific parts of the DEIS.

S13-1

1. The impact on the proposed wilderness areas is not addressed. Construction of the WPPP will have adverse impacts in each location. The Goshute Wilderness Study Area is west of the North Steptoe Valley Site and would be affected by the project. The Goshute Study Area contains both Goshute Cave and Goshute Canyon, which are both noted natural landmarks and listed in Nevada's Natural Heritage Plan. In the Egan Technical Draft they mention the Goshute Study Area as a possible repeater location, which will eliminate wilderness designation. We feel that other suitable repeater locations can be found. The Spring Valley Site will also impact Mt. Wheeler and Mt. Moriah Wilderness Study Areas.

2. The Spring Valley Site will have a major impact on the ecological, cultural, and visual resources due to the construction of the railroad for coal transportation. This will adversely affect the scenic values of Wheeler Peak and the Snake Range. Also, we do not recommend the powerline through Spring Valley; we instead support the BLM preferred corridor.

S13-2

3. We disagree with the socioeconomical analysis of the effect on recreation. We feel additional study is necessary and should include occupancy rates at nearby State Park units. In 1980 our average occupancy rates were 97%. In 1981 with the addition of a new campground, our occupancy rate dropped to 75%, but this is still twice the USFS rate as listed at 35%. On holiday weekends we averaged over 100% occupancy. Development will increase demand and subsequent visitor problems.

S13-3

4. The transient population is not addressed in the population studies. Although the peak construction population is estimated at 2345, we note an increase of 4400 with family members added in. This is a 50% increase in the resident population of the county. The transient population is not estimated. We feel it will be substantially higher (15-30%), considering the employment situation. The population increase will impact outdoor recreation facilities. With the noted housing shortages, we anticipate problems of workers and transients trying to establish residence in our parks due to lower costs for occupancy.

Overall we feel the North Steptoe Valley site would be preferable over either the Butte Valley or Spring Valley sites because it would cause the least disturbances to the environment and wildlife. We would like to review the final EIS with the additional research to study the full impact at the North Steptoe site.

Thank you for the opportunity to comment on this DEIS. We hope that your inclusion or expansion of comments on the listed concerns will make for a better project.

Response to Comment S13-1: A discussion on the impacts to wilderness is included in Section 4.1.7.8.2 which has been added to the Final EIS. It should be noted that Wheeler Peak and Mount Moriah are no longer "Rare II Further Study Areas." All roadless areas in the Humboldt National Forest are being reevaluated for suitability as wilderness. In addition, it should be noted that no WPPP microwave repeater stations are planned in the Goshute Canyon Wilderness Study Area.

Response to Comment S13-2: Section 4.1.7.8 has been revised in the Final EIS to provide additional information on impacts on recreation.

Response to Comment S13-3: Section 4.1.7.8 has been revised in the Final EIS to provide information on impacts on recreation due to transient population.

5.4.4 Local Agencies

The following local agencies provided written comments on the Draft EIS:

- L1 Clark County - Department of Comprehensive Planning
- L2 City of Henderson
- L3 White Pine County - Industrial Park Review Board
- L4 White Pine County - Regional Planning Commission

Clark County

Department of Comprehensive Planning
(L1)
DONALD L. "PAT" SHALMY
DIRECTOR
RICHARD B. HOLMES
ASSISTANT DIRECTOR
CLARK COUNTY BRIDGER BUILDING
225 BRIDGER AVENUE, SEVENTH FLOOR
LAS VEGAS, NEVADA 89155
(702) 386-4181

November 21, 1983

State Director, Nevada (NV-933.2)
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street
P.O. Box 12000
Reno, Nevada 89520

WHITE PINE POWER PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT

We have reviewed the White Pine Power Project Draft Environmental Impact Statement and in general find the report to be an inadequate and incomplete analysis of the issues and impacts which are relevant to Clark County and its associated jurisdictions.

In specific we offer comments on the following topical concerns:

Socioeconomic Impacts

L1-1 As would be expected, the document provides a great deal of analysis regarding the anticipated socioeconomic impacts on White Pine County related to the main plant siting decision. A great deal of detail on the positive economic benefits to White Pine County is provided. Unfortunately, the same level of analysis was neglected for those project elements situated outside of White Pine County. In this manner, engineering considerations became more important than social or environmental concerns. As such, Clark County and the City of Henderson will be subjected to aesthetic impacts which may possibly devalue the environmental amenities of the Clark County Wetlands Park and which may alter development patterns in the City of Henderson.

It appears that these impacts have been ignored because the White Pine power transmission corridor analysis is considered on a stand alone basis, rather than in a more comprehensive fashion, which would include the cumulative influence of the Navajo, IPP, and Allen Warner impacts. The specific corridor selection concerns will be elaborated upon in more detail later in this correspondence.

Response to Comment L1-1: Information on the economic benefits of WPPP to the State of Nevada, including Clark County and the City of Henderson, is included in Section 4.1.7.10 which has been added to the Final EIS.

The study corridor for the WPPP power transmission system in Lincoln County and Clark County parallels or coincides with corridors associated with the transmission systems for the Intermountain Power Project (IPP) and the Harry Allen Generating Station which were evaluated in separate environmental impact statements. Between Gypsum Junction and Eldorado Junction (which includes the "Henderson Corridor") impacts were identified in the IPP Environmental Statement. The corridor crosses some areas with moderate to high erosion hazard, with high scenic quality, and with Bighorn sheep habitat. Aesthetic impacts included visibility from residential areas of Henderson. This impact was also identified as an adverse impact which could not be avoided.

The cumulative influence of transmission lines in the "Henderson Corridor" was recognized early and has been part of discussions regarding the application for the IPP Conditional Use Permit from the City of Henderson.

Coal Source and Coal Transportation Alternatives

Coal source and transportation factors represent the controlling economic influences in power plant siting in the southwest. Availability of a cheap source of fuel which can be utilized with a minimum of transportation costs is generally considered essential in power plant siting. For this reason the Great Basin has become the "womb" for the birth of Southern California and Southwest United States power reserves. It is this economic fact of life which is the root of the many negative social and environmental impacts of this and similar projects.

For the last several years the Department of Interior, in conjunction with private industry, has been pursuing the development of the Aquatrain. This project purports benefits in the way of coal transportation costs as well as water quality and quantity. Additionally, if successful, the project offers the potential to dramatically influence siting and project alternatives in such a manner as to make it possible to move the burden of negative impacts closer to those who will be benefitting. As Aquatrain is a Department of Interior project, it is inconceivable that the consideration of Aquatrain as a coal transportation alternative, let alone its potential impact on power plant siting, has not been evaluated as part of the White Pine power project Draft EIS. Many power plant siting decisions were made in a preliminary form in the early 1970s. It is possible that with the changing demand which has sidelined many projects, and the advent of new technologies, that these earlier decisions may now be ripe for review.

L1-2 The failure of the Draft EIS to consider Aquatrain or similar technologies eliminates more than the consideration of coal transportation options. Industry participation in these projects would serve to make them more feasible providing mitigation measures for many identified negative impacts.

Project Alternatives

L1-3 Although a variety of project alternatives were analyzed, one notable exception in line with the above comments exists. The alternative of moving the plant closer to the source of use would mitigate many of the siting, water supply, and transmission system impacts on portions of Nevada. As mentioned before, such an approach would also enhance the viability of systems such as Aquatrain.

The Department of Interior has a great stake in White Pine or any other major power generation facility which utilizes federal lands for siting, transmission, and fuel production. For these reasons, and others, the Department of Interior has chosen to participate in projects such as Aquatrain. Industry response may be that such considerations would delay project construction. Such delay, however, may already be built into the project proposal given the opposition which transmission corridor elements of other similar projects have faced.

Response to Comment L1-2: The selection of the WPPP preferred site, discussed in Section 2.2.2, was based on proven technologies, including modes of transportation. The alternative of coal transportation by slurry was evaluated and is discussed in Section 2.2.5.2. The Aquatrain Project, which is still in the conceptual design phase, would use liquid carbon dioxide as a transport medium for coal. This technology has not been demonstrated to be commercially feasible on a large scale. There have been discussions between WPPP and Aquatrain Project representatives and the mutual understanding is that any coal delivered by Aquatrain Project would be considered by WPPP, provided that the coal would be available at competitive prices during WPPP operation. However, because significant design changes would be required in the WPPP power generation system to handle a coal of this type and because the future of the Aquatrain Project is uncertain, a definite commitment cannot be made at this time. (It should be noted that the route of the Aquatrain Project is based on existing and proposed sources and markets and is, therefore, dependent on the WPPP site and not the reverse as implied in the comment.)

Response to Comment L1-3: The location of the WPPP site was limited to White Pine County, Nevada, because of the requirements of amendments to the County Economic Development Revenue Bond Law. These amendments, included in Chapter 244 of the Nevada Revised Statutes, were signed into law in May 1979 and state that the "legislature approves in general terms ... a project for the generation and transmission of electricity whose generating facilities are to be located in White Pine County, and fixes the limit of the capacity of its generating facilities at 1500 megawatts nominally rated."

Transmission System Alternatives

L1-4 It is stated on page 2-47 of the DEIS that twelve (12) alternative transmission system alternatives were analyzed by the White Pine Power Project Transmission System Planning Committee. Little of any detail was provided as to the reasoning behind identification and selection of particular corridors, presented in the DEIS as "schemes". In fact, without such detail, it must be assumed that, just as with IPP and Allen Warner, a de facto decision to utilize the Las Vegas Valley was made. Given the criteria, it is obvious that technical and economic considerations had the highest priority.

L1-5 Just what was meant by ". . . minimize impact to private lands . . . " (DEIS, page 2.50) is uncertain. Was this related to avoiding such lands so as not to have to purchase right-of-way; in which case the impact avoided is an industry economic concern, or does it mean avoiding related aesthetic and socioeconomic impacts as well? In line with earlier comments, it is questionable as to whether the socioeconomic impacts analysis required under 43 CFR 2806.2(b) was a major concern, and that the aforementioned phrase was used as criteria in a broad brush manner to satisfy regulatory requirements.

L1-6 Of considerable concern in this and similar impact statements is the lack of a comprehensive corridor analysis. It is apparent that 43 CFR 2806.2-1(b) recognizes an EIS as a valid means of corridor analysis. Nonetheless, Clark County is now faced with an assumption (by the power industry and apparently by BLM) that a corridor exists through Las Vegas Valley which may be required to accommodate up to seven lines by the year 2000. The potential for such an occurrence has been recognized since the late 1960s, and plans for the Navajo, IPP, White Pine, and Allen Warner transmission systems have been in some form of simultaneous development for the last several years. Yet none of the associated impact studies pays other than lip service to the cumulative impacts of these associated projects, and analysis occurs as if each project would not be affected by the other. Thus, the question of how many is too many is avoided.

In 1970 the Department of Interior published a study entitled "The Impact of Power Transmission Lines and Their Effect on the Southwestern Environment." While the report was precipitated by the pending Navajo project, it did recognize the potential need to house as many as ten transmission lines in a set of corridors that traversed the north (Las Vegas Valley) or south side of Lake Mead. At that time the southern corridor was the established corridor and no Las Vegas Valley right-of-way existed. In its discussion of the northern and southern routes, the report stated that many transmission lines in a single corridor would have an adverse scenic and open space impact. The report further stated that many lines together can make it difficult to screen them from visual sight. The report did not analyze the impacts of such intensive use of a single corridor and did not recommend mitigation techniques and cannot, therefore, be considered a comprehensive corridor analysis. The report did, however,

Response to Comment L1-4: Section 2.2.3.1 has been revised in the Final EIS to provide additional information on preliminary transmission studies including alternative systems. The selection of the preferred and alternative corridors after the preferred transmission system was selected is discussed in Section 2.2.3.4. Additional information on alternative corridors is included in the response to Comment L2-1.

Response to Comment L1-5: Because 88 percent of the State of Nevada is publicly owned and in the public domain and only 12 percent is privately owned, the selection of transmission line corridors was based in part on the minimization of use of private lands. This was one of nine criteria listed in Section 2.2.3.4. It should be noted that the requirements of 43 CFR 2806.2(b) apply to the designation of right-of-way corridors. The WPPP transmission corridor is a study corridor and not a designated corridor.

Response to Comment L1-6: A comprehensive corridor analysis was not performed because all five of the transmission lines proposed for the area have been evaluated in environmental impact statements. No future transmission lines that could be considered under an analysis performed as a part of 43 CFR 2806 are anticipated at this time. The cumulative influence of transmission lines in the "Henderson Corridor" was recognized early and has been a part of ongoing discussions with Clark County and the City of Henderson.

L1-7 recognize the problem which has been effectively ignored to date. By studying each proposal in separate impact statements it is easy to discount the visual impact of each new transmission line proposed. Page 4-57, of the draft White Pine EIS exemplifies such discounting.

It should be pointed out here that for many of the same reasons the Navajo line received much the same opposition that the IPP line currently faces and which the White Pine line can be expected to encounter.

Recommendations

L1-8 Section 504 of the Federal Land Policy Management Act requires a right-of-way plan of construction, operation, and rehabilitation. Inclusion of such plans as mitigation measures has been customary in previous power plant impact studies. Clark County suggests that these plans be included in an appendix to the final EIS. Appendixes 4 and 6 of the Allen Warner Valley EIS provide appropriate examples.

L1-9 At a minimum the EIS should provide a complete corridor study, with alternatives, which addresses both the comprehensive impacts of cumulative related projects, as well as other alternatives for power transmission through or around the Las Vegas Valley.

We have appreciated the opportunity to comment on the White Pine Power Project Draft Environmental Impact Statement. Should there be any questions regarding our comments, please feel free to contact our offices.

Sincerely,

DEPARTMENT OF COMPREHENSIVE PLANNING

Donald L. Shalmy
Director

DLS:sg

Response to Comment L1-7: It is recognized that there could be cumulative adverse visual impacts from the routing of several transmission lines within a two-mile-wide corridor. To the extent possible, mitigative measures described in Section 4.1.6.5 will be used to reduce impacts.

Response to Comment L1-8: The right-of-way plan of construction, operation, and rehabilitation will be prepared subsequent to a grant of right-of-way. This has been customary in previous power projects. Mitigative measures that could be included in the plan are included in Chapter 4 of the EIS.

Response to Comment L1-9: Included in the responses to Comment L1-4 and Comment L1-6.

L2

CITY OF HENDERSON

CITY HALL 243 WATER STREET 702/565-8921
HENDERSON, NEVADA 89015

Gateway to Lake Mead Resorts

December 15, 1983

Mr. Edward F. Spang
U. S. Dept. of Interior
Bureau of Land Management
P. O. Box 12000
Reno, NV 89520

Dear Mr. Spang:

Enclosed are my comments regarding the Draft Environmental Impact Statement for the White Pine Power Project. These comments are given to you in writing as follow-up information subsequent to the Public Hearings recently held at the Union Plaza Hotel in Las Vegas and in the City of Henderson.

If you have any questions regarding the enclosed document or require further clarification of any of the points I have brought out, please call me at 565-2088.

Sincerely,

Richard C. Heckendorf
Director, Planning Department

RCH/njd

Encl.

EVALUATION

DRAFT ENVIRONMENTAL IMPACT STATEMENT

WHITE PINE POWER PROJECT

Richard C. Heckendorf

Director, Henderson Planning Dept.

The Bureau of Land Management has apparently contracted with a consulting firm to prepare this EIS. Apparently they have not monitored that action.

L2-1 The firm chose to call upon the IPP EIS for format and approach. The City of Henderson has challenged that EIS in court and has twice denied a request for a Use Permit for transmission lines through its incorporated area. This EIS certainly is timely enough to have recognized that litigation, yet outright ignores it.

Our criticism of the IPP EIS was based on the one observation that the vast majority of effort was placed on the site (or sites) of the coal burning generating station. All comments regarding the transmission lines have been buried here and there throughout the document. All references were to a power line "corridor" as though such a "hallway" was in existence for any and all facilities. The White Pine Power Project is exactly the same.

L2-2 Mentioned in the scoping system pages, 1-5 and 1-6, the EIS says that written comments were received from two federal agencies, two organizations and seven Nevada agencies in a 45-day period and were incorporated. Who did you ask and who responded? The Planning Department of Henderson has no record of being asked to respond.

The EIS in Chapter 2 describes the preferred corridor for the Southern Transmission System of approximately 325 miles and 13,000 acres. Twelve of

<u>Response to Comment L2-1</u>: A Conditional Use Permit (CUP) application for the part of the Intermountain Power Project (IPP) transmission line within the City of Henderson was initially filed on September 2, 1980. Objections were subsequently raised on the grounds that location of the transmission line would, among other things, affect future land development within the city.

On May 3, 1983, a lawsuit captioned Citizens for a Better Henderson, et al., v. James G. Watt, Secretary of the Interior, et al., was filed in the U.S. District Court for the District of Nevada (District Court) challenging the proposed location of the IPP high-voltage direct current transmission line within Henderson. The plaintiffs were a Henderson citizens group, a private land developer, the City of Henderson, and the Nevada Wildlife Federation, Inc. (an affiliate of the National Wildlife Federation). Named as defendants in the action were the Secretary of the Interior together with various subordinate federal officials, IPP, and the Department of Water and Power of the City of Los Angeles (LADWP).

The plaintiffs complaint made four basic claims, namely: 1) that the federal defendants did not prepare an adequate EIS prior to issuing the right-of-way through Henderson and thereby failed to comply with the National Environmental Policy Act (NEPA); 2) that the grant of the right-of-way through Henderson constituted the designation of a transportation and utility corridor under the Federal Land Policy Management Act (FLPMA) and that FLPMA requires the consideration of the Henderson land use plan before such a designation can be made; 3) that federal authorization does not relieve IPP and LADWP from the necessity of obtaining a CUP from Henderson in order to locate the IPP transmission line within Henderson; and 4) that the right-of-way grant issued by the BLM for the IPP transmission line is legally ineffective with respect to certain lands in and about Henderson which have been withdrawn from BLM jurisdiction by the Bureau of Reclamation of the U.S. Department of Interior. Among other things, the plaintiffs sought: 1) a declaration that NEPA and FLPMA had been violated; 2) a declaration of the rights of the parties under NEPA, FLPMA, and state and local law; 3) a writ requiring the preparation and consideration of a site-specific environmental statement regarding the IPP transmission line in the vicinity of Henderson; and 4) an injunction against further action with respect to the IPP transmission line until the defendants have complied with plaintiffs asserted requirements of federal law.

On September 6, 1983, the plaintiffs (other than Henderson) filed a motion for a preliminary injunction against any action in furtherance of the construction of any part of the IPP transmission line pending the completion of the trial in the lawsuit. On October 7, 1983, the plaintiffs applied for a temporary restraining order (TRO) against the construction of the IPP transmission line within Clark County pending the District Court determination of the motion for preliminary injunction. On October 25, 1983, the District Court denied the plaintiffs application for a TRO. Following a January 14, 1984 hearing on the plaintiffs underlying motion for preliminary injunction, the court declined to order any preliminary relief.

The case was tried during the week of April 23, 1984. At the time of the trial, the District Court, by legal ruling, dismissed the FLPMA claim, and plaintiffs failed to pursue the withdrawn lands claim. Following the trial, the District Court, on June 4, 1984, filed its decision determining the EIS was adequate and further determining that the Henderson local zoning laws are preempted by the federal right-of-way grant so that IPP need not secure a CUP from Henderson. A judgment dismissing the plaintiffs complaint was concurrently entered. Plaintiffs have filed a notice of appeal.

those miles and 450 of those acres are in Henderson. But then, since the authors failed to show Henderson on their maps, it is obvious they could not know of those 450± acres.

The terminal point of the transmission system is the McCullough switching station in El Dorado Valley. One cannot get from the north to that point without going through Henderson, the River Mountains or the Lake Mead Recreational Area unless one goes around to the west. Apparently the Lake Mead National Recreation Area is off limits, the River Mountains are expensive to traverse and since there is no mention of either, or of a circular route around, one must assume through Henderson is acceptable. Boulder City is shown as a participant. The same comments above describe the method to get to Boulder City.

L2-3 Nevada Power is a 1/4 "consumer." They have lines from El Dorado Valley into Las Vegas Valley. Those lines go through Henderson. Would additional lines be needed to get their 25 percent to Las Vegas? One can guess how they will be routed--your EIS fails to mention this.

L2-4 On page 2-22 there is a list of Interrelated Projects.

-IPP/What's the relationship? Why aren't the problems with Henderson and IPP mentioned?

HAGS/This is deferred to the mid-1990's.

MX/Dropped in 1981--why mention it?

Aquatrain/WPPP says it is not a part of this project. Why not? Seems like as viable a method of obtaining coal as building a new railroad.

Response to Comment L2-2: A statewide news release on scoping was distributed in addition to the notice published in the Federal Register on February 4, 1982 (47 FR 5360). A request for comments was also sent to the State of Nevada. Scoping comments were received at public meetings in Reno, Carson City, and Ely. Other respondents included the Environmental Protection Agency (Region IX), the National Park Service, the Interstate Commerce Commission, the Sierra Club (Toiyabe Chapter), the Ruth Town Council, and the White Pine MX Human Services Planning Team. In addition, the State of Nevada Governor's Office of Planning Coordination provided comments from the Department of Wildlife, the Department of Transportation, the Office of Community Services, the Division of Mineral Resources, the Division of Forestry, the Division of Historic Preservation and Archaeology, and the Division of State Parks.

Response to Comment L2-3: The WPPP Southern Transmission System will terminate at McCullough Switching Station. Distribution of power to Southern Nevada participants will be over existing transmission lines and future transmission lines planned to provide for future growth in the area, including the City of Henderson. Preliminary planning by Nevada Power Company (NPC) indicates the need for another 230 kilovolt transmission line to an unspecified terminal in the Las Vegas Valley when WPPP is constructed. According to NPC, such line will be largely independent of WPPP.

Response to Comment L2-4: The purpose of Section 2.1.7 in the Draft EIS (Section 2.1.8 in the Final EIS) was to list major projects (either existing or proposed) in the general vicinity of WPPP so that the reviewer would be aware of relationships, if any, with WPPP. Project status was listed for those who may not have been aware of deferments or cancellations. Information on litigation associated with IPP is included in the response to Comment L2-1. Information on the Aquatrain Project is included in the response to Comment L1-2.

L2-5 Local Zoning/WPPP is not a part of the County General Plan. A conditional use permit may be required. (We assume White Pine County action.) Its transmission system is not a part of Henderson's General Plan either and it definitely will require a conditional use permit.

L2-6 On page 2-48 there appears a simple statement to the effect that a third scheme includes a new ±500 kv dc transmission line westerly to California then southerly to the Valley Generating Station in the Los Angeles area. That's it, that's all there is! It's not shown on maps; there is no other description of this proposal. We find it ironic that far more is written on how to build a railroad, a method which has been in use for at least 90 years, than is written on the very important aspect of an alternate route.

L2-7 If IPP is a related project, why on page 2-49 does it refer to a preferred system of transmission modified to include (2) 500 kv ac lines between HAGS and McCullough and to exclude the upgrade of the IPP line?

L2-8 On page 2-50 there is a statement with regard to Preferred and Alternative Corridors. Meetings were held with governmental agencies to determine specific constraints or possible restrictions for unique corridors. Why so shy? Who were these agencies and when were the meetings held? The considerations were the environmental impacts of potential corridors including impacts on land use. Our major complaint with IPP is its considerable impact on land use in Henderson. Our major complaint with WPPP is exactly the same.

On page 3-97 the transmission corridors are discussed with regard to Highways US 50, US 6 and US Highway 93 near Ely, and State Highways 38 and 7, then states the corridors do not contain major permanent or recreational

<u>Response to Comment L2-5</u>: A Conditional Use Permit may be required for transmission lines through the City of Henderson. Additional information is included in the response to Comment L2-1.

Information on litigation associated with the City of Henderson is also included in the response to Comment L2-1. At the trial, the Director of the Henderson Planning Department testified that the City of Henderson follows no formal land use plan and has not since he came to the Department in 1977. In addition, the director testified that, in the absence of such a plan, it has been the practice of the City of Henderson to consider land use proposals on a case-by-case basis.

<u>Response to Comment L2-6</u>: Section 2.2.3.1 has been revised in the Final EIS to provide additional information on preliminary transmission studies, including alternative systems. Additional information on alternative corridors is included in the response to Comment L2-1.

<u>Response to Comment L2-7</u>: Included in the response to Comment L2-4.

<u>Response to Comment L2-8</u>: Meetings began in August 1981 with government agencies and were primarily between WPPP representatives and the Bureau of Land Management (BLM) district offices because BLM administers most of the land within the transmission corridors. On October 24, 1978, a meeting with the Clark County Regional Planning Council included a discussion of the WPPP power transmission system. It should be noted that information on the number and location of WPPP transmission lines was included in the original Intermountain Power Project (IPP) application for a Conditional Use Permit (CUP) from the the City of Henderson which was submitted on September 2, 1980. Ongoing discussions with the City of Henderson on the IPP CUP application included the WPPP power transmission system. It should also be noted that, during early discussions, officials of Henderson actually encouraged the location of the IPP transmission line within the city limits of Henderson.

population. Your "corridor" crosses State Route 146, one of the major accesses to the Lake Mead National Recreation Area and then crosses US 93-95 at the brow of Railroad Pass, a spectacular first view of Henderson and the Las Vegas Valley. Page 4-57 contains the statement that "Visual impacts would be greatest where corridors cross highways, resulting in foreground open superior views to travelers on the highway. However, such views would be of relatively short duration and would affect limited numbers of people."

L2-9 Perhaps someone should count the traffic on State Route 146 to the lake and on US 93-95 to determine how many people would be forced to traverse under these proposed lines.

The EIS was sent to a large variety of agencies. Our City Manager received the only Henderson copy. Newspapers all over received copies, but the Henderson Home News did not and the Henderson Library was ignored. Two state legislators received them, but not Henderson's legislative delegation. In short, we are of the opinion the authors did not do much homework. Some of 3heir research did not pertain, yet was included. They borrowed from an EIS

L2-10 that is not acceptable. The BLM did a poor job of distributing copies, and a worse job of holding hearings. (Witness Henderson's having to insist upon a hearing in Henderson.)

L2-11 This EIS needs to be rewritten. It needs a two-part format--one part plant site and one part transmission system. It must consider the impact on Henderson in that transmission system and it must have Henderson input. Some comment must be made as to the safety of 500 kv transmission lines. We'll repeat the comment given in Las Vegas. This EIS is worthless to the City of Henderson.

Response to Comment L2-9: Figure 3-7, Figure 3-8, and Figure 4-20 in the EIS recognize the scenic quality of State Route 146 and U.S. Highway 93/95.

Response to Comment L2-10: A news release announcing the availability of the Draft EIS, as well as the time and location of public hearings, was sent to newspapers and television and radio stations in the Las Vegas area. The news release was also sent to the Henderson Home News. When requested, additional copies of the Draft EIS were provided to the City Manager of the City of Henderson.

It should be noted that most of the individuals at the Las Vegas public hearing were from Henderson and they adequately expressed their opposition to the WPPP power transmission system. However, a subsequent hearing was held in Henderson at the request of its City Manager. Comments at this hearing were similar to comments at the Las Vegas hearing.

Response to Comment L2-11: The format of the EIS is adequate in that the Table of Contents identifies sections associated with the WPPP power transmission system. Information on impacts relative to the City of Henderson is included in the response to Comment L1-1. Information on the electrical effects of power transmission lines is included in Section 4.1.8 which has been added to the Final EIS.

L3

REGIONAL PLANNING COMMISSION

of White Pine County

PHONE 289-3261 CITY HALL, ELY, NEVADA 89301 P. O. BOX 622

27 December 1983

Mr. Edward F. Spang, State Director
Bureau of Land Management NV 933
300 Booth Street
Post Office Box 12000
Reno, Nevada 89520

Re: White Pine Power Project Draft Environmental Impact Statement

Dear Mr. Spang;

At their regular meeting of Thursday, December 15, 1983, the Regional Planning Commission wholly endorsed aod affirmatively voted to support the acceptance of the White Pine Power Project Draft Environmental Impact Statement as prepared and made available to the public on October 20, 1983.

Sincerely yours,

Nancy M. Swallow

Naocy M. Swallow, Chairman
Regional Planniog Commission

NMS/kdp

cc: White Pine County
Board of County Commissiooers

White Pine County
Regional Planning Commissioo

L4

WHITE PINE COUNTY

INDUSTRIAL PARK REVIEW BOARD
Box 630
Ely, Nevada 89301

December 19, 1983

State Director, Nevada (NV-933.2)
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street; Post Office Box 12000
Reno, Nevada 89520

Gentlemen:

The Industrial Park Review Board has reviewed the Draft Environmental Impact Statement on the White Pine Power Project. The Board feels that the Draft E.I.S. and baseline technical reports adequately address the community's concerns and demonstrates that the project is compatible with economic development efforts in the county.

The analvsis of impacts to air qualtiy shows that the power project will contribute to air pollution in Steptoe Valley duriog both the construction and operation phases. However, the White Pine County Air proposal would reduce total emissions in Steptoe Valley. With this "agreement" in place, the project will not hamper efforts to locate firms in the industrial park. In addition, the analysis of the project's impact on water resources indicates that the project's use of water resources in Steptoe Valley should be closely monitored to ensure it does not adversely affect the county's agricultural industry.

The analysis of socio-economic impacts is based on two years of studv by thirteen committees made up of community residents and addresses a wide range of positive and negative impacts of the project. The Industrial Park Review Board feels that the White Pine Power Project will have a positive impact on the county. Employment opportunities, the increased consumer base and increased tax revenues will help to improve the county's economic base and quality of life. The proposed mitigation strategies have been developed with the support of White Pine County, the City of Ely, and the White Pine County School District, and will help to minimize the negative socio-economic impacts identified.

The White Pine County Industrial Park Review Board is pleased to endorse the Draft Environmental Impact Statement and to express its continued support of the White Pine Power Project.

Sincerely,

Art

Art Olson, Chairman

5.4.5 Private Organizations

The following private organizations provided written comments on the Draft EIS:

01 Pacific Malibu Development Corporation
02 John P. Foley (Attorney for private organizations and others)
03 Aquatrain, Inc.
04 Nevada Wildlife Federation, Inc.
05 Sierra Club - Toiyabe Chapter
06 Desert Bighorn Council
07 Lahontan Audubon Society, Inc.
08 National Parks & Conservation Association
09 The Wilderness Society

(01)

P
M
D

PACIFIC MALIBU DEVELOPMENT CORPORATION

December 20, 1983

Nevada State Director (NV 933)
Bureau of Land Management
300 Booth Street
P. O. Box 1200
Reno, Nevada 89520

Re: Proposed Routing of the White Pine Power Project Transmission Lines through the area of Clark County, Nevada

Gentlemen:

We protest where the above power lines are going. We are the owners of Sections 14, 15, 22 and 23. The proposed lines will run in a north/south direction along the section lines of 15 and 22. The entrance to our project is on the southwestern end of our property on Section 22.

We have been approved to build 5000 dwelling units, a major lake (ten miles of shoreline) and six hotel casino sites on our property and eight championship golf courses.

Shearson American Express our investment banker has agreed to sell and buy the $66,000,000 of industrial revenue bonds the public trust has agreed to issue. We have several major hotel chains interested in the sites (we have one lease signed by a major hotel chain) and these firms have expressed that they may not proceed forward as a result of these developments.

You must understand that our project will bring over $2 billion worth of construction to Nevada and 20,000 full time jobs to Nevada. In addition to this, this project will help change the image of the area from a place to go to gamble to a true destionation resort.

We are in a position to show other locations that will have far less impact on the community and environment.

We are sorry we did not attend your meeting but we were not informed about it.

Very truly yours,

Barry Silverton

BARRY SILVERTON

BS:bp

12021 WILSHIRE BLVD., SUITE 1900 · LOS ANGELES, CALIF. 90025 · (213) 476-2217 · 477-9595

O2

JOHN P. FOLEY
ELIZABETH J. FOLEY

LAW OFFICES
JOHN P. FOLEY
801 SOUTH RANCHO
QUAIL PARK II · SUITE A-1
LAS VEGAS, NEVADA 89106

TELEPHONE 386-5900
AREA CODE 702

January 3, 1984

Edward F. Spang
State Director
Nevada Bureau of Land Management
300 Booth Street
P.O. Box 12000
Reno, Nevada 89520

Dear Mr. Spang:

It is the opinion of the undersigned that the White Pine Power Project Draft Environmental Statement (hereafter WPPP DES) is so inadequate that meaningful analysis has been precluded. For the reasons set forth below, a revised draft should be prepared and circulated, according to 40 Code of Federal Regulations (CFR) 1502.9.

O2-1 The WPPP DES assumes that the area near and through Henderson, Nevada is a "planned or existing transmission line corridor". Please refer to the map of eastern half of the State of Nevada contained at end of WPPP DES and refer especially to the red line depicting the Intermountain Power Project Line (hereafter IPP).

As I'm certain you are aware, I represent numerous of the Plaintiffs who are challenging the IPP EIS because of substantial lack of compliance with NEPA together with FLPMA (the Federal LAND Policy and Management Act of 1976). A key issue in that lawsuit--Case No. CV-LV 83-306 HEC--centers around compliance, or lack thereof, with FLPMA §503, and implementing regulations, pertaining to designation of power transmission line corridors. In response to the IPP Plaintiffs FLPMA §503 challenges, the chief of the Division of Rights-of-Way of the Bureau of Land Management, Theodore Bingham, submitted the attached affidavit which is incorporated in these comments by this reference. I refer you to paragraph seven of that affidavit where Mr. Bingham states, under oath, that your agency has neither designated the area near Henderson, Nevada a corridor nor does BLM intend to do so. I would request that you attempt to explain this discrepancy and correct the WPPP DES accordingly. The proponent of the WPPP has stated at the Southern Nevada hearings that as many as five extra high voltage

Response to Comment O2-1: It is recognized that there is no designated right-of-way corridor, as defined in Section 503 of the Federal Land Policy and Management Act and in 43 CFR 2806.2, through the City of Henderson. The BLM Clark County Management Framework Plan delays corridor designation until completion of a statewide transportation and utility corridor study.

The WPPP Draft EIS refers to two-mile-wide study corridors in which transmission line rights-of-way will be located. These and other new transmission line rights-of-way are included in the application for the Intermountain Power Project Conditional Use Permit.

transmission lines are planned for the Henderson "corridor" despite the fact that FLPMA regulations require detailed corridorization studies prior to any corridor designation. Such FLMPA corridorization studies would require the consideration of land use planning, aesthetic damages, public health impacts, and adverse affects on adjoining landowners, all of which factors would, if adequately considered, militate against corridor designation for the Henderson area.

O2-2 The WPPP DES, since it assumes that a corridor has or will be designated through Henderson, is fatally flawed. Alternatives to the Henderson routing are not discussed in sufficient detail so that the meaningful analysis NEPA requires can take place. An alternative is briefly and vaguely alluded to as a "A third scheme" at page 2-48 of the WPPP EIS. No further mention is ever made of this alternative and the map attached to the DES fails to depict the location of this alternative. Incidentally, the map itself is inadequate, since it depicts only the eastern half of Nevada. Since the Pacific Intertie already crosses Western Nevada and an alternative route could parallel the Pacific Intertie, a map of the entire State of Nevada is essential.

O2-3 The public was not given any clear choice of alternatives for effective comment. As is evident from the Southern Nevada hearings, Henderson citizens, though clearly opposed to any routing through the Henderson area, were not presented with any alternatives to advocate. Compliance with requirements of 40 CFR 1502.14, which characterized the alternatives section as the "heart of the environmental impact statement" was not even approximated. The environmental impacts of the proposal and the alternative were not presented in comparative form. Lacking altogether was any sharp definition of the issues, which is required to provide a clear basis for choice among options by the decisionmaker and the public. I would further question compliance with 40 CFR 1502.15-16. The Henderson area is nowhere described with sufficient detail to fully appreciate the devastating effects of the proposal on Henderson. It again was extraordinarily difficult for Henderson residents to determine the proximity of the proposed route to their residences.

O2-4 Henderson is a rapidly developing area with a land use plan diametrically conflicting with additional EHV **transmission lines. The WPPP DES is further lacking in** discussion of conflicting land use plans as required by 40 CFR 1502.16 and 1506.2(d).

O2-5 An extremely disturbing omission of the WPPP DES is any discussion whatsoever of the public health impacts associated with EHV transmission fields. Numerous Henderson and Clark County residents will live in close proximity to the proposed lines and the public health implications require detailed scientific discussion. Thousands of scientific studies have been conducted on the

<u>Response to Comment O2-2</u>: Section 2.2.3.1 has been revised in the Final EIS to provide additional information on the third scheme. The three schemes discussed in Section 2.2.3.1 were developed to show electrical paths to the load centers of the California participants. Alternative routes were identified in order to determine lengths of transmission lines for electrical studies. (The routes are discussed in Section 3.2 of the WPPP Site Recommendation Report.) Based on the electrical studies, the alternative scheme that included westerly routes into California was found not to be feasible. Therefore, no corridors were defined or evaluated in detail. Maps in the Final EIS include only the preferred and alternative study corridors associated with the preferred transmission system.

<u>Response to Comment O2-3</u>: Information on impacts to the City of Henderson is included in the response to Comment L1-1 in Section 5.4.4. Figure 5-1 has been added in the Final EIS to provide additional details on the transmission line corridor in Southern Nevada.

<u>Response to Comment O2-4</u>: Information on the City of Henderson land use plans is included in Section 5.4.4 in the response to Comment L2-5.

<u>Response to Comment O2-5</u>: Information on the electrical effects of power transmission lines is included in Section 4.1.8 which has been added to the Final EIS.

physical and biological effects produced by exposure to the both non ionizing and ionizing radiation. The WPPP DES devotes no discussion whatsoever to the public health issue. It has been said that there is no issue of greater importance to be discussed in an EIS than its effects o the human health. Stated simply, the WPPP DES virtually ignores Henderson and its above summarized concerns. Many of the same NEPA defects being challenged in regard to the IPP EIS have been repeated and compounded in the WPPP DES. While the IPP EIS was prepared under the directions of Utah BLM, Nevada BLM must have been fully aware of the Henderson "corridor" problem, It appears that attempt has been made to "sweep the problem under the rug."

O2-6 Henderson city officials and all of the IPP Plaintiffs should have been consulted as part of the "early and open" scoping process required in 40 CFR 1501.7. A public hearing should have been scheduled in Henderson originally. You finally scheduled a hearing in Henderson only after litigation had been threatened.

The WPPP Draft EIS does not fulfill and satisfy to the fullest extent possible the requirements of Section 102(2)(C) of NEPA and accordingly a revised draft must be prepared. I look forward to your response. Please do not hesitate to contact me if any amplification or specific clarification of any of the foregoing is desired.

Sincerely,

Elizabeth J. Foley

Response to Comment O2-6: A statewide news release on scoping was distributed in addition to the notice published in the Federal Register on February 4, 1982 (47 FR 5362). No requests for additional scoping meetings were received. Consultation on the status of the WPPP power transmission system was a part of discussions with the City of Henderson relative to the application for Intermountain Power Project Conditional Use Permit.

A public hearing on the WPPP Draft EIS was held in Las Vegas. Most of the individuals at that hearing were from Henderson and they adequately expressed their opposition to the WPPP power transmission system. However, a subsequent hearing was held in Henderson at the request of its City Manager. Comments at this hearing were similar to comments at the Las Vegas hearing.

IN THE UNITED STATES DISTRICT COURT
for the
DISTRICT OF NEVADA

Citizens for a Better Henderson, et al.	Civ. No. CV-LV 83-8306 HEC
v.	
James G. Watt, et al.	

Affidavit of Theodore G. Bingham,
Chief, Division of Rights-of-Way
Bureau of Land Management

I, Theodore G. Bingham, state the following which is known to me by personal knowledge.

1. I am Chief of the Division of Rights-of-Way for the Bureau of Land Management (BLM). This Division is responsible, under my supervision, for the review and administration of rights-of-way over the public lands.

2. I have personally reviewed the right-of-way grant to the Intermountain Power Project (IPP) over public lands in the states of Utah, Nevada and California (copy attached).

3. The term specified in right-of-way grant authorizes IPP to start construction of the powerline only upon issuance by BLM to IPP of a Notice to Proceed. See Right-of-Way Grant, Exhibit A, 1.L.

4. The IPP right-of-way is subject to several terms and conditions which must be satisfied before a Notice to Proceed may be issued, including:

a. powerline centerline staking

b. certain clearances (e.g. archeological clearance)

c. an approved construction operational maintenance plan. See Right-of-Way Grant, Exhibit A, para. 4.A-C, and Exhibit B, para. 4A., para. 8.

5. I have been informed by Bureau field offices that IPP has not yet requested such Notice to Proceed with construction. From past experience, I estimate a minimum of 30 days from submission before the Notice can be issued, although issuance often takes as much as 6 months.

6. Therefore, compliance with the terms and conditions necessary for issuance of the Notice to Proceed has not occurred and construction does not appear imminent.

7. I have also been informed by BLM field offices that the area of federal land near Henderson, Nevada, through which the IPP power line right-of-way passes has not been designated under Section 503 of the Federal Land Policy and Management Act of 1976, 43 U.S.C. § 1763, as a right-of-way corridor, nor does BLM presently have any plans to do so.

8. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on 9/20/83 ________ ________
Signature

03

AQUATRAIN, INC.
C/O BUREAU OF RECLAMATION
ATTENTION: ERC-190
P.O. BOX 25007
DENVER, COLORADO 80225

JAN 3 1984

Mr. Edward F. Spang, State Director
Bureau of Land Management
P. O. Box 12000
Reno, Nevada 89520

Dear Mr. Spang:

Enclosed are our comments on the draft White Pine Power Project Environmental Impact Statement. Please place us on your mailing list to receive a copy of the final EIS. Thank you for the opportunity to comment.

Sincerely yours,

Ira E. McKeever

Ira E. McKeever
President, Aquatrain, Inc.

Enclosure

cc: Mr. Art Olson, Chairman
White Pine Power Project
Advisor Board
P.O. Box 630
Ely, Nevada 89301

bc: ERC-190

JEDean:rd

GENERAL COMMENTS

O3-1 A list of authorizing actions including all required permits and use authorizations, all participating "Cooperating Agencies", and which office of the affected agency is participating on behalf of the agency, and the title of the "Authorized Officer" in the affected office should be included in Chapter 2.

Response to Comment O3-1: Section 2.1.7 and Table 2-3 have been added to the Final EIS to identify the authorizing actions that may be applicable to the licensing of WPPP. The authorizing actions will depend on the site and routes granted rights-of-way by the BLM. The cooperating agencies were identified in Chapter 5 of the Draft EIS.

O3-2 The organization of Chapter 4, where impacts to each affected section of the environment are discussed under each component of the proposed action, makes a determination of the cumulative effect to any one environmental section difficult. The chapter should be reorganized or expanded to show accumulative environmental effects in a clear, concise manner.

Response to Comment O3-2: A summary of WPPP impacts is included in Table 2 of the Summary.

O3-3 A definition and discussion of the term "significant" when analyzing impacts should be included at the beginning of Chapter 4.

Response to Comment O3-3: The National Environmental Policy Act does not require that significance levels be defined. The Council on Environmental Quality Regulations for implementing the Procedural Provisions of the National Environmental Policy Act (Section 1502.16) requires discussions of direct and indirect effects and their significance. An indication of significance can be given without defining thresholds as was done for the Draft EIS.

SPECIFIC COMMENTS

P. 1-5

O3-4 The combined reserve margins decreasing to 13 percent in the year 2000 implies that new generating facilities will be required by then for system reliability. If this is the case, it should be so stated.

Response to Comment O3-4: Load growth and reliability requirements can be met by new generating facilities, purchase of power, and/or additional conservation. (It should be noted that Section 1.2.2 has been revised in the Final EIS to include the latest utility forecasts.)

P. 2-15

O3-5 The properties (BTU, percent moisture, percent ash, percent sulfur, etc.) of the composite coal should be stated.

Response to Comment O3-5: Section 2.1.4 has been revised in the Final EIS to include the properties of the composite coal.

P. 2-17

O3-6 What are the total lengths of new and upgraded rail facilities?

P. 2-56

O3-7 Was the difference in economics of slurry transport from the coal source areas to the three alternate sites considered?

P. 2-59

O3-8 Specifics as to how the Development Manager determined that rail delivery is more economically attractive than slurry pipeline delivery should be discussed. Did the coal supply and transportation study include in its analysis an average 15% increase per year through 1995 in the rates for hauling coal by rail (as predicted by the Interstate Commerce Commission)? Did annual or total system life costs of constructing and operating the rail system include this increase in rates? Did the slurry pipelines investigated include other technologies such as liquid carbon dioxide as a transportation medium?

Response to Comment O3-6: Section 2.1.4.1 and Section 2.2.5.5 have been revised in the Final EIS to include the lengths of new and upgraded rail facilities associated with the preferred and alternative railroad corridors.

Response to Comment O3-7: The selection of the preferred coal transportation system, as discussed in Section 2.2.5.3, considered the difference in economics between slurry pipeline transportation and railroad transportation.

Response to Comment O3-8: Based on the results of the WPPP Coal Source and Transportation Study, rail delivery would be more economically attractive than slurry pipeline delivery given the assumptions used in the study. This conclusion was based in part on the large capital requirements and long payback period associated with slurry pipeline transportation.

The comparison of the two modes of transportation was based on the best-estimate generation costs which included mine fuel costs, transportation costs, and combustion costs. The escalation rate used in the study for railroad transportation is considered proprietary information. However, sensitivity studies concluded that the generation costs were relatively insensitive to rail tariff uncertainties because of the relatively short length of the movements and the relatively small rail cost contribution to overall generation costs.

The analysis of slurry transportation was based on the proven technology of moving coal by water. The use of liquid carbon dioxide as a transport medium for coal has not been demonstrated to be commercially feasible on a large scale. Information on the Aquatrain Project is included in Section 5.4.4 in the response to Comment L1-2.

NEVADA WILDLIFE FEDERATION, INC.

An Affiliate of the National Wildlife Federation

820 EAST SAHARA AVENUE / LAS VEGAS, NEVADA 89104

O4

December 27, 1983

Mr. Ed Spang, State Director
U.S. Dept. of Interior
Bureau of Land Management
Federal Building, Room 3008
300 Booth St.
Reno, Nv. 89520

Dear Ed,

The Nevada Wildlife Federation has reviewed the White Pine Power Project D.E.I.S., and finds it very deficient in addressing wildlife concerns. The Federation is certainly not opposed to the project, but wildlife issues and mitigations need to be addressed. O4-1 For instance, what will the mitigations be for loss of habitat and groundwater caused by the siting of the generating plant in north Steptoe Valley?

O4-2 Several railroad corridors and transmission corridors are proposed on the insert map provided in the D.E.I.S. Nowhere in the D.E.I.S. are the relative wildlife problems of the various routes discussed or compared. No mitigations are offered. The Federation urges that these routes follow existing highways and existing power corridors as much as possible, and where not possible, the corridors use routes that avoid critical wildlife habitat.

Sincerely yours,

John A. Leitch,
President

cc: Will Molini, Director, Nev. Dept. of Wildlife

CONSERVE OUR NATURAL RESOURCES

Response to Comment O4-1: Mitigation associated with impacts to ecological resources and water resources is discussed in Section 4.1.4.6 and Section 4.1.3.3, respectively.

Response to Comment O4-2: Impacts on wildlife from transmission lines were not considered severe enough to justify a corridor-by-corridor comparison. The general impacts associated with the transmission lines were discussed in Section 4.1.4.2 of the Draft EIS. Wildlife problems associated with the railroad corridors were discussed in Section 4.1.4.4 of the Draft EIS. Corridors considered to contain relatively greater potential for wildlife impacts were identified. Mitigation recommendations were discussed in Section 4.1.4.6 of the Draft EIS.

SIERRA CLUB

Toiyabe Chapter – Nevada and Eastern California

(O5)

Jan. 2, 1984

State Director, Nevada (NV-933.2)
Bureau of Land Management
Room 3008, Federal Bldg.
300 Booth St.; PO Box 12000
Reno, NV 89520

Dear Director:

Thank you for the opportunity to review and comment upon the Draft Environmental Impact Statement for the White Pine Power Project in White Pine, Lincoln, Elko and Clark Counties, Nevada. We have confined the majority of our attention to the impacts of the project on Clark County, since that is the major concern of the Las Vegas Group.

First, we would like to say that we feel you have done a very thorough and conscientious job in preparing the DEIS. We feel that you have adequately identified the adverse environmental impacts and have devised appropriate mitigation measures. Our major concern in this area is that you indeed follow through in providing for such things as the wildlife crossing culverts.

We recognize, as does the DEIS, that there will be unavoidable impacts even after mitigation because of the irreversible environmental changes, primarily in terms of commitment of existing resources. Selected site areas would retain a certain amount of disfigurement forever upon termination of the WPPP. We realize, however, that such disturbances must be weighed against the economic and energy provisions of the WPPP.

O5-1 We would like to point out that continual withdrawal of the water resources of the state of Nevada by the WPPP and other similar projects threatens our limited water supply. Since California is going to benefit from the power generated by the Project, perhaps you should review possible re-allocation of water resources within adjacent states and communities.

We note that the majority of the proposed transmission corridors lie along already-established transmission corridors. This is a move we heartily endorse. There is an extreme visual impact from transmission lines, and they should follow corridors already

LAS VEGAS GROUP
P.O. Box 19777
Las Vegas, Nevada 89119

To explore, enjoy, and protect the natural mountain scene . . .

GREAT BASIN GROUP
P.O. Box 8096
University Station
Reno, Nevada 89507

<u>Response to Comment O5-1</u>: Under Nevada law, the State Engineer is charged with the responsibility for protection and appropriation of water within the State of Nevada. As discussed in Section 4.1.3.3, the Nevada State Engineer has granted water permits to WPPP. Testimony at the August 17, 1983 public hearing in Ely, Nevada, included unanimous support by various governmental, civic, and private concerns from White Pine County. At the conclusion of the hearing, the Nevada State Engineer based his final decision, in part, on the premise that construction and operation of WPPP would be in the vital economic interest of White Pine County. In addition, the monitoring program, which is a condition of the water permits, would permit for the early detection of any adverse effects of large groundwater withdrawals.

suffering from those impacts. Similarly, we approve the positioning of new corridors in valleys to limit their visual impacts.

Finally, we would like to urge you to continue your openness and encouragement of public participation. Such public knowledge is needed if the necessary planning to limit socioeconomic impacts is to occur. We look forward to working with you in further planning.

Sincerely,

Cheri Cinkoske
Conservation Chairperson
Las Vegas Group

(06)

DESERT BIGHORN COUNCIL

Established to promote the advancement of knowledge concerning the Desert Bighorn Sheep and the long-range welfare of these animals.

January 4, 1984

Mr. Ed Spang, Director
State of Nevada
Bureau of Land Management
P. O. Box 12000
Reno, Nevada 89520

Dear Mr. Spang:

The Technical Staff of the Desert Bighorn Council has reviewed the White Pine Power Project Draft EIS -- our concern is possible impact on bighorn sheep.

We feel strongly that transmission lines should follow existing corridors as proposed. New lines through bighorn habitat should be avoided. If new lines are constructed through bighorn habitat, we recommend towers be constructed using helicopters and that no permanent service roads be constructed through occupied habitat or habitat that might be suitable for reintroduction.

The power line construction should be coordinated with the Nevada Department of Wildlife so work can be conducted with minimal impact to the sheep.

Thank you.

Sincerely,

Richard A. Weaver
Chairman, Technical Staff

RAW:dmw

Lahontan Audubon Society, Inc.
Post Office Box 2304
Reno, Nevada 89505
(702) 329-8766

07

January 10, 1984

Edward F. Spang, State Director
Bureau of Land Management
P.O. Box 12000
Reno, Nevada 89520-0006

RE: White Pine Power Project DEIS

Dear Mr. Spang:

The Lahontan Audubon Society is composed of members from all of Nevada except Clark county. We are particularly interested in large projects such as the White Pine Power Project and its impacts. Having reviewed the DEIS, we generally support the projcet, but do have some specific concerns.

07-1 The impacts on waterfowl, other migratory birds and the wetlands ecosystems must be mitigated. The importance of wetlands need not be reviewed, for I am sure that you are well aware of their significance. Executive Order 11990 dealing with Protection of Wetlands states that federally assisted projects must "avoid to the extent possible long and short term adverse impacts associated with the destruction or modification of wetlands." Additionally, wetlands are protected by Section 404 of the Clean Water Act.

07-2 We are also concerned that there is no analysis of impacts on wilderness. The preferred site is next to the Goshute Canyon WSA, and area that is recommended for wilderness designation in the Egan Resource Management Plan. The Spring Valley site would be directly downwind from Wheeler Peak and Mt. Moriah, RARE II further study areas. The railroad and powerline alternatives will impact several wilderness study areas. We feel that this is a significant omission and some means of public review of the EIS findings should be made prior to a decision.

We feel that the Spring Valley site and all proposed developments in Spring Valley should be eliminated from further study. The visual, air qulaity and wetlands impacts of this site are such that we cannot understand how this alternative was not eliminated in the previous cuts.

Generally we question the demand for the project and doubt that it will ever be built; but we support the concept <u>if</u> it can be done so that the air, wetlands, wildlife, wilderness, recreation, cultural and other natural resources are not adversely impacted.

Sincerely,

J. H. Meierdierck

J. H. Meierdierck,
Member, Board of Directors

/js

<u>Response to Comment 07-1</u>: Section 3.1.4.5 has been added and Section 4.1.4.1 has been revised in the Final EIS to provide additional information on wetlands.

<u>Response to Comment 07-2</u>: A discussion of the impacts to wilderness is included in Section 4.1.7.8.2 which has been added to the Final EIS. Emissions from WPPP will be within Class II air quality standards which both Bureau of Land Management and U.S. Forest Service require in designated wilderness areas. It should be noted that Wheeler Peak and Mount Moriah are no longer "Rare II Further Study Areas." All roadless areas in the Humboldt National Forest are being reevaluated for suitability as wilderness.

(O8)

National Parks & Conservation Association

1701 Eighteenth Street, N.W.• Washington, D.C. 20009

(202) 265-2717

RUSSELL D. BUTCHER
Regional Representative
SOUTHWEST & CALIFORNIA
Box 67
Cottonwood, AZ 86326
(602) 634-5758

January 19, 1984

Mr. Edward F. Spang, State Director
Nevada State Office
Bureau of Land Management
P.O. Box 12000
Reno, Nevada 89520

RE: Draft EIS on WPPP

Dear Mr. Spang:

While we realize the deadline for public comments on your agency's Draft environmental impact statement slipped by earlier this month, we wish, nevertheless, to compliment your agency and others concerned regarding two aspects of the proposed 1,500 MW coal-fired White Pine Power Plant:

(1) Your agency's preference for the North Steptoe Valley Site--as opposed especially to the Spring Valley Site alternative. We are pleased with your choice because of our concern for protection of the air quality around one of Nevada's most magnificent natural scenic areas: Wheeler Peak of the South Snake Range, and its array of alpine lakes and groves of ancient Bristlecone Pines. As an indication of its nationally significant quality, Wheeler Peak and vicinity have repeatedly been suggested over the past half century as deserving of National Park status. Whether or not that goal should ever be realized, we are extremely pleased the BLM favors North Steptoe rather than Spring Valley, immediately west of Wheeler Peak, as the WPPP site.

(2) The White Pine County Air Proposal which your Draft EIS indicates is expected to result in a net gain in the region's air quality. Given the long history of noncompliance by the Kennecott Copper smelter at McGill in which no sulfur dioxide control system has ever been installed, the trade-off, while certainly not ideal, has every appearance of becoming a major practical step in the right direction. Under the circumstances, it does seem logical for WPPP to contribute money, saved through the lowering of its own sulfur dioxide emission-control level, to the cost of reducing by some 60 percent the sulfur dioxide emissions from the smelter.

O8-1 Concerning WPPP's nitrogen exides pollution, we note that your draft EIS says "Low NO_x steam generators will be used to provide staged combustion of the fuel to minimize the formation of NO_x." We realize that boiler design is the accepted approach to reducing this pollution problem in America. But did your agency also explore what is a far more effective alternative; namely, the use of catalytic reduction equipment? We believe your document should at least have discussed the merits of this alternative, and offered reasons why it is not to be used. Catalytic reduction is a demonstrated success in Japan.

Sincerely,

Russell D. Butcher
Southwest-&-California Representative

cc: Pete Ludwig,
of Rep. Barbara
Vucanovich's
Elko office
Hazel Gardella
of Sen. Paul
Laxalt's Reno
office

Response to Comment O8-1: The major concern of WPPP is to install emission control equipment that has been proven through use on commercially operating plants similar in size to WPPP units. Commercial operating experience with catalytic ammonia injection systems on utility-type coal-fueled steam generators is extremely limited. Tests on oil-fired and natural gas-fired units have occurred. The results of these tests indicate a number of potential problems such as catalyst plugging, significant ammonia slip, catalyst erosion, and catalyst activity depletion. All postcombustion systems, including catalytic ammonia injection, were rejected from consideration for WPPP due to the lack of commercial operating experience with these systems on coal-fueled (especially western coal) plants.

O9

THE WILDERNESS SOCIETY

FOUNDED IN 1935

Mr. Merrill DeSpain
District Manager
Bureau of Land Management
Ely District Office
Star Route 5, Box 1
Ely, NV 89301

January 26, 1984

Dear Mr. DeSpain,

Thank you for sending the Draft Environmental Impact Statement Summary of the White Pine Power Project.

Our most important point of concern is the choice of site for the project. We strongly urge that the Project be located at the present preferred site, or at the Butte Valley Site. The proximity of the Spring Valley Site to Wheeler Peak, and the likelyhood that a plant at that location would have a seriously deleterious affect on the air quality of Wheeler Peak, is cause enough to rule Spring Valley out as a possible plant location.

O9-1 We are also concerned over the effects of the project on the natural resource values of the site. We are particularly interested in the water and ecological resources, and in the air quality immediately around the plant. We endorse stringent mitigation and monitoring measures, and would like to know how the WPPP specifically plans to limit environmental damage.

Please continue to keep us informed of any development of the Project, or changes in plan.

Sincerely,

Patricia Hedge

Patricia Hedge
Regional Director, California-Nevada

278 POST STREET, #400, SAN FRANCISCO, CA 94108
~~(415) 982-2975~~
(415) 982-2795

Response to Comment O9-1: Mitigation and monitoring measures associated with impacts on air resources, water resources, and ecological resources are included in Section 4.1.2.5, Section 4.1.3.5, and Section 4.1.4.6, respectively, of the Final EIS. It should be noted that these measures were also included in the Draft EIS.

5.4.6 Private Individuals

The following private individuals provided written comments on the Draft EIS:

- I1 Dave Carter
- I2 Bobby W. Hooper
- I3 Petition from City of Henderson residents
- I4 Barbara P. Broussard
- I5 Gordon and Irene Foppiano
- I6 Robert W. Maichle

14 Dec. 83

(I1)

State Director Nevada (NV-933.2)
B.L.M.
Mr. Ed Spang:
Dear Mr. Spang,

I was impressed with the thoroughness of the Impact Statement.

Due to the location of my Ranch I will probably be affected more than anyone in Steptoe Valley by the chosen location of the Power Plant.

I am in the process of planting and building up of the farming and cattle capacity of the ranches. I am in favor of the project and realize I will have to fit my growth and operation in conjunction with the project. If I understand correctly my water will not be jeopardized and if so compensated accordingly.

At this time I am the only ranch in this part of the valley without Electricity. In many other remote locations there is being power lines completed at no cost to the customer yet the WP Power Co. wanted a substancial investment from myself. Maybe you could recommend to me the right party to contact in this matter. I know the community and area needs the power plant economically and would serve to the benefit to many people. Again I say I intend to cooperate in any way and expect the same Courtesy from all parties involved.

Sincerely;

Dan Carter

(I2)

December 14, 1983

State Director, Nevada (NV-933.2)
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street; Post Office Box 12000
Reno, Nevada 89520

Dear Sir:

I have studied the Draft Environmental Impact Statement of the White Pine Power Project that was made available to the public by the Battle Mountain District BLM office. I am very concerned with information available on the WPPP because I am a landowner in White Pine County. My land is located at W½, Section 35, 26E, 65N, and is immediately adjacent to the proposed water supply area for the North Steptoe Valley Site.

I1-1 My concern is that the study of the impact of the proposed water system on the surrounding agricultural lands in Steptoe Valley was not extensive enough to have arrived at a conclusion of the impact that will be felt in the years to come. Agricultural use of this land is a long-term prospect and cannot be pursued in this area if the water supply is depleted or lowered.

May I urge more extensive study and projections and information made available to landowners close to the proposed site on just what the impact will be. This information is critical for planning for the future and for current investment decisions.

Sincerely,

Bobby W. Hooper
2247 Appaloosa Rd. #1-8
Battle Mountain
Nevada 89820

Response to Comment I1-1: As discussed in Section 4.1.3.3 of the Draft EIS, the Nevada State Engineer has granted water permits to WPPP. This decision was based on groundwater studies and computer modeling of drawdown over the life of WPPP. The permits are subject to certain conditions, including the participation of WPPP in a monitoring program for the early detection of any adverse effects from groundwater withdrawals. It is the opinion of the Nevada State Engineer that the monitoring program will provide the surveillance required to satisfy the legitimate concerns of those people who had protested the WPPP applications for water permits. (It should be noted, that based on computer modeling of the area around Section 35 of T26N, R65E, the maximum drawdown should be less than five feet at this location over the 36-year operating life of WPPP.)

PETITION

(I3)

We the undersigned are opposed to the widening of the electrical transmission corridor which borders the City of Henderson.

The reasons for this opposition include (1) Such addition will make an unsightly jungle of metal power structures and totally deface the natural desert beauty of the area, (2) The power lines make a loud buzzing noise which is very annoying to anyone who lines near the area, (3) With so many power lines in close proximity, the probability of hazardous conditions is greatly increased, and (4) Property near the power lines will decrease in value and will not attract new development in the eastern part of Henderson.

For these reasons we feel an alternative route for such power lines should be found.

John T. Hall
Lois J. Hall
[illegible]
[illegible]
[illegible] Mortensen
[illegible]
Betty M. Diamond
[illegible]
[illegible]
Debbie Reynolds
Kendell McBride
Alfred Johnson
Suzanne C. Johnson
Robert L. Marvin
Winifred A. Marvin
Neal J. Magelssen
Sarah E. Magelssen

Carol Brooks
Christine Lazzaro
[illegible] Campbell
[illegible]
Bikki Reese
Robert Reese
[illegible]
[illegible] Johnston
Arthur McBride
Edna McBride
[illegible]
Sherry Hayden
[illegible]
[illegible]
[illegible]
Rene Guzenske
Bernard S. Guzenske

[illegible]
[illegible]
M. Maxwell
[illegible]
David [illegible]
Harry Talowsky
Dale P. [illegible]
Cheryl Franchou
Alice Sims
Joyce Wiles
[illegible]
Charles [illegible]
[illegible] LaPointe
[illegible] LaPointe
Robert D. Nelson
S. Lombardo
[illegible]
Jean T. Matthews
Albert F. Matthews
[illegible] McEwen
Harry W. [illegible]
Karin Bakke
[illegible]
Kathy Fagg
[illegible]
[illegible] Lawson

William [illegible]
Charlotte E. Hunt
[illegible] Springer
Becky Shisko
[illegible]
[illegible]
Betty M. Poole
Frank R. Poole
Maria Beauchamp
Nona McMurdo
[illegible] McMurdo
[illegible]
R. Samuel Dodge
Thomas Dodge
[illegible] Dodge
[illegible]

PETITION

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For these reasons we feel an alternative route for such power lines should be found.

Donna M. [illegible]
[illegible]
Elizabeth Lopez
Norma Dominguez
Marion B. Lee
Marsha Shumaker
Patricia A. [illegible]
Floyd Watson
Madalyn Watson
[illegible] Anderson
Christopher J. Masters
[illegible]
[illegible]
Terry A. Urbanke
Marie Donnelly
[illegible] B. Gibney
Edward G. [illegible]

Tina Romero
Margaret Scholl
Mary A. [illegible]
Alfred R. Bega
Mr & Mrs + Pete Sandoval
Margaret Sandoval
Pat Sandoval
Mrs John Fragoso
Henry V. Zawinski
Mary Zawinski
Corrine Smith
[illegible] Thorn
[illegible]
Rosario [illegible]
[illegible]
William [illegible]
[illegible]

Leland F. Hold
Donald W. Scott
Mae O. Scott
Kathleen A. Scott
John J. Coffelli
Eric E. Ernst
Vivian Stice
[illegible]
Mary D. [illegible]
Erminia Mercardini
Rob [illegible]
[illegible]
[illegible]
[illegible]
Rose Horenburg
[illegible] Pogorelski
Arlene Pogorelski
Josephine Jarrata
Lillian D. Slocum
Lawrence H. Weir
Antonio [illegible]
Kathleen McKinley
Lloyd H. [illegible]
Mabel A. Leonard
[illegible] Holt
Isabelle Zine

Betty Scott
Sandra Mercer
Robert F. Ott
Emma Gerard
[illegible]
Cheryl Hollander
Mark Hollander
Berch J. Astorga
[illegible]
Pauline Vincent
Frances Chavez
Terri Chavez
[illegible] Martinez
Marcella Fruth
Leonard Fruth
Casimir L. Kutkowski
Donna A. Dixon
Henrietta M. [illegible]
Rex [illegible]
Dorothy Cahill
Juanita Gallegos
Mary Gallegos
[illegible]
Max [illegible]
Carol R. Bowers
Thomas St. Clair

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George Preston	Karen Valdez
[illegible]	Luther L. [illegible]
Avis Sheehan	Harold J. Donnelly
Martha Sheehan	Sally A. Eden
Elsie Sandleen	Mr. & Mrs. Filimon Herrera
Alice Flaherty	Mr. & Mrs. Altie Fish
John Flaherty	Mr. & Mrs. Roland Herrera
Elsie M. Dreandoff	Mrs. Rosemie Villas
Harry and Sheila Dwyer	Floyd J. Villas
Adolph M. Dolezal	Lorraine A. Villas
Veronica Dalager	Paul M. Hunt
Joseph Donnelly	Alberta C. Horn
Olympia Morrissey	Joseph L. Vitek
Walter Morrissey	Virginia Servin
Marianne Romero	Anthony R. Servin
Della Inglis	Barbara G. Bagley
	M. J. Bagley

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Loren & Diana Herreid	Milton M. Brandley
S. E. Hastings	Frankie K. Manley
Mrs. Bettie Hendricks	Donna Stephens
Mari K. Bagley	[illegible] O. Rexford
George T. Boclanis	Dean Chapman
[illegible]	Louise Paxton
[illegible]	D. Belinghri
Norman R. Olose	Sidney Belinghri
Gary L. Clark	Eugene J. [illegible]
Shepherd McNeal	Lisa Crawford
Lynda Badger	Julie Norris
Jackie Morgan	K. Earl
Juline H. Bergman	Jeff Adulsen
Richard Walk	Lana Poff
Dorothy Shepherd	Ev. Murray
Kathy Lehmer	Phil D. Anderson
Terry M. Messinger	Jay Hatch

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Judy Watson	Winifred E. Fisher
Vicki Liggett	[illegible]
[illegible]	Larry [illegible]
[illegible]	[illegible]
[illegible]	Susanna Boylan
Donna Schramm	Joseph Boylan
Juanita Schramm	[illegible]
Tom Schramm	[illegible]
John Odermann	Jean John
Charles B. [illegible]	Joe John
[illegible] Hall	~~[illegible]~~
Edith L. Brennan	Emily Maloof
Yvonne Boylan	Tom Maloof
Norma McKillip	Kathy M. [illegible]
[illegible]	Blanca E. St. Clair
[illegible]	Linda Driscoll
Rita [illegible]	L.A. Ouellett

Dolores [illegible]	
Ray Villas	
Kay Bott	
[illegible]	
[illegible]	
Didie Maestro	
Robert Hall	

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Wee Salazar	[illegible] R. Stidelle
Virginia Weir	Ann Waldy
William R Nichols	Mary Martin
Irish A Nickels	Henry A. Sandor
Bertha Cope	M. Judith Bray
Walter Cope	Ilene Rawlin
Frank Hudlick	James R Martin
Fred Pakohe	[illegible]
John L Leonard Jr	Mr & Mrs M. Berntsen
LeRoy E. Wipha	~~[illegible]~~ Ralph Grady
Richard Hettrick	Bernadette Grady
Edith Hetrick	Tom Malonf
Margaret Norton	Joe Benaly
D.C. Gerard	Ethel L Wells
Lyell F Castronovo	Ann Jones
Nancy Gerlensen	Barbara A. Lewis
Bessie M. Hartman	Ted Sandoval
Mary J Ouellette	
Rachel Jaramillo	
Ted Jaramillo	

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Michael E Salgos	[illegible] Edison
Russell Radle	James Edison
[illegible] Hendrick	[illegible] Allen
Margaret Hendricks	Robert [illegible]
Deborah Bucher	Carolyn Skinner
Howard Bucher	Bud Skinner
Norman Hendrick	Joe L. Martinez
[illegible] Martinez	Pat Martinez
[illegible] Martinez	D Gallagher
Benito Pearce	Ronald Martinez
[illegible] Pearce	Tony Large
Chris C Baca	Ellen Francis
Sherrie Baca	Henry Francis
Andrea Brimbecke	Madeline Lucero
Brian Brimbecke	Sisto Lucero
Karen Martinez	Matilda Large
Raymond Martinez	Rosalie Higley

Charles T. Higley	
Roberto J. Lucero	
[illegible] Baca	
[illegible] Schoenfeld	
Dale Fawcez	
Mark Cobb	
Janet E. Cobb	
Carolyn Tonerah	
[illegible] Tonerah	
Margaret H. Montoya	
[illegible] Montoya	
Rebecca Kelley	
Dennis Kelley	

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Sally A Krueger	Ginny Maestas
[illegible]	[illegible]
Toni Michel	Richard McLeguin
[illegible]	Mary Kay [illegible]
Donnie Rincon	Annette M. Seguin
John B. Vincent	Susan E. Wise
[illegible]	Virginia E. Balbenza
Alan Wolf	[illegible]
Donna M. McCord	Carl Martinez
Mary F Sheehan	[illegible]
Daniel R. Sheehan	[illegible]
James Pamil	Paul [illegible]
Mary Wolf	Danny Herrera
John M Oatolan	[illegible]
Gloria Lipinski	Brenda Herrera
Ronald A. Lipinski	Elizabeth H Donnelly
Nancy Oatolan	[illegible]

PETITION

WE THE UNDERSIGNED CONCERNED CITIZENS ARE OPPOSED TO THE PROPOSED TRANSMISSION LINES AND TOWERS GOING THROUGH AND BORDERING THE CITY OF HENDERSON, NEVADA.

NAME	ADDRESS	CITY
[illegible]	431 Blackridge	Hend.
Peggy L Cole	311 Chaparral	Hend.
Dolly R Jonson	431 Blackridge	Henderson
[illegible]	811 W. [illegible]	[illegible]
[illegible]	770 Acres Ln	Hnd
Carter Young	735 Skyline Dr.	Hend
Andy B	Major Ave	Henderson
[illegible]	609 [illegible]	Hendm
[illegible]	281 E. CHAPARRAL	HENDERSON
Kenneth [illegible]	421 CHATEAU	HENDERSON
[illegible]	412 HORIZON DR.	HENDERSON
[illegible]	620 Blackmore	Henderson
Barbara Jeffries	2430 La Casa Dr	Henderson
Cheryl Carroll	770 Grace Lane	Henderson
Sylvia Lopez	1167 San Eduardo	Henderson
[illegible]	557 [illegible]	Henderson
[illegible] Ellis	557 [illegible]	[illegible]
Becky Portucci	1011 Hidden Valley	Henderson, NV
[illegible]	412 Horizon Dr	Henderson Nev
[illegible]	330 WATER ST.	HENDERSON, NV.
Mary Ann Nourse	354 Center St	Henderson, Nev.
Nathaniel W Mauro	354 Center	Henderson

(14)

December 15, 1983.
812 Santa Ynez Ave
Henderson, Nevada
89015

B.L.M.
3000 Booth St
Box 12000
Reno, Nevada

Re: White Pine Power Project.

Dear Sirs:

The Nevada-McCullough Line presently runs very close to our home. We purchased an acre in the area and built a very nice home on it. I believe, however, that the corridor should be moved and permanently designated outside the present City of Henderson limits. There is room to do this now. Future development of this general geographic location may then be planned in an orderly fashion and new people can plan for the visual impact of many power lines running in a corridor. The visual impact alone is disturbing to say nothing of noise and so forth.

I read, in its entirety, the IPP E.I.S. It was both interesting and informative, but an in-depth study of the Henderson area was not developed. The White Pine Power Project E.I.S. should include a detailed study.

I4-1 I object strongly to the present corridor and request that you conduct a new investigation in the Southern Las Vegas Valley area. The great beauty of the McCullough Mountains and River Mountains should not be completely spoiled. Take in to con-

I4-2 sideration the present economic development and future projects planned for the area. People who choose to live in desert areas are faced with numerous problems in order to survive. Desert-dwellers have a very proper respect for nature and want their area to remain as "natural" as possible....

Most people emphasize the monetary impact of projects such as you propose. I cannot quote a specific amount of dollar damage to property owners in this case but there is no doubt it would be a large dollar loss. The tax gains for the area would be nil in view of present difficult times, of course. There is much to be re-considered and re-thought. Thank you and I hope you will move that corridor out of Henderson. (Mrs.) Barbara P. Broussard

Response to Comment I4-1: The WPPP power transmission system in Clark County will parallel existing and/or planned transmission lines and transportation systems. The WPPP transmission lines will not traverse the McCullough Mountains or the River Mountains.

Response to Comment I4-2: Information on the Henderson land use plan is included in the response to Comment L2-5 in Section 5.4.4.

I5

Star Route 1, Box 23
Ely, Nevada 89301
December 27, 1983

Nevada State Director (NV-933)
Bureau of Land Management
300 Booth St. P.O. Box 12000
Reno, Nevada 89520

Re: White Pine Power Project

Gentlemen:

We believe the White Pine Power Project will have adverse effects on the ranchers in the area.

I5-1
1. It will lower the groundwater table.
2. This will dry-up the sub-irrigated land and effect the hay yields.
3. A.U.M's will be lost due to the land being used by the Power Project. More AU.M's will be lost when the sub-irrigated land dries up.
4. The present domestic and stock watering wells will have to be drilled deeper when the groundwater table is lowered.

I5-2
5. The increase in population, especially the transients who are unable to get work, will increase the cattle rustling and poaching. The increase in traffic, both automobile and train, will cause more cattle being hit and killed.

Sincerely,
Gordon T. Foppiano
Irene Foppiano

Response to Comment I5-1: As discussed in Section 4.1.3.3 of the Draft EIS, information from a monitoring program will be used to identify impacts due to groundwater withdrawals before they become significant in order to apply the appropriate mitigative measure. Impacts could include reduction in hay yields or need for deeper wells. The method for mitigating these impacts will be included in the agricultural industry part of the Impact Allevation Plan discussed in Section 5.4.1 in the response to Comment H5-11.

Response to Comment I5-2: Impacts due to cattle rustling, poaching, and road kills will be addressed in the agricultural industry part of the Impact Alleviation Plan discussed in Section 5.4.1 in the response to Comment H5-11.

Robert W. Maichle
5251 Rambling Road
Las Vegas, Nevada
89120
December 29, 1983

I6

Nevada State Director
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street
Post office Box 12000
Reno, Nevada 89520

(NV-933.2)

Sir;

wildlife? You want to take THEIR WATER, alter THEIR ENVIRONMENT by running power lines, roads, railroads and a water supply system, disturb THEIR PEACE with construction crews and maintenance personnel, and pollute THEIR AIR with soot, smuck and noxious gases. I read the Draft Environmental Impact Statement to see if you had adequately discussed impacts, alternatives and/or possible mitigation. I believe the DEIS fails to adequately cover impacts to the flora and fauna of the area. I6-1

I suppose that most of human population of the area regards this as financially rewarding therefore desirable. I suppose that the is a natural desire to rush this through without complications. These facts remain. Those who would benefit from the increased power generation should foot the bill for mitigation. The wildlife of the area are of concern to the residents of that area. The fauna of the area depend on the flora, therefore, impacts on vegetation also need closer examination. Who will pay for increased enforcement mentioned on 4-41. Will the Nevada Department of Wildlife be financially harmed by the demands brought about by the increased poaching mentioned on 4-30. I6-2 Where will the wild horses go and what envirionmental damage and pressure will they create while avoiding the human encroachment mentioned on 4-25. I6-3 Questions are raised on page 4-76, wildlife like cattle may be denied access to water and fences to protect cattle may hamper wildlife.

I feel that in an ENVIRIONMENTAL STATEMENT the Bureau should address wildlife and their needs. I would add badgers, cottontail rabbits, kit foxes, red and grey foxes, bobcats and mountain lions to your list of mammals in the region (table 3-3). This doesn't included the little furry creatures that eagles and hawks like. I6-4 I feel that the Eagles that have soared the hills and valleys of nevada are important. I am not a biologist but human activety is going to impact wildlife, human encroachment will pressure game species which are a recreation resource of the state and generate the funding for the Nevada Department of Wildlife to manage the non-game species which also will be impacted, and construction will use water, lower the water table and, therefore, threaten wildlife. Please list possible mitigation techniques. The impacts on vegetation, the intrusion of roads and transmission lines, the increases in human activity will impact wildlife and thus call for mitigation. I feel that this DEIS should have futher addressed the impacts on the wildlife (both game and non-game) and vegetation of the area and urge the inclusion of more mitigation measures in the Final EIS.

Sincerely yours,

Robert W Maichle

Robert W. Maichle

Response to Comment I6-1: Section 4.1.4 of the Draft EIS adequately discussed impacts on ecological resources, including flora and fauna.

Response to Comment I6-2: Costs for increased enforcement will be borne by the enforcing agencies. It should be noted that tax dollars from WPPP construction and operation will be provided to the State of Nevada for distribution to state agencies.

Response to Comment I6-3: Human encroachment would be most intense near the WPPP sites. There are no wild horses on or near the Spring Valley Site. Both the North Steptoe Valley Site and the Butte Valley Site are in recognized wild horse herd areas, but in localities with low populations. The horses would relocate to other areas with suitable habitat if human disturbances became too great. However, wild horses can coexist with human activities if not excessively disturbed.

Response to Comment I6-4: Table 3-3 in the Draft EIS is a partial list of terrestrial wildlife species in the WPPP region. Additional information is included in the Ecological Resources Baseline technical report.

CHAPTER 6

6.0 PREPARATION

The EIS for WPPP was prepared by Dames & Moore, Environmental Consultant, under a Memorandum of Understanding (MOU) between the County, Dames & Moore, and BLM. Dames & Moore was responsible for conducting environmental studies under BLM direction. The following individuals had direct responsibility for the preparation and development of the technical reports, the Draft EIS, and the Final EIS.

DAMES & MOORE

Project Management

- John H. Robinson, Partner. Project Director. Bachelor of Architecture, California State Polytechnic University at San Luis Obispo. Graduate studies in Urban Design, University of California, Los Angeles.

- Donna J. McClay, Project Manager. B.S., geology, University of Southern California.

Earth Resources

- Robert E. Troutman, Staff Geologist. Principal Investigator. B.A., geology, University of California, Santa Barbara.

Air Resources

- Douglas H. Brewer, Senior Engineer. Principal Investigator. B.S., chemical engineering, California State Polytechnic University.

- Alexander W. Bealer, Project Meteorologist. B.S., mathematics, University of Georgia. M.S., atmospheric sciences, University of California, Los Angeles.

Water Resources

- Richard L. Harlan, Senior Hydrogeologist. Principal Investigator. B.A., geology, University of Colorado. M.S., Ph.D., hydrology, Michigan State University.

Ecological Resources

- Loren R. Hettinger, Senior Ecologist. Principal Investigator - vegetation. B.S., botany, Fort Lewis College. M.S., plant ecology, New Mexico State University. Ph.D., plant ecology, University of Alberta.

- Peter Davis, Staff Wildlife Ecologist. Principal Investigator - terrestrial wildlife. B.S., M.S., biological sciences, Michigan Technological University. Ph.D., zoology, University of Wyoming.

- Robert E. Quinlan, Staff Biologist. Principal Investigator - aquatic ecology. A.S., biology, Casper College. B.S., zoology and fisheries management, University of Wyoming. M.S., zoology and aquatic biology, University of Wyoming.

- Quentin P. Bliss, Staff Biologist. B.S., fisheries, University of Nebraska. M.S., fisheries, Utah State University.

- Thomas K. Eaman, Range Scientist. Principal Investigator - soils. B.S., range management, Colorado State University. M.S., range management, Texas A&M University.

- Debrah Sherman, Range/Reclamation Scientist. B.S., zoology, Colorado State University. M.S., range ecology, Colorado State University.

Visual Resources

- Daniel D. Moreno, Project Planner. Principal Investigator. B.A., geography, California State University, Northridge. M.A., geography, University of California, Los Angeles.

Socioeconomics

- George M. Kurilko, Associate. Principal Investigator. S.B., architecture, University of Cincinnati. M.C.P., city planning, Massachusetts Institute of Technology. Ph.D., city and regional planning, Massachusetts Institute of Technology. Fulbright Fellow.

- Patricia L. Nelson, Staff Planner. B.S., conservation of natural resources, University of California, Berkeley. Certificate in urban and regional planning, University of California, Berkeley.

Graphics

- Denise De Garmo, Consultant.

- Karen Woodmansee, Consultant.

INTERMOUNTAIN RESEARCH

Cultural and Paleontological Resources

- Robert G. Elston, Director of Research. Principal Investigator - cultural resources. B.A., anthropology, San Francisco State University. M.A., anthropology, Washington State University. Ph.D., anthropology, Washington State University.

- Charles D. Zeier, Staff Archaeologist. B.A., sociology/anthropology, Montana State University. M.A., anthropology, University of Nebraska.

- James R. Firby, Research Associate. Principal Investigator - paleontology. B.A., geology, San Francisco State College. M.A., paleontology, University of California, Berkeley. Ph.D., paleontology, University of California, Berkeley.

BUREAU OF LAND MANAGEMENT REVIEW TEAM

- Edward E. Tilzey, Environmental Coordinator. Responsible for overall coordination at state office.

- George W. Cropper, Chief, Division of Resources. Responsible for overall coordination at Ely District Office.

- Mark Barber - Wildlife/Threatened and Endangered Animals.

- Bert Bresch - Socioeconomics.

- Hal Bybee - Wild horses.

- C. Wayne Howle - Wilderness.

- Dick Jewell - Water Resources.

- Duane Ketterling - Water Resources.

- Steve Kiracofe - Soils.

- Kathy Lindsey - Vegetation/Range/Threatened and Endangered Plants.

- Dave Loomis - Socioeconomics.

- Shela McFarlin - Cultural Resources/Native American Concerns/Paleontology.

- Shaaron Netherton - Recreation/Visual Resources.

- Peter Porfido - Water Resources.

- Jake Rajala - Recreation/Visual Resources/Overall review.

- Harry Rhea - Woodland Resources.

- Bill Robison - Earth Resources.

- Ron Sjogren - Lands.

SOIL CONSERVATION SERVICE

- Craig Plummer - Vegetation/Habitat Types.

LOS ANGELES DEPARTMENT OF WATER AND POWER

Technical information on need for the project, description of the project, and alternatives to the project were provided by LADWP, the Development Manager for WPPP. Ronald P. Merlo, WPPP Environmental Engineer, provided coordination between Dames & Moore and BLM in areas not covered by the MOU.

CHAPTER 7

7.0 BIBLIOGRAPHY

The following studies and reports were used in the preparation of the EIS. Most of these documents (excluding proprietary information) are available for review at the BLM Nevada State office in Reno, Nevada, the BLM Ely District Office in Ely, Nevada, the WPPP Project office in Ely Nevada, and the LADWP General Office Building in Los Angeles, California. Upon request, documents can be made available for review at the BLM Carson City District Office in Carson City, Nevada, the BLM Elko District Office in Elko, Nevada, the BLM Las Vegas District Office in Las Vegas, Nevada, or the LADWP office in Boulder City, Nevada.

PRELIMINARY STUDIES

Ecological Analysts, Inc. Constraints to Power Plant Siting in White Pine County, Nevada. December 1978.

North American Weather Consultants. An Electric Generating Plant Siting Analysis for White Pine County, Nevada. May 1979.

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AIR QUALITY STUDIES

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ENVIRONMENTAL STUDIES

Dames & Moore. Final Technical Work Plan Environmental Impact Statement Phase. April 30, 1982.

Intermountain Research. The White Pine Power Project: Cultural Resource Considerations (two volumes). September 1981.

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PRELIMINARY ENGINEERING STUDIES

Stearns-Roger Engineering Corporation. Unit Size Study. April 24, 1981.

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CHAPTER 8

8.0 ABBREVIATIONS AND GLOSSARY

ABBREVIATIONS

ac	-	alternating current
ACHP	-	Advisory Council on Historic Preservation
ACSR	-	Aluminum cable, steel-reinforced
ADT	-	Average daily traffic
afy	-	acre-feet per year
AUM	-	animal unit month
BACT	-	Best Available Control Technology
Be	-	beryllium
BIA	-	Bureau of Indian Affairs
BLM	-	Bureau of Land Management
Btu	-	British thermal unit
cfs	-	cubic feet per second
CO	-	carbon monoxide
County	-	White Pine County
CUP	-	Conditional Use Permit
CWH	-	construction worker housing
DARS	-	Doppler acoustic radar system
dc	-	direct current
DEP	-	State of Nevada, Division of Environmental Protection
DEISM	-	Demographic/Economic Impact Simulation Model
DOE	-	Department of Energy
EIS	-	Environmental Impact Statement
EPA	-	Environmental Protection Agency
ESD	-	State of Nevada, Employment Security Department

°F	-	degrees Fahrenheit
FAA	-	Federal Aviation Administration
FGD	-	flue gas desulfurization
FLPMA	-	Federal Land Policy and Management Act
G	-	gauss
gpd/ft	-	gallons per day per foot
gpm	-	gallons per minute
HAGS	-	Harry Allen Generating Station
Hg	-	mercury
Hz	-	hertz
ICC	-	Interstate Commerce Commission
IPP	-	Intermountain Power Project
Kennecott	-	Kennecott Corporation
kv	-	kilovolt
kv/m	-	kilovolts per meter
LADWP	-	Los Angeles Department of Water and Power
lb/hr	-	pounds per hour
LAER	-	Lowest Achievable Emission Rate
ma	-	milliamp
Magnitude	-	Richter magnitude
McGill smelter	-	Kennecott copper smelter in McGill, Nevada
MCR	-	maximum continuous rating
MHz	-	megahertz
MOA	-	Memorandum of Agreement
MOU	-	Memorandum of Understanding
mph	-	miles per hour
MW	-	megawatts

NAAQS	-	National Ambient Air Quality Standards
NDCNR	-	Nevada Department of Conservation and Natural Resources
NDOW	-	Nevada Department of Wildlife
NEPA	-	National Environmental Policy Act
NNRy	-	Nevada Northern Railway
NO_x	-	oxides of nitrogen
NO_2	-	nitrogen dioxide
NPC	-	Nevada Power Company
NRHP	-	National Register of Historic Places
NSPS	-	New Source Performance Standards
ORV	-	off-road vehicle
O_3	-	ozone
Pb	-	lead
PCO	-	State of Nevada, Planning Cooridinator's Office
PM	-	particulate matter
PSC	-	State of Nevada, Public Service Commission
PSD	-	Prevention of Significant Deterioration
SCS	-	Soil Conservation Service
SHPO	-	State Historic Preservation Office
SO_2	-	sulfur dioxide
SP	-	Southern Pacific Railroad
SPPC	-	Sierra Pacific Power Company
SRC	-	solvent refined coal
UP	-	Union Pacific Railroad
USFS	-	U.S. Forest Service
USFWS	-	U.S. Fish and Wildlife Service
USGS	-	U.S. Geological Survey

VRM	-	visual resource management
WPCSD	-	White Pine County School District
WPPP	-	White Pine Power Project
WSA	-	Wilderness Study Area

GLOSSARY

Active fault	-	A fault that can be shown to have experienced movement within the Holocene, or can be demonstrated to have undergone recurrent movement within the late Pleistocene.
Aeolian	-	Refers to processes associated with, or sediments deposited by, the wind.
Alkalinity	-	The relative concentrations of alkaline substances in water or soils sufficient to raise the pH value above 7.0 (alkaline).
Alluvial valley floor	-	The base of an alluvial valley, usually occupied by stream channels and wetlands.
Alluvium	-	A general term for deposits laid down by fluvial processes in relatively recent geologic time.
Archaic Period	-	The second, and longest, of four periods into which the prehistoric and archaeological record of the County is divided.
Artesian	-	Synonymous with confined. An artestian well derives its water from internal pressure of a confined water body.
Attainment Area	-	The area in which the National Ambient Air Quality Standards are being met.
Bad order track	-	Railroad track upon which rail cars are stored until fixed.
Base load	-	The minimum amount of electrical power delivered at a given point in a stated period of time.
Basins	-	Generally, the valley between mountain ranges or areas receiving drainage from surrounding areas.

Benches - Level topographic feature characteristic of valley slopes; usually a remnant of prehistoric water bodies or wind blown deposits.

Biological diversity - Numerous diverse living organisms together compiling a complex in which each organismal type has a role or occupies a niche, thereby sustaining balance throughout the biological community.

Biome - A major ecological community type, such as shrubland or grassland.

Blimo - A soil with the classification coarse-loamy, mixed mesic, Xerollic Camborthids.

Boofus - A soil with the classification clayey over loamy, montmorillonitic, (calcareous) mesic, Typic Halaquepts.

Brachiopods - A phylum of marine, shelled animals with two unequal shells or valves.

Calcareous soils - Soils containing sufficient free calcium carbonate or magnesium carbonate to effervesce carbon dioxide visibly when treated with cold 0.1 normal hydrochloric acid.

Cambrian Period - The oldest of the periods of the Paleozoic Era.

Candidate species - A species being considered for listing as threatened or endangered but, because of insufficient information about its occurrence or taxonomy, has not been declared as threatened or endangered.

Capacity Factor - The ratio of the average load on the generating unit to the capacity rating of the generating unit for the period of time considered.

Carboniferous - The period of the Paleozoic Era between the Devonian and the Permian.

Cenozoic Era	-	The latest of the four eras into which geologic time is divided.
Colluvium	-	Rock detritus and soil accumulated at the foot of a slope.
Cordillera	-	A group of mountain ranges that trend along one general direction.
Cretaceous	-	Last period of the Mesozoic era.
Crinoids	-	A type of echinoderm which attaches itself to the sea bottom.
Debris flow	-	A mass movement involving rapid flowage of coarse grained material.
Dendritic drainage	-	An arrangement of drainage or streams that, on a map or viewed from the air, resembles the branching habit of certain trees, such as oaks or maples.
Dera	-	A soil with the classification loamy-skeletal, carbonatic, mesic, Aquic Calciorthids.
Devonian Period	-	A geologic period within the Paleozoic Era. Sometimes called the age of fishes.
Distal	-	The outer portions of an alluvial fan or other sedimentary unit positioned farthest away from the source area.
Diurnal	-	Occurring during the daytime.
Dominant species	-	Species which, due to their size and/or abundance, have the most influence on a plant community or habitat.
Duffer, Flooded	-	A soil with the classification fine-silty, carbonatic, mesic, Aquic Calciorthids.
Dynamic settlement	-	Ground settlement in response to the dynamic process of seismic shaking.

Ecological sites	- An area capable of supporting a characteristic native plant community typified by an association of species different in kind or proportion, or in total production, from other ecological sites.
Ecosystem	- The complex of a community and its environment functioning as an ecological unit in nature.
Eocene	- Earliest period of the Tertiary division of the Cenozoic era.
Equis	- A soil with the classification fine, carbonatic, mesic, Typic Halaquepts.
Ethnographic	- Description of native lifestyles at time of first contact.
Evapotranspiration	- Loss of water from soil by both evaporation and by transpiration of vegetation.
Fault scarp	- A steep slope or cliff formed by movement along a fault. Most fault scarps have been modified by erosion since the initial faulting.
Fauna	- The animals or animal life of any stated latitude, region, or age.
Float	- A rock or fossil that has been separated from the parent material and transported some distance away.
Flood plain	- Nearly level land situated on either side of a channel which is subject to overflow flooding.
Flora	- The plants of any particular country, region, or period.
Fluvial	- Pertains to processes associated with, or sediments deposited by, rivers.
Fontreen	- A soil with the classification loamy-skeletal, carbonatic, frigid, Aridic Calcixerolls.

Fremont Period	-	The third of four periods into which the prehistoric archaeological record of the County is divided.
Fugitive sources	-	Those emissions which could not reasonably pass through a stack, chimney, vent or other functional equivalent opening.
Gateway	-	Location where the proposed WPPP coal transportation railroad would connect to existing railroads.
Gravity model	-	Mathematical model which depicts a spatial distribution of the population attracted to an area by a project based upon various physical factors.
Great Basin Physiographic Province	-	Part of the Rocky Mountain - Sierra Nevada intermountain area which lies west of the Colorado Plateau and extends to the Sierra Nevada Mountains.
Groundstone	-	A stone tool used by prehistoric man, shaped by grinding and abrasion rather than by chipping off pieces.
Guilmette Formation	-	A local geologic unit that dates to the Devonian Period of the Paleozoic Era. The unit contains numerous fossils.
Hardpan	-	A hard impervious layer of clay cemented by relatively insoluble materials.
Holocene	-	Pertaining to the Recent epoch and the development of man from the neolithic stage onward.
Hummock	-	A small mount or knoll.
Hydrocompaction	-	A non-seismic phenomenon whereby saturated earth materials collapse causing local subsidence.

Hyzen	-	A soil with the classification loamy-skeletal, carbonatic, frigid, Lithic Haploxerolls.
Igneous	-	One of the three basic rock types characterized by an aggregate of interlocking silicate minerals formed by the cooling and solidification of magma.
Joana Formation	-	A local geologic unit that is fossiliferous. Dates to the Mississippian Period of the Paleozoic Era.
Jurassic	-	The period of the Mesozoic era between the Triassic and Cretaceous.
Kidding areas	-	Areas traditionally used by pronghorn to give birth to young.
Lacustrine	-	Pertaining to, or produced by, a lake or lakes.
Lek	-	An assembly area where sage grouse carry on display and courtship behavior.
Linear transformation	-	Extrapolation of data based on a sample population.
Liquefaction	-	The sudden transformation of loosely consolidated sediments into a fluid mass, generally triggered by seismically-induced strong ground motion.
Load cycling	-	Changing turbine generator electrical energy output to match electrical load demand.
Lusetti	-	A soil with the classification coarse-loamy, mixed, mesic, Typic Camborthids.

Major stationary source - A stationary source of air pollutants which emits, or has the potential to emit, 100 tons per year or more of any pollutant subject to the Clean Air Act. Includes fossil fuel-fired steam-electric plants of more than 250 million Btu per hour.

Mesozoic Period - The third of four eras into which geologic time is divided.

Metamorphic - One of the three basic rock types characterized by a change in the constitution of any rock produced by heat, pressure and/or chemically active fluids after its original formation.

Metates - Stones with a concave upper surface used as the nether millstone for grinding grains.

Migeosyncline - A long, narrow downwarping in which the strata dip inward from both sides toward the axis and volcanic rocks are rare or absent.

mil - One thousandth of an inch.

mill - One tenth of a cent.

Miocene Epoch - The fourth of the five epochs into which the Tertiary geologic period is divided.

Mississippian Period - The fifth of seven periods into which the Paleozoic Era is divided.

Mud flow - Similar to a debris flow, except that at least 50 percent of the material is sand sized or finer.

Nonattainment area - Area in which National Ambient Air Quality Standards are not being met.

Non-preferred use	-	A term which is used to identify uses of water resources which are of lower priority.
Noxious weeds	-	Plant species that have the potential to cause economic loss via toxicity or mechanical injury to livestock or reduction in agricultural productivity.
Numic Period	-	An alternate name used to designate the post-Fremont prehistoric period.
Oupico	-	A soil with the classification coarse-loamy, mixed, mesic, Xerollic Durorthids.
Opacity	-	The state or quality of being opaque.
Paleozoic	-	Pertaining to an era of geological history from the proterozoic to the Mesozoic.
Paludal	-	Pertaining to a marsh.
Palustrine	-	Relating to marshes or fens.
Pediment	-	An erosional surface that lies at the foot of a receded slope.
Pennsylvanian Period	-	The site of seven periods into which the Paleozoic Era is divided.
Perennial stream	-	A stream which flows continually.
Permian Period	-	The last of the seven periods into which the Paleozoic Era is divided.
Piedmont	-	Formed at the base of mountains.
Plant community	-	A grouping of plant species that reoccur due to composition and structural similarities discreet from surrounding vegetation.
Plant production	-	The amount of plant material produced during one year of growth.

Playa	- The flat, generally vegetation-free surface of a former lake. May contain water for a short period of time after precipitation.
Pliestocene	- The earliest of the two epochs into which the Quaternary Period is divided.
Pliocene	- Pertaining to the latest period of the Tertiary division of the Cenozoic era.
Pluvial	- Due to action of rain. A period of increased rainfall and decreased evaporation.
Pogonip Group	- A local geologic unit that contains numerous marine invertebrate fossils. Dates to the Ordovician Period of the Paleozoic Era.
Post-Fremont Period	- The latest of four periods into which the prehistoric archaeological record of the County is divided.
Potentially active fault	- A fault which has moved within the late Pleistocene but cannot be demonstrated to be still active.
Power Sales Contracts	- Agreements between the WPPP owners and the WPPP participants that provide for the purchase of electrical energy.
Pre-Archaic Period	- The first of four periods into which the prehistoric archaeological record of the County is divided.
Precambrian Period	- The earliest unit of geologic history. Includes all rocks formed before the onset of the Cambrian Period.

Quaternary Period	-	The youngest of the two geologic periods into which the Cenozoic Era is divided.
Radius of Influence	-	The distance from the center of the well field to the limit of the cone of depression or drawdown cone due to groundwater withdrawal.
Raph	-	A soil with the classification fine-loamy, mixed, mesic, Typic Camborthids.
Raptor	-	A bird of prey.
Reclamation potential	-	A measure of the ease or difficulty of stabilizing the soil and revegetating a site.
Recurrence interval	-	Average time between earthquake of a certain magnitude on a particular fault.
Riepe	-	A soil with the classification fine, montmorillonitic, mesic, Haplic Nadurargids.
Rill wash	-	One of the first and smallest channels formed by runoff.
Salinity	-	The relative concentration of salts, usually sodium chloride, commonly expressed as parts per million.
Sanpete	-	A soil with the classification loamy-skeletal, carbonatic, mesic, Xerollic Calciorthids.
Sedimentary	-	One of three basic rock types formed from accumulations of sediment which may consist of rock fragments of various sizes, the remains or products of animals or plants, products of chemical action or of evaporation or mixtures of these.

Sensitive species	-	Species that may be removed from their habitat. Includes rare, threatened or endangered species, and those prone to be intolerant of disturbance.
Sheet wash	-	Laminar flow of water runoff generally on unobstructed uniform slopes.
Silurian	-	Pertaining to that period of the Paleozoic era between the Ordovician and Devonian.
Shorebirds	-	A variety of wading birds frequenting marshes, wet meadows, streamsides and shores of ponds and lakes.
Soil mapping units	-	A delineated area on a map that contains a single soil type and phase or an association of soil types and phases.
Soil permeability	-	The quality of a soil horizon that enables water or air to move through it.
Soil series	-	The basic unit of soil classification where soils are separated on the basis of similar profile characteristics and assigned a nationally approved name.
Spring Range	-	Areas used for cover and forage by migratory species from March through May.
Stimca	-	A soil with the classification fine-loamy, mixed, mesic, Typic Calciorthids.
Storage coefficient	-	The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in heads.
Subaerial	-	Formed, existing, or taking place on land.

Summer range	- A relatively higher elevational area utilized during summer by a seasonally migratory species usually providing seclusion for birthing and escape from summer temperatures.
Tectonic	- Of, pertaining to, or resulting from deformation of the earth's crust.
Terrace	- Component of river valleys and formed during times of high flow, parallel to the active channel.
Terrestrial	- Relating to land as distinct from air or water.
Tertiary	- Pertaining to the earlier principal division of the Cenozoic era.
Threatened or endangered species	- Any species which is likely to become or is in danger of extinction throughout all or a significant portion of its range.
Transmissivity	- The rate at which water is transmitted through a unit width of the aquifer under a unit hydraulic gradient.
Triassic	- Earliest period of Mesozoic era.
Trilobites	- Extinct marine arthropods that lived during the Paleozoic era.
Unclassified	- Associated with Clean Air Act, refers to the situation where insufficient information or data exists to determine if an area is attainment or nonattainment with respect to the National Ambient Air Quality Standards.
Ursine	- A soil with the classification loamy-skeletal, carbonatic, mesic, shallow, Xerolic Durorthids.

Uwell - A soil with the classification fine-loamy, mixed, mesic, Xerollic Camborthids.

Viewshed - The area that can be seen from a given point.

Virgin Branch Anasazi Period - A prehistoric archaeological period whose distribution extends into the southern portion of Nevada.

Water table - The upper surface of a saturated zone, where the body of ground water is not confined by an overlying body of groundwater.

Wetlands - Lands where saturation by water is the dominant factor determining the nature of soil development and the types of plant and animals living in the soil and on its surface; includes marshes, swamps, and bogs.

Winter range - A relatively lower elevational area utilized during winter by a seasonally migratory species and usually providing refuge from adverse winter elements and greater access to food.

Zero liquid discharge - A term associated with the Clean Water Act referring to the management of liquid wastes using methods which preclude the point discharge of the liquid wastes beyond the project boundaries.

Table 1-1

White Pine Power Project
Participation and Entitlement Share

Participant	Entitlement Share	
	Percentage	Megawatts[a]
Nevada Entities		
Boulder City	2.500	37.50
Lincoln County Power District No. 1	2.530	37.95
Mt. Wheeler Power, Inc.	3.000	45.00
Nevada Power Company	25.000	375.00
Overton Power District No. 5	2.530	37.95
Sierra Pacific Power Company	10.000	150.00
Valley Electric Association	2.440	36.60
Wells Rural Electric Company	1.000	15.00
California Municipalities		
Anaheim	3.621	54.32
Burbank	1.938	29.07
Glendale	1.836	27.54
Los Angeles	39.117	586.75
Pasadena	1.836	27.54
Riverside	2.652	39.78

[a] Based on nominal 1500 megawatt output excluding transmission system losses.

Table 1-2

Nevada Participants Annual Load Growth
Actual and Projected Peak Demand Requirements
(Megawatts)

Year	NPC	SPPC	Boulder	Lincoln	Wheeler	Overton	Valley	Wells	Total
1970	640	288	11.0	7	NA	7.0	7.5	4.0	964.5
1971	718	309	14.1	7	NA	10.5	6.8	4.2	1069.6
1972	828	349	12.5	6	NA	8.4	9.5	4.3	1217.7
1973	898	371	13.1	7	27.7	9.0	10.0	5.6	1341.4
1974	945	386	15.0	10	31.5	9.0	10.7	5.8	1413.0
1975	1007	428	14.6	12	24.0	9.7	12.2	6.4	1513.9
1976	1060	453	15.8	11	36.3	12.3	13.2	6.7	1608.3
1977	1147	494	17.1	15	42.2	11.2	15.4	7.5	1749.4
1978	1254	531	20.6	15	32.9	13.2	17.4	7.4	1891.5
1979	1315	562	22.7	16	26.5	14.0	20.4	9.3	1985.9
1980	1403	590	25.3	14	30.1	13.7	24.1	9.6	2109.8
1981	1423	645	27.2	16	34.9	15.0	26.8	11.1	2199.0
1982	1420	662	27.7	16	30.5	16.4	22.3	12.9	2207.8
1983	1493	674	28.9	16	33.1	17.1	21.9	16.5	2300.5
1984	1536	697	29.2	16	39.9	17.8	24.6	20.2	2380.7
1985	1579	724	29.5	17	48.0	18.5	25.9	23.8	2465.7
1986	1622	744	29.7	17	57.9	19.2	27.2	27.4	2544.4
1987	1665	762	30.6	17	69.8	19.8	28.6	31.0	2623.8
1988	1708	789	31.4	18	84.1	20.6	29.9	34.0	2715.0
1989	1751	824	32.2	18	101.4	21.5	31.3	37.0	2816.4
1990	1794	857	33.1	19	122.1	22.3	32.7	40.0	2920.2
1991	1837	890	33.9	20	147.2	23.2	34.0	43.0	3028.3
1992	1880	922	34.8	20	149.4	24.0	35.3	46.0	3111.5
1993	1923	954	35.6	21	151.7	25.0	36.7	49.0	3196.0
1994	1966	986	36.5	21	153.9	26.0	38.2	52.0	3280.6
1995	2009	1018	37.3	22	156.3	27.0	39.7	55.0	3364.3
1996	2052	1053	38.2	23	158.6	28.1	41.3	58.0	3452.2
1997	2095	1087	39.1	23	161.0	29.2	43.0	61.0	3538.3
1998	2138	1122	39.9	24	163.4	30.4	44.7	64.0	3626.4
1999	2181	1156	40.7	24	165.9	31.6	46.5	67.0	3712.7
2000	2224	1190	41.6	24	168.3	32.9	48.4	70.0	3799.2

Note: Actual data through 1982.
One megawatt equals one thousand kilowatts.

Table 1-3

California Participants Annual Load Growth
Actual and Projected Peak Demand Requirements
(Megawatts)

Year	LADWP	Anaheim	Burbank	Glendale	Pasadena	Riverside	Total
1970	3107	168	169	142	157	184	3927
1971	3439	173	183	168	177	219	4359
1972	3630	206	192	168	177	232	4605
1973	3679	236	187	175	174	229	4680
1974	3500	286	174	165	167	233	4525
1975	3594	305	168	168	169	229	4633
1976	3809	330	184	185	181	249	4938
1977	3778	328	180	178	175	253	4892
1978	4144	348	197	195	193	278	5355
1979	4090	396	197	190	197	297	5367
1980	4070	396	203	189	197	313	5368
1981	4364	424	220	211	212	319	5750
1982	4456	431	210	207	208	299	5811
1983	4444	434	217	208	215	308	5826
1984	4441	452	228	224	221	314	5880
1985	4505	470	235	231	228	320	5989
1986	4564	488	241	237	235	327	6092
1987	4660	505	247	245	242	333	6232
1988	4737	521	253	252	249	340	6352
1989	4820	540	259	260	257	347	6483
1990	4899	558	266	267	264	354	6608
1991	4978	577	273	275	272	361	6736
1992	5057	596	279	284	280	368	6864
1993	5140	615	286	292	289	375	6997
1994	5223	639	293	301	298	383	7137
1995	5307	652	301	310	307	391	7268
1996	5380	663	308	319	316	399	7385
1997	5452	674	316	329	325	407	7503
1998	5526	686	324	339	335	415	7625
1999	5598	697	332	349	345	423	7744
2000	5669	708	340	359	356	432	7864

Note: Actual data through 1982.
One megawatt equals one thousand kilowatts.

Table 1-4

Nevada Participants Annual Load Growth
Actual and Projected Energy Requirements
(Gigawatt-Hours)

Year	NPC	SPPC	Boulder	Lincoln	Wheeler	Overton	Valley	Wells	Total
1970	3235	1928	47	34	NA	32	39	20	5335
1971	3602	2123	52	30	NA	36	37	22	5902
1972	3925	2315	54	31	NA	37	39	24	6425
1973	4275	2516	61	33	118	43	40	28	7114
1974	4394	2591	61	58	182	47	46	30	7409
1975	4560	2800	64	66	178	47	53	32	7800
1976	4602	2900	68	54	159	47	55	35	7920
1977	4719	3130	70	71	212	51	63	37	8353
1978	5198	3217	72	81	148	54	69	37	8876
1979	5793	3509	86	80	124	59	86	43	9780
1980	5657	3618	85	81	140	60	104	49	9814
1981	6238	3939	89	85	166	67	127	58	10,769
1982	6209	4097	97	78	144	74	109	65	10,873
1983	6539	4055	100	77	158	75	110	69	11,183
1984	6728	4180	103	79	191	78	126	73	11,558
1985	6916	4351	106	80	230	81	132	77	11,973
1986	7104	4479	109	82	277	84	138	81	12,354
1987	7293	4587	112	84	334	87	145	85	12,727
1988	7481	4736	115	86	402	90	152	95	13,157
1989	7669	4905	118	90	485	94	159	105	13,625
1990	7858	5078	122	94	584	98	166	114	14,114
1991	8046	5247	125	97	704	102	173	124	14,618
1992	8234	5416	128	101	715	106	180	134	15,014
1993	8423	5579	131	103	725	110	187	144	15,402
1994	8611	5742	134	105	736	114	194	154	15,790
1995	8799	5905	137	107	747	119	202	164	16,180
1996	8988	6098	141	109	750	123	210	174	16,593
1997	9176	6283	144	111	770	128	219	184	17,015
1998	9264	6473	147	113	781	133	227	194	17,432
1999	9553	6662	150	116	793	139	236	204	17,853
2000	9741	6852	153	118	805	144	246	213	18,272

Note: Actual data through 1982.
One gigawatt-hour equals one million kilowatt-hours.

Table 1-5

California Participants Annual Load Growth
Actual and Projected Energy Requirements
(Gigawatt-Hours)

Year	LADWP	Anaheim	Burbank	Glendale	Pasadena	Riverside	Total
1970	17,049	978	850	656	750	815	21,098
1971	17,803	1009	843	684	782	896	22,017
1972	18,800	1119	857	700	790	936	23,202
1973	18,879	1210	864	729	794	961	23,437
1974	16,818	1429	745	675	730	918	21,315
1975	17,652	1512	733	693	761	906	22,257
1976	18,800	1582	747	732	793	946	23,600
1977	18,497	1647	753	746	796	959	23,398
1978	19,462	1714	820	778	833	1047	24,654
1979	19,535	1822	855	786	855	1095	24,948
1980	19,505	1828	875	774	844	1078	24,904
1981	20,695	1834	892	807	887	1125	26,240
1982	20,853	1842	855	788	877	1059	26,274
1983	21,386	1857	891	827	896	1065	26,922
1984	21,027	1912	898	847	931	1170	26,785
1985	21,156	1982	921	870	955	1210	27,094
1986	21,354	2055	944	893	978	1240	27,464
1987	21,746	2133	967	918	1003	1270	28,037
1988	22,123	2200	992	943	1028	1302	28,588
1989	22,432	2364	1016	968	1054	1334	29,168
1990	22,788	2332	1042	994	1080	1367	29,603
1991	23,161	2381	1068	1021	1107	1402	30,140
1992	23,594	2406	1094	1049	1135	1438	30,716
1993	23,950	2427	1122	1079	1163	1473	31,214
1994	24,358	2447	1150	1106	1192	1509	31,762
1995	24,778	2496	1179	1136	1222	1547	32,358
1996	25,209	2544	1208	1167	1252	1585	32,965
1997	25,511	2591	1238	1198	1284	1621	33,443
1998	25,889	2636	1269	1230	1316	1657	33,997
1999	26,250	2684	1301	1263	1349	1693	34,540
2000	26,675	2733	1334	1298	1383	1729	35,152

Note: Actual data through 1982.
One gigawatt-hour equals one million kilowatt-hours.

Table 1-6

WPPP Participants Reserve Margins With WPPP
(Megawatts)

	Nevada Entities			California Municipalities		
Year	Total Capability	Total Peak Demand	Reserve Margin	Total Capability	Total Peak Demand	Reserve Margin
1984	2918	2381	537	7928	5880	2048
1985	3039	2466	573	7592	5989	1603
1986	3103	2544	559	7870	6092	1778
1987	3158	2624	534	8429	6232	2197
1988	3162	2715	447	8491	6352	2139
1989	3337	2816	521	8513	6483	2030
1990	3457	2920	537	8471	6608	1863
1991	3575	3028	547	8866	6736	2130
1992	3693	3112	581	9133	6864	2269
1993	3740	3196	544	9149	6997	2152
1994	3868	3281	587	9060	7137	1923
1995	3917	3364	553	9079	7268	1811
1996	4047	3452	595	9094	7385	1709
1997	4101	3538	566	9134	7503	1631
1998	4173	3626	547	9215	7625	1590
1999	4281	3713	568	9120	7744	1376
2000	4391	3799	592	9170	7864	1306

Table 2-1

Microwave Repeater Station Locations
Southern Transmission System

Microwave Site	Elevation (feet)	Township	Range	Section
Kimberly Peak	9,237	17 N	63 E	26
Squaw Peak	7,921	16 N	63 E	4
Cave Mountain	10,742	15 N	66 E	18
Moorman Springs	6,500	10 N	62 E	32
Gap Mountain	6,200	5 N	62 E	8
Mount Wilson	9,269	4 N	68 E	31
Highland Peak	9,300	1 N	66 E	33
South Delamar Lake	4,800	8 S	62 E	5
Upper Arrow Canyon	3,200	15 S	64 E	9
Lower Apex	3,360±	18 S	63 E	2
Black Mountain	3,337	22 S	62 E	25
El Dorado Valley	3,000±	25 S	63 E	1

Table 2-2

White Pine Power Project
Construction and Operation Personnel

Year	1986				1987				1988				1989				1990				1991				1992					
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	Total Labor-Hours	% of Total
Boilermakers										26	120	180	260	300	330	350	350	370	370	350	340	330	325	300	230	135	20		2,038,410	15.9
Brick & Cement Masons						1	1	6	7	9	10	12	12	12	12	12	12	12	10	10	10	10	10	10	5				79,605	0.6
Carpenters						5	35	70	110	130	130	130	150	150	150	150	145	135	135	135	125	125	110	100	70	15	5	5	1,007,025	7.9
Electricians						2	5	35	80	110	150	195	270	330	375	420	440	460	480	480	470	460	450	420	360	190	60	15	2,721,795	21.3
Iron Workers		2	4	3	2	10	25	50	60	85	85	85	90	105	125	130	125	120	115	115	115	110	95	85	60	25	10		798,660	6.2
Laborers		11	28	20	14	55	90	115	130	155	175	175	180	185	195	190	185	175	175	175	160	155	150	145	120	80	40	10	1,445,505	11.3
Millrights												10	23	43	63	73	83	93	100	100	120	120	110	85	70	45	15	5	503,730	4.0
Operating Engineers		20	50	35	25	48	65	75	95	105	105	95	100	105	115	115	115	115	110	110	105	105	85	70	50	40	15		901,755	7.1
Painters											10	15	20	25	25	25	25	25	20	20	20	20	20	20	10	5	5		134,850	1.1
Pipefitters						2	5	25	45	65	160	220	275	325	370	390	410	420	430	430	445	425	400	380	330	175	35	5	2,508,645	19.6
Sheet Metal													5	10	10	10	10	10	10	10	15	20	15	10	10	5			65,250	0.5
Teamsters		3	8	5	4	7	15	12	25	42	45	45	45	45	45	45	45	50	50	50	50	50	50	50	40	30	15	10	363,660	2.8
Others							4	12	13	13	15	13	20	30	30	30	30	35	35	35	35	35	35	35	30	25	10	5	213,150	1.7
Subtotal		36	90	63	45	130	245	400	565	740	1005	1175	1450	1665	1845	1940	1980	2020	2040	2020	2010	1965	1855	1695	1370	740	220	40	12,782,040	100.0
Non-Manual		4	10	7	5	20	40	60	85	110	150	175	215	250	275	290	300	300	305	300	300	295	280	255	205	110	35	5		
Total Construction		40	100	70	50	150	285	460	650	850	1155	1350	1665	1915	2120	2230	2280	2320	2345	2320	2310	2260	2135	1950	1575	850	255	45		
Total Operation							10	10	25	25	25	25	45	65	85	105	145	185	225	265	300	330	365	400	465	530	530	530		
Overall Totals		40	100	70	50	150	295	470	675	875	1180	1375	1710	2205	1980	2335	2425	2505	2570	2585	2610	2590	2500	2350	2040	1380	785	575		

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

POWER GENERATION SYSTEM

	Authorizing Agency	Authorizing Action
1.	Bureau of Land Management	Land sale, Right-of-Way Grant, Temporary Use Permit, and Permit for Borrow Materials
2.	U.S. Fish and Wildlife Service	Threatened and endangered species clearance
3.	Federal Aviation Administration	Obstruction clearance for chimneys
4.	Environmental Protection Agency	Air Quality Permit; NPDES Permit for Storm Water Discharge; Hazardous Waste and Generator, Transporter, Treater, Storer and Disposer Requirements; limited authority on solid waste and water quality programs under Nevada Control
5.	Advisory Council on Historic Preservation	Archaeological and historical clearance
6.	Nevada Division of Environmental Protection	Air quality, water quality, solid waste and fugitive emissions -- approvals, Registration Certificates and Permits to Operate
7.	Nevada Department of Wildlife	Modification of Habitat Permit
8.	Nevada Public Service Commission	Construction Permits
9.	Nevada Department of Health	Permits for food, sanitation, water, and housing facilities
10.	Nevada Division of Historic Preservation	Archaeological and historical clearance

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

POWER GENERATION SYSTEM
(continued)

Authorizing Agency	Authorizing Action
11. Nevada Department of Occupational Health and Safety	Construction and Operation Permits for boilers and elevators, escalators, moving sidewalks, and dumbwaiters
12. Nevada State Fire Marshal	Approve building plans
13. White Pine County Commission	Approve conditional use permit
14. White Pine County Building Department	Building permits

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

POWER TRANSMISSION SYSTEM

Authorizing Agency	Authorizing Action
1. Bureau of Land Management	Right-of-Way Grant
2. U.S. Fish and Wildlife Service	Threatened and endangered species clearance
3. Bureau of Reclamation	Right-of-Way Grant for transmission corridor through Henderson
4. U.S. Army Corps of Engineers	Section 10 Permit and Section 404 Permit or exemption
5. U.S. Congress	Approval of Wilderness Study Area boundary modifications
6. U.S. President	Recommend modification of Wilderness Study Area boundaries and authorize construction of transmission lines through Wilderness Areas (not Wilderness Study Areas)
7. Federal Aviation Administration	Obstruction clearance for transmission towers
8. Nevada Division of Environmental Protection	Fugitive emissions Registration Certificate and Permit to Operate (20 acres or more)
9. Nevada Department of Transportation	Encroachment Permit
10. Nevada Department of Wildlife	Special Permit: Habitat modification
11. Nevada Public Service Commission	Construction Permit
12. Nevada Division of Historic Preservation and Archaeology	Archaeological and historical clearance

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

POWER TRANSMISSION SYSTEM
(continued)

Authorizing Agency	Authorizing Action
13. Clark County Public Works	Encroachment Permit for crossing County property and Environmental Permit for grading
14. Clark County Health District	Health Permit for Grading
15. Clark County Planning Commission	Recommend approval of Conditional Use Permit
16. Clark County Commission	Approve Conditional Use Permit
17. Clark County Building and Zoning Department	Issue Conditional Use Permit
18. Lincoln County Planning Commission	Conditional Use Permit, if required
19. White Pine County Commission	Conditional Use Permit, if required
20. City of Henderson	Conditional Use Permit, if required
21. Advisory Council of Historic Preservation	Archaeological and historical clearance

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

WATER SUPPLY SYSTEM

	Authorizing Agency	Authorizing Action
1.	Bureau of Land Management	Right-of-Way Grant
2.	U.S. Fish and Wildlife Service	Threatened and endangered species clearance
3.	U.S. Army Corps of Engineers	Section 10 Permit or exemption
4.	Nevada Division of Environmental Protection	Fugitive emissions Registration Certificate and Permit to Operate
5.	Nevada Division of Water Resources	Permit to appropriate public water, dam permit, and permit to store
6.	Nevada Division of Health	Plan approval and water supply facility inspection
7.	Nevada Division of Wildlife	Special Permit: Habitat modification
8.	Nevada Public Service Commission	Construction Permit
9.	Nevada Division of Historic Preservation and Archaeology	Archaeological and historical clearance
10.	Advisory Council on Historic Preservation	Archaeological and historical clearance

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

COAL TRANSPORTATION SYSTEM

Authorizing Agency	Authorizing Action
1. Bureau of Land Management	Right-of-Way Grant
2. U.S. Fish and Wildlife Service	Threatened and endangered species clearance
3. Advisory Council on Historic Preservation	Archaeological and historical clearance
4. Interstate Commerce Commission	Certificate of Public Convenience and Necessity
5. Nevada Division of Environmental Protection	Fugitive emissions Registration Certificate and Permit to Operate (20 acres or more)
6. Nevada Department of Wildlife	Special Permit: Habitat modification
7. Nevada Public Service Commission	Approve construction, elimination, alteration, or changes to railroad
8. Nevada Division of Historic Preservation and Archaeology	Archaeological and historical clearance
9. Elko County Engineer	Grading permit and plan approval
10. Lincoln County Planning Commission	Conditional Use Permit if located on county property

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

HIGHWAYS AND ACCESS ROADS

	Authorizing Agency	Authorizing Action
1.	Bureau of Land Management	Right-of-Way Grant, approval to relocate county road
2.	U.S. Fish and Wildlife Service	Threatened and endangered species clearance
3.	Advisory Council on Historic Preservation	Archaeological and historical clearance
4.	U.S. Forest Service	Right-of-Way Grant
5.	Nevada Division of Environmental Protection	Fugitive emissions Registration Certificate and Permit to Operate (20 acres or more)
6.	Nevada Department of Transportation	Occupancy permit, approval and design of highway relocation
7.	Nevada Department of Wildlife	Special Permit: Habitat modification
8.	Nevada Division of Historical Preservation and Archaeology	Archaeological and historical
9.	Clark County Health District	Health Permit for grading
10.	White Pine County Commission	Approve County road relocation and consent to state highway relocation
11.	Lincoln County	Encroachment agreement, if necessary

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

MICROWAVE SYSTEM

	Authorizing Agency	Authorizing Action
1.	Bureau of Land Management	Right-of-Way Grant
2.	U.S. Fish and Wildlife Service	Threatened and endangered species clearance
3.	Advisory Council on Historic Preservation	Archaelogical and historical clearance
4.	U.S. Forest Service	Right-of-Way Grant
5.	Federal Communication Commission	Permits to construct and operate
6.	Nevada Department of Wildlife	Special Permit: Habitat modification
7.	Nevada Public Service Commission	Construction Permits
8.	Nevada Division of Historic Preservation and Archaeology	Archaeological and historical clearance
9.	Clark County Health District	Health Permit for grading

Table 2-3

White Pine Power Project
Authorizing Agencies and Authorizing Actions

AIRCRAFT LANDING AREA

	Authorizing Agency	Authorizing Action
1.	Bureau of Land Management	Right-of-Way Grant
2.	Federal Aviation Administration	Approve plans
3.	Nevada Division of Environmental Protection	Fugitive emission Registration Certificate and Permit to Operate (20 acres or more)
4.	Advisory Council on Historic Preservation	Archaeological and historical clearance
5.	Nevada Division of Historic Preservation	Archaeological and historical clearance
6.	Nevada Department of Wildlife	Special Permit: Habitat modification
7.	U.S. Fish and Wildlife Service	Threatened and endangered species clearance

Table 2-4

WPPP Participants Reserve Margins Without WPPP
(Megawatts)

	Nevada Entities			California Municipalities		
Year	Total Capability	Total Peak Demand	Reserve Margin	Total Capability	Total Peak Demand	Reserve Margin
1992	3192	3112	80	8396	6864	1532
1993	3239	3196	43	8412	6997	1415
1994	3367	3281	86	8323	7137	1186
1995	3416	3364	52	8342	7268	1074
1996	3546	3452	94	8357	7385	972
1997	3600	3538	62	8397	7503	894
1998	3672	3626	46	8478	7625	853
1999	3724	3713	11	8383	7744	639
2000	3778	3799	(21)	8433	7864	569

Table 3-1

Major Historic Earthquakes
Great Basin and Vicinity

Date		Magnitude	Area	Maximum Displacement[b] (feet)	Length of Surface Rupture[b] (miles)
-	1847	-	West-central Utah	Unknown	Unknown
December 28,	1869	6.7[a]	Olinghouse, NV	12	14
March 26,	1872	8.0[a]	Owens Valley, CA	21	68
December 5,	1887	5.7[a]	Kanab, UT	Unknown	Unknown
November 17,	1902	6.3[a]	Pine Valley, UT	Unknown	Unknown
Autumn	1903	-	Wonder, NV	1	12
October 2,	1915	7.6	Pleasant Valley, NV	18	36
December 21,	1932	7.2	Cedar Mountain, NV	3	38
January 30,	1934	6.3	Excelsior Mountain, NV	0.3	>1
March 12,	1934	6.6	Hansel Valley, UT	1.6	3.3
December 14,	1950	5.6	Fort Sage Mts., CA	2	5
July 6,	1954	6.8	Rainbow Mountain, NV	1	20
August 24,	1954	6.8	Fallon-Stillwater, NV	2.6	19
December 16,	1954	7.2	Fairview Peak, NV	18	55
December 16,	1954	7.1	Dixie Valley, NV	10	38
March 23,	1959	6.3	Dixie Valley, NV	0	0
July 21,	1959	5.7	Kanab, UT	0	0
August 16,	1966	6.1	Clover Mountain, NV	0	0
May 25-27,	1980	6.0	Mammoth Lakes, CA	Cracking	10

a Estimated Magnitude for earthquakes occurring before establishment of seismograph networks.

b Surface ruptures and surface displacement, which may have been associated with pre-instrumental earthquakes but not reported, are listed as "Unknown". Recent earthquakes which apparently had no surface expression are listed as "0".

Table 3-2

Partial List of Plant Species in the WPPP Region

Family and Common Name	Scientific Name
Pinaceae	
Bristlecone pine	*Pinus aristata*
Douglas fir	*Pseudotsuga menziesii*
Engelmann spruce	*Picea engelmannii*
Limber pine	*Pinus flexilis*
Ponderosa pine	*Pinus ponderosa*
Singleleaf pinyon	*Pinus monophylla*
White bark pine	*Pinus albicaulis*
White fir	*Abies concolor*
Cupressaceae	
Rocky mountain juniper	*Juniperus scopulorum*
Swamp cedar	*Juniperus scopulorum* var.
Utah juniper	*Juniperus osteosperma*
Typhacase	
Cattail	*Typha* spp.
Gramineae (Poaceae)	
Alkali muhly	*Muhlenbergia asperifolia*
Alkali cordgrass	*Spartina gracilis*
Alkali sacaton	*Sporobolus airoides*
Basin wildrye	*Elymus cinereus*
Bottlebrush squirreltail	*Sitanion hystrix*
Cheatgrass brome	*Bromus tectorum*
Indian ricegrass	*Oryzopsis hymenoides*
Inland saltgrass	*Distichlis spicata*
Needle-and-thread	*Stipa comata*
Russian wildrye	*Elymus junceus*
Sandberg bluegrass	*Poa sandbergii*
Western wheatgrass	*Agropyron smithii*
Crested wheatgrass	*Agropyron desertorum*
Siberian wheatgrass	*Agropyron sibericum*
Juncaceae	
Rushes	*Juncus* spp.
Liliaceae	
Joshua tree	*Yucca brevifolia*
Salicaceae	
Aspen	*Populus tremuloides*
Chenopodiaceae	
Black greasewood	*Sarcobatus vermiculatus*
Fourwing saltbush	*Atriplex canescens*
Gardner saltbush	*Atriplex gardneri*
Gray molly	*Kochia americana*
Halogeton	*Halogeton glomeratus*
Shadscale	*Atriplex confertifolia*
Spiny hopsage	*Grayia spinosa*
Winterfat	*Ceratoides lanata*

Table 3-2

Partial List of Plant Species in the WPPP Region

Cruciferae (Brassicaceae)	
Claspingleaf pepperweed	Lepidium perfoliatum
Pinnate tansy mustard	Descurainia pinnata
Thelypody	Thelypodium sagittatum
Wallflower	Erysimum spp.
Rosaceae	
Blackbrush	Coleogyne ramosissima
Leguminosae (Fabiaceae)	
Milkvetch	Astragalus spp.
Range ratany	Krameria parvifolia
Zygophyllaceae	
Creosote bush	Larrea divaricata
Malvaceae	
Gooseberryleaf mallow	Sphaeralcea grossulariaefolia
Cactaceae	
Prickly pear	Opuntia spp.
Solanaceae	
Wolfberry	Lycium spp.
Compositae (Asteraceae)	
Basin big sagebrush	Artemisia tridentata tridentata
Big sagebrush	Artemisia tridentata
Black sagebrush	Artemisia nova
Brittlebush (Encelia)	Encelia spp.
Bud sagebrush	Artemisia spinescens
Green rabbitbrush	Chrysothamnus greenei
Littleleaf horsebrush	Tetradymia glabrata
Low rabbitbrush	Chrysothamnus viscidiflorus
Low sagebrush	Artemisia arbuscula
Rubber rabbitbrush	Chrysothamnus nauseosus
Wyoming big sagebrush	Artemisia tridentata wyomingensis
Bursage	Ambrosia (franseria) spp.

Table 3-3

Partial List of Terrestrial Wildlife Species in the WPPP Region

Common Name	Scientific Name	Habitat Preference[a]	Season of Use[b]
Birds			
Eared grebe	*Podiceps nigricollis*	W	S, B
Snowy egret	*Egretta thula*	W	S, B
White-faced ibis	*Plegadis chihi*	W	S, B
Mallard	*Anas platyrhynchos*	W	R, B
Cinnamon teal	*Anas cyanoptera*	W	C, B
Cooper's hawk	*Accipiter cooperii*	PJ, C	S, B
Ferruginous hawk	*Buteo regalis*	S, PJ	S, B
Red-tailed hawk	*Buteo jamaicensis*	S, PJ	R, B
Goshawk	*Accipter gentilis*		
Golden eagle	*Aquila chrysaetos*	S	R, B
Bald eagle	*Haliaeetus leucocephalus*	S, W	W, M
Swainson's hawk	*Buteo swainsoni*	S	S, B
American kestrel	*Falco sparverius*	S, PJ	S, B
Sage grouse	*Centrocercus urophasianus*	S	R, B
Sandhill crane	*Grus canadensis*	W, S	S, B
Long-billed curlew	*Numenius americanus*	W	S, B
American avocet	*Recurvirostra americana*	W	S, B
Horned lark	*Eremophila alpestris*	S	R, B
Scrub jay	*Aphelocoma coerulescens*	PJ	R, B
Stellar's jay	*Cyanocitta stelleri*	PJ	S
Sage thrasher	*Oreoscoptes montanus*	S	S, B
Mountain bluebird	*Sialia currucoides*	PJ, C	R, B
Loggerhead shrike	*Lanius ludovicianus*	S	R, B
Pine siskin	*Carduelis pinus*	C, PJ	S, B
Vesper sparrow	*Pooecetes gramineus*	S	S, B
Gray-headed junco	*Junco caniceps*	C	R, B
Brewer's sparrow	*Spizella breweri*	S	S, B
Sage sparrow	*Amphispiza belli*	S	S, B
Prairie falcon	*Falco mexicanus*		
Peregrine falcon	*Falco peregrinus*		
Mammals			
Spotted bat	*Euderma maculata*	S	
Muskrat	*Ondatra zibethica*	W	
Black-tailed jackrabbit	*Lepus californicus*	S	
Elk	*Cervus elaphus*	PJ, C	
Mule deer	*Odocoileus hemionus*	S, PJ, C	
Pronghorn	*Antilocapra americana*	S	
Bighorn sheep	*Ovis canadensis*	PJ	
Wild horse	*Equus caballus*	S	
Reptiles			
Desert tortoise	*Gopherus agassizi*		
Western rattlesnake	*Crotalus viridis*		
Western fence lizard	*Sceloporus occidentalis*		
Amphibians			
Leopard frog	*Rana pipiens*		

[a] Habitat Preference Key

S - Shrub-steppe
PJ - Pinyon-juniper
C - Coniferous Forest
W - Wetland

[b] Season of Use Key

R - Resident
S - Summer
W - Winter
M - Migrant
B - Breeds in area

Table 3-4

Partial List of Aquatic Species in the WPPP Region

Common Name	Scientific Name
Bonneville (Utah) cutthroat trout	*Salmo clarki utah*
Cutthroat trout	*Salmo clarki*
Rainbow trout	*Salmo gairdneri*
Brown trout	*Salmo trutta*
Brook trout	*Salvelinus fontinalis*
Independence Valley tui chub	*Gila bicolor isolata*
Northern pike	*Esox lucius*
White River spinedace	*Lepidomeda albivallis*
Big Springs spinedace	*Lepidomeda mollispinis pratensis*
Clover Valley speckled dace	*Rhinichthys osculus oligoporus*
Independence Valley speckled dace	*Rhinichthys osculus lethoporus*
Meadow Valley Wash speckled dace	*Rhinichthys osculus* ssp
White River speckled dace	*Rhinichthys osculus velifer*
Relict dace	*Relictus solitarius*
White River desert sucker	*Catostomus clarki intermedius*
White River springfish	*Crenichthys baileyi baileyi*
Preston White River springfish	*Crenichthys baileyi albivallis*
Pahrump killifish	*Empetrichthys latos*
Newark Valley tui chub	*Gila bicolor newarkensis*

Table 3-5

Threatened and Endangered Species in the WPPP Region (Listed, Proposed, and Candidate)

Plant Species	Scientific Name
Nye milk-vetch	*A. nyensis*
Monte Neva paintbrush	*Castilleja salsuginosa*
Draba	*Draba sphaeroides* var. *cusickii*
Darrow buckwheat	*Eriogonum darrovii*
Sunnyside green gentian	*Frasera gypsicola*
Four-o-clock	*Mirabilus pudica*
Bicolored penstemon	*Penstemon bicolor* ssp. *bicolor*
Bicolored penstemon	*P. bicolor* ssp. *roseus*
Thelypody	*Thelypodium laxiflorum*
Terrestrial Wildlife	
Desert tortoise	*Gopherus [Scaptochelys] agassizi*
Ferruginous hawk	*Buteo regalis*
Spotted bat	*Euderma maculatum*
White-faced ibis	*Plegadis chihi*
Swainson's hawk	*Buteo swainsoni*
Long-billed curlew	*Numenius americanus*
Peregrine falcon[a]	*Falco peregrinus*
Bald eagle[a]	*Haliaeetus leucocephalus*
Aquatic Species	
White River spinedace	*Lepidomeda albivallis*
Big Springs spinedace	*Lepidomeda mollispinis pratensis*
Relict Dace	*Relictus solitarius*
Bonneville (Utah) cutthroat trout	*Salmo clarki utah*
Clover Valley speckled dace	*Rhinichthys osculus oligoporus*
Independence Valley speckled dace	*Rhinichthys osculus lethosporus*
Independence Valley tui chub	*Gila bicolor isolata*
White River speckled dace	*Rhinichthys osculus velifer*
Preston White River springfish	*Crenichthys baileyi albivallis*
White River desert sucker	*Catostomus clarki intermedius*
Meadow Valley Wash speckled dace	*Rhinichthys osculus* spp.
Newark Valley tui chub	*Gila bicolor newarkensis*
Pahrump killifish[a]	*Empetrichthys latos*
White River springfish	*Crenichthys baileyi baileyi*

[a] Listed species.

Table 3-6

Population Changes (1940-1982)
White Pine County and the State of Nevada

							Percent Change		
	1940	1950	1960	1970	1980	1982[a]	60-70	70-80	80-82
City of Ely[b]	4140	3558	5814	6168	4882	5063	+6	-21	+4
Town of McGill	NA	2297	2195	2164	1419	1472	-1	-34	+4
Town of Ruth	NA	1244	NA	731	456	473	NA	-38	+4
County Balance	NA	2325	1799	1087	1410	1462	-40	+30	+4
White Pine County	12,377	9424	9808	10,150	8167	8470	+4	-20	+4
State of Nevada	110,247	160,083	285,278	488,738	800,493	886,543[bc]	+71	+64	+11

a Data from Regional Planning Commission, 1983, as derived from utility hook-ups.

b For years 1940 through 1970, data includes the population of East Ely which was annexed by the City of Ely in 1976.

c Data from Bureau of Business and Economic Research, University of Nevada, Reno, 1983.

NA: Not Available.

Sources (unless noted): U.S. Department of Commerce, Bureau of the Census, 1940, 1950, 1960, 1970 and 1980.

Table 3-7

Demographic Characteristics (1970-1980)
White Pine County and the State of Nevada

	White Pine County		Nevada
	1970	1980	1980
Total Population	10,150	8167	800,493
Sex Distribution (percent)			
Males	50.5	50.4	50.0
Females	49.5	49.6	50.0
Age Distribution (percent)			
19 and under	41.2	36.0	34.0
20 to 39	25.6	28.0	35.0
40 to 59	21.5	21.0	19.0
60 and over	11.7	15.0	12.0
Race/Distribution (percent)			
White	97.3	93.3	87.4
Black	0.09	0.14	6.4
Native American	1.9	2.8	1.6
Other	0.7	3.8	4.5
Average Persons per Household	3.25	2.72	2.63
Educational Attainment of Persons 25 years and older (percent)			
Less than 5 years	2.0	NA	2.0
High school graduate	55.0	NA	65.0
Four or more years of college	7.0	NA	11.0

Source: State of Nevada, Office of Community Services, 1982.

Table 3-8

Population Projections (1980-2000)
White Pine County

Source	1980	1985	1990	1995	2000	1980-2000 Change(%)
PCO[a]	8167	8237	8291	8345	8410	+3
PCO[b]	8167	8660	9285	9757	10,210	+25
PCO[c]	8167	9870	10,730	10,820	11,270	+40

a Projections using cohort-survival model.

b Projections assume no M-X basing.

c Projections assume M-X basing.

Sources: Nevada State Planning Coordinator's Office (PCO), 1979.

Table 3-9

Labor Force and Unemployment (1970-1982)
White Pine County and the State of Nevada

White Pine County	1970	1976	1980	1981	1982	1983
Total Labor Force	4170	4040	3890[a]	4320	4200	4370
Unemployment Rate (percent)	6.0	23.5	6.0	6.7	14.5	18.0
Total Employment	3910	3090	3610[b]	4090	3590	3580
State of Nevada						
Total Labor Force	218,000	304,000	381,300	464,000	483,000	487,000
Unemployment Rate (percent)	6.0	9.0	7.0	7.1	10.1	9.8
Total Employment	205,100	276,900	354,400	431,000	434,000	439,000

Note: Unemployment rate figures may not correspond to labor force and employment figures because unemployment rates are calculated based on unrounded figures.

[a] 1980 labor force figures represent actual 1980 census count. 1976-1979 and 1982 figures are estimates prepared by Nevada State Employment Security Department.

[b] Number of employed White Pine County residents. (Note: Numbers are not directly comparable to place-of-work figures.)

Source: Nevada Employment Security Department, 1983, 1984.

Table 3-10

Housing Characteristics (1970-1980)
White Pine County and the State of Nevada

Area	Total Units		One Unit Structures		Multiple Units		Mobile Homes	
	1970	1980	1970	1980	1970	1980	1970	1980
White Pine County	3289	3566	2545	2790	345	435	399	341
Nevada	171,635	377,491	103,149	208,821	47,989	92,347	20,520	42,513

Source: U.S. Department of Commerce, Bureau of the Census, 1970 and 1980.

Table 3-11

General Community Information
White Pine County

	Ely	Ruth	McGill	Lund	Baker	Cherry Creek
A. Education						
1. Public Facilities: Capacity/enrollment						
a. Spec. Ed.	NA/140	-	-	-	-	-
b. Kndg/Elem	800/550	400/75	300/180	90/50	45/20	45/0
c. Secondary	1000/725	-	200/0	50/35	-	-
2. Private Facilities: Capacity/enrollment Total (Elementary)	NA/170	-	-	-	-	-
B. Health						
1. Hospital		Residents travel to Ely for medical care				
o Type: (43 short stay bed)						
o No. beds: (98 long-term bed)						
o Avg. utilization rate: (short stay 27%; long-term 92%) (std. is one doctor/2000 people)						
2. Health Labor:						
o Total Physicians	5	-	-	-	-	-
o Total Dentists	3	-	-	-	-	-
o Total Nurses	47	-	-	-	-	-
o Total Pharmacists	7	-	-	-	-	-
o Others - (Chiropractors, physical therapists, emergency medical technicians)	137	-	-	-	-	-
3. Ambulance Services: Total vehicles	6	-	-	-	-	-
C. Social Support Systems						
1. Child Care Programs/Slots	1/30	-	-	-	-	-
2. Pre-school Programs/Slots	6/70	-	-	-	-	-
D. Safety						
1. Resident police protection/ no. of officers (std. = 1/500)	Yes/22	-	-	Yes/1	Yes/1	-
2. Fire protection: Permanent (P)/ Volunteer (V)	P(6) V(39)	V	V	V	V	-

Table 3-12

1980 Traffic Volumes and Capacities
White Pine County

Roadway	1980 ADT[a]	Capacity	1980 ADT as a percent of capacity
Alt. U.S. 50 and U.S. 93, east of 7th St. in E. Ely	9730	13,000	75
U.S. 6 - Mill St. - in Ely south of U.S. 50 - Aultman St.	2660	10,750	25
U.S. 50, west of Ruth Hwy, in White Pine County	565	13,000	4
U.S. 50 and U.S. 93 between Ely and McGill	2250	13,000	17
U.S. 93 south of Lages	620	13,000	5
U.S. 93, Pioche Hwy, south of U.S. 50	440	13,000	3
U.S. 50, west of Ely to Ruth turnoff	1430	13,000	11
U.S. 50, Aultman Ave. west of Nevada Ave.	9745	13,000	75
U.S. 6, 50, and 93 in E. Ely south of F Avenue	4410	13,000	34
Cherry Creek Road west of U.S. 93	65	NA	-
Majors junction, U.S. 50 and U.S. 93 going east on U.S. 6, 50	515	NA	-
Majors - north on U.S. 93	875	NA	-
Majors - south on U.S. 93	440	NA	-

[a] Average daily traffic.

NA: Not available.

Source: Nevada Department of Transportation, 1982.

Table 3-13

Water and Sewer Characteristics
White Pine County

	Ely	Ruth	McGill	Lund	Baker	Cherry Creek
A. Water						
1. Jurisdiction	Municipal	Private	Private	Independent Wells	Independent Wells	Independent Wells
2. Pumping capacity	1800 gpm	100-300 gpm	-	-	-	-
3. Storage capacity (std.=300 gal. storage per capita)	6.05 mg	300,000 gal	600,000 gal	-	-	-
4. Source	Murry Springs North St. well East Ely well	Ward Mts. springs	Duck Creek, McGill well	-	-	-
5. Yield	4,700 gpm-present 14,476 ac.ft./yr.max. water rights	-	-	-	-	-
6. Per capita usage	400 gal/day	-	-	-	-	-
B. Sewer						
1. Jurisdiction	Municipal	(Private) Ruth/McGill Water	Private	-	-	-
2. Treatment/ Disposal method	aeration basin w/oxidation ponds (secondary)	oxidation ponds	oxidation ponds	septic tanks	septic tanks, cesspools or underground disposal	septic tanks, cesspools or underground disposal
3. Present rate/ Capacity	1.1 mgd/1.8 mg avg daily flow	-	-	-	-	-
4. Customers	2000	160	540	-	-	-
5. Population peak capacity	11000	-	-	-	-	-

Table 3-14

Wilderness Study Areas in the WPPP Region

	Designation	County
NV-010-027	Bluebell	Elko
NV-010-033	Goshute Peak	Elko
NV-010-035	South Pequop	Elko
NV-040-015	Goshute Canyon	White Pine
NV-040-166	Riordan's Well	Nye
NV-040-168	South Egan Range	White Pine/Lincoln/Nye
NV-040-169	Mount Grafton	White Pine/Lincoln/Nye
NV-040-172	Far South Egan Range	Nye/Lincoln
NV-040-177	Fortification Range	Lincoln
NV-040-197	Table Mountain	Lincoln
NV-040-202	White Rock Range	Lincoln
NV-040-206	Parsnip Peak	Lincoln
NV-040-242	Worthington Mountain	Lincoln
NV-040-246	Weepah Spring	Nye/Lincoln
NV-050-0139	Clover Mountains	Lincoln
NV-050-0156	Meadow Valley Mountains	Lincoln/Clark
NV-050-0161	Mormon Mountains	Lincoln/Clark
NV-050-0177	Delamar Mountains	Lincoln
NV-050-0215	Arrow Canyon Range	Clark
NV-050-0229	Muddy Mountains	Clark
NV-050-0412	LaMadre Mountains	Clark
NV-050-0414	Pine Creek	Clark
NV-050-0425	North McCullough Range	Clark
NV-050-0435	South McCullough Range	Clark

Table 3-15

Land Management and Ownership Patterns
White Pine County

	Area (square miles)	Area (percent)
Public: Federal	8596	96.5
U.S. Bureau of Land Management	(6821)	(76.6)
U.S. Forest Service	(1648)	(18.5)
Reservations	(114)	(1.3)
National Wildlife Refuge	(13)	(0.15)
Public: State	3	0.05
Private	306	3.4
TOTAL	8905	100

Table 3-16

General Fund Revenue (1983-84)
White Pine County
(percent of total budget)[a]

	City of Ely	White Pine County	White Pine County School District
Property Tax	5.6	11.2	12.0
Local School Support Tax	0	0	14.7
Motor Vehicle Privilege Tax	0	0	2.7
Student Tuition	0	0	0.2
Other Local Revenues	0	0	0.1
Distributive School Fund	0	0	67.7
Other State Funds	0	0	0.8
City/County Relief Tax (CCRT)	13.1	3.9	0
Supplemental CCRT	22.2	14.2	0
Proceeds of Mines	0	2.5	0
Licenses, Permits, and Fees	12.3	6.3	0
Intergovernmental Tax Revenues	31.1	28.5	0
Transfers from other Local Governments	0	14.5	0
State Grants	0	0.6	0
Federal Grants and Revenue Sharing	2.4	4.4	1.7
Charges for Services	3.3	2.2	0
Fines and Forfeits	5.6	1.9	0
Miscellaneous Revenues	1.8	3.7	0.1
Other Financing Sources	2.4	6.3	0
Total Revenues	$1,046,007	$2,382,086	$4,704,110

[a] Percentages may not add to 100 due to rounding. City of Ely figures are projected as of April 30, 1984, and White Pine County and School District figures are budgeted figures prior to fiscal year.

Table 3-17

Soils and Ecological Sites
WPPP Generating Station Sites

Mapping Unit	Soil Series	SCS Ecological Site Number	Ecological Site	Precipitation Zone	Range in Production Pounds/Acre Air Dry: Potential	Range in Production Pounds/Acre Air Dry: Median[a]
1500	Blimo	028B010N	Loamy	8-10	400-800	600
1480	Boofus	028B020N	Sodic Flat	5-12	200-600	450
1080	Dera	028B017N	Loamy	5-8	250-700	450
1480	Duffer, Flooded	028B002N	Saline Meadow	5-12	750-3000	1500
1480	Equis	028B004N	Saline Bottom	5-12	500-2000	1000
2110	Fontreen	028B060N	Shallow Loamy Slope	12-16	100-600	300
2110	Hyzen	028B060N	Shallow Loamy Slope	12-16	100-600	300
2180	Lusetti	028B013N	Silty	8-10	300-800	550
1042	Oupico	028B010N	Loamy	8-10	400-800	600
1500	Raph	028B017N	Loamy	5-8	250-700	450
1840	Riepe	024X003N	Sodic Terrace	6-8	300-600	450
1040	Sanpete	028B010N	Loamy	8-10	400-800	600
1840	Stimca	024X022N	Sodic Terrace	8-10	350-800	600
2140	Ursine	028B011N	Shallow Calcareous Loam	8-12	400-950	700
1011	UN-one	024X022N	Sodic Terrace	8-10	350-800	600
1500	Uwell	028B010N	Loamy	8-10	400-800	600
2261	UN-three	028B004N	Saline Bottom	5-12	500-2000	1000

[a] Soil Conservation Service median values were used when available, otherwise, high and low values were averaged.

Table 3-18

Land Productivity

Ecological Site	Stocking Rate[a] (acres/AUM)	Butte Valley Site		North Steptoe Valley Site		Spring Valley Site	
		Acres	AUMs	Acres	AUMs	Acres	AUMs
Loamy 8-10	16	860	54	110	7	500	31
Shallow Calcareous Loam 8-12	22	443	20	--	--	1055	48
Silty 8-10	21	344	16	--	--	825	39
Loamy 5-8	19	833	44	744	39	--	--
Sodic Terrace 6-8	28	--	--	755	27	--	--
Sodic Terrace 8-10	24	--	--	619	26	--	--
Other[b]	12	--	--	22	2	--	--
Total		2480	134	2250	101	2380	118
Equivalent acres per AUM		18.5		22.3		20.2	

Note: AUM = animal unit month.

a Based on Fair Range Condition (upper stocking rate) SCS Technical Guide, Ely, Nevada.

b Saline Meadow 5-12, Saline Bottom 5-12, Sodic Flat 5-12.

Table 4-1

Ambient Air Quality Standards
and Class II PSD Increments
(micrograms per cubic meter)

Pollutant and Averaging Time	National Ambient Air Quality Standards Primary	National Ambient Air Quality Standards Secondary	Nevada Ambient Air Quality Standards	Class II PSD Increments[b]
Sulfur Dioxide				
3-Hour[a]	--	1300	1300	512
24-Hour[a]	365	--	365	91
Annual Arithmetic	80	--	80	20
Particulate Matter				
24-Hour[a]	260	150	150	37
Annual Geometric	75	60	60	19
Nitrogen Dioxide				
Annual Arithmetic	100	100	100	--
Carbon Monoxide				
1-Hour[a]	40,000	40,000	40,000	--
8-Hour[a]	10,000	10,000	10,000	--
Ozone				
1-Hour[a]	235	235	235	--

[a] Short-term national standards and national and Nevada PSD increments (24 hours or less) not to be exceeded more than once per year, at any location. Short-term Nevada standards not to be exceeded.

[b] PSD increments are exceeded if air quality impacts from all PSD sources in the area exceed these levels. PSD sources include all sources in the area for which a PSD permit is applied on or after the PSD baseline data. The baseline data is set by the first major source or major modification to apply for a PSD permit after August 7, 1977.

Table 4-2

Air Emissions
WPPP Generating Station
(tons/year)

Pollutant	Butte Valley Site	North Steptoe Valley Site	Spring Valley Site	Significance Level
Sulfur dioxide	18,553	16,330	17,811	40
Oxides of nitrogen[a]	18,037	18,037	18,037	40
Particulate Matter	1176	1176	1176	25
Carbon monoxide	3088	3088	3088	100
Volatile organic compounds	31	31	31	40
Beryllium	0.3	0.3	0.3	0.0004
Fluorides	106	106	106	3
Lead	0.2	0.2	0.2	0.6
Mercury	0.2	0.2	0.2	0.2
Sulfuric acid mist	442	460	424	7

[a] As nitrogen dioxide.

Note: Emissions of oxides of nitrogen and total suspended particulates are based on federal New Source Performance Standards of 0.6/0.5 pounds per million Btu, and 0.03 pounds per million Btu respectively. Emissions of sulfur dioxide and sulfuric acid mist are also based on federal standards associated with Prevention of Significant Deterioration increments. Application of Best Available Control Technology would result in lower emissions.

Table 4-3

Air Quality Modeling Results
(micrograms per cubic meter)

Pollutant and Averaging Period	Butte Valley Site			North Steptoe Valley Site			Spring Valley Site		
	WPPP	Background	Total	WPPP	Background	Total	WPPP	Background	Total
Sulfur Dioxide[a]									
3-hour	505	301	806	499	401	900	505	492	997
24-hour	87	52	139	80	86	166	78	181	259
Annual	12	2	14	6	3	9	9	8	17
Particulate Matter									
24-hour	23	55	78	26	36	62	31	30	61
Annual	4	8	12	6	8	14	8	7	15
Nitrogen Dioxide									
Annual	12	0.1	12	6	0.1	6	9	0.1	9
Carbon Monoxide									
1-hour	257	0	257	375	0[b]	375	298	0[b]	298
8-hour	35	0	35	61	0[b]	61	40	0[b]	40
Mercury									
24-hour	--	--	0.0020	--	--	0.0024	--	--	0.0014
Fluorides									
24-hour	--	--	0.68	--	--	0.82	--	--	0.48
Beryllium									
24-hour	--	--	0.0017	--	--	0.0020	--	--	0.0012

[a] Sulfur dioxide control technology levels equal to 75 percent at the Butte Valley Site, 78 percent at the North Steptoe Valley site, and 76 percent at the Spring Valley Site. Highest, second-highest concentrations for averaging periods of 24 hours or less.

[b] Carbon monoxide background not monitored and assumed zero.

Table 4-4

Potential Disturbance to Soils and Ecological Sites

Mapping Unit Number	Soil Series	Ecological Site	Potential Disturbance (acres)
		Butte Valley Site	
1042	Oupico		
1500	Blimo	Loamy 8-10	860
1500	Uwell		
1500	Raph	Loamy 5-8	833
2110	Fontreen		
2110	Hyzen	Shallow Loamy Slope 12-16	-
2140	Ursine	Shallow Calcareous Loam 8-12	443
2180	Lusetti	Silty 8-10	344
		Total	2480
		North Steptoe Valley Site	
1040	Sanpete	Loamy 8-10	110
1080	Dera	Loamy 5-8	744
1480	Duffer, Flooded	Saline Meadow 5-12	
1480	Equis	Saline Bottom 5-12	22
1480	Boofus	Sodic Flat 5-12	
1840	Riepe	Sodic Terrace 6-8	755
1840	Stimca	Sodic Terrace 8-10	619
		Total	2250
		Spring Valley Site	
1011	UN-One	Sodic Terrace 8-10	-
1040	Sanpete	Loamy 8-10	500
1080	Dera	Loamy 5-8	-
2140	Ursine	Shallow Calcareous Loam 8-12	1055
2180	Lusetti	Silty 8-10	825
2261	UN-Three	Saline Bottom 5-12	-
		Total	2380

Table 4-5

Visual Sensitivity Ratings
Power Generation System

Visual Factors	Site: Butte Valley	Site: North Steptoe Valley		Site: Spring Valley
Population exposure source	No major source Minor transitory and permanent	Transitory (Hwy 93)	Recreational/ Permanent (Cherry Creek)	Transitory (Hwys 93 and 6/50)
Distance Zone	Middleground	Foreground/ Middleground	Background	Middleground
Initial sensitivity rating	Minimum	Low		Minimum
Modifications to rating				
Visibility level	No major source	Open normal (+1)		Open normal (+1)
Landscape condition	Natural (+2)	Natural Dominance (+1)		Natural Dominance (+1)
Area of exceptional scenic quality	No (0)	No (0)		Yes (+1)
Net modification	+2	+2		+3
Derived sensitivity rating	Moderate	High		High

Note: Appendix A of the Visual Resources Baseline technical report includes a discussion of rating derivation methodology.

Table 4-6

Visual Sensitivity Ratings
Water Supply System

Visual Factors	Site		
	Butte Valley	North Steptoe Valley	Spring Valley
Population exposure source	Transitory (Hwy 93)	Transitory (Hwy 93)	Transitory (Hwy 93 and Hwy 6/50)
Distance Zone	Middleground	Middleground	Middleground
Initial sensitivity training	Minimum	Minimum	Minimum
Modifications to rating			
Visibility level	Open inferior (-1)	Open inferior (-1)	Open inferior (-1)
Landscape condition	Natural (+2)	Natural Dominance (+1)	Natural (+2)
Net modification	+1	Ø	+1
Final rating	Low	Minimum	Low

Table 4-7

Visual Impacts
Coal Transportation System

Visual Factors	Butte Valley Site				North Steptoe Valley Site				Spring Valley Site			
	NP	NA	SP	SA	NP	NA	SP	SA	NP	NA	SP	SA
Approximate length of new rail (miles)	25	80	160	--	5	50	160	170	120	100	70	70
Number of major highways crossed by new rail	1	1	4	0	2	1	1	3	3	3	0	0
Number of major highays not crossed, but from which new rail is visible	0	0	0	0	0	0	0	0	0	0	1	1
Expected significance of visual impact	Low	Low	Low	--	Min	Low	Low	Low	Low	Low	Low	Low

Note: NP - Northern Preferred; NA - Northern Alternate; SP - Southern Preferred; SA - Southern Alternate

Table 4-8

WPPP Work Force Requirements

Year/Quarter	Construction	Operation	Total
1986 - 2	40	0	40
3	100	0	100
4	70	0	70
1987 - 1	50	0	50
2	150	0	150
3	285	10	295
4	460	10	470
1988 - 1	650	25	675
2	850	25	875
3	1155	25	1180
4	1350	25	1375
1989 - 1	1665	45	1710
2	1915	65	1980
3	2120	85	2205
4	2230	105	2335
1990 - 1	2280	145	2425
2	2320	185	2505
3	2345	225	2570
4	2320	265	2585
1991 - 1	2310	300	2610
2	2260	330	2590
3	2135	365	2500
4	1950	400	2350
1992 - 1	1575	465	2040
2	850	530	1380
3	255	530	785
4	45	530	575
1993 - 1	0	530	530

Peak Construction = 1990/3rd quarter (2345 workers)
Peak Operation = 1992/2nd quarter (530 workers)
Peak Employment = 1991/1st quarter (2610 workers)

Table 4-9

Population Projections With and Without WPPP

	1986		1987		1988		1989		1990		1991		1992		1993	
	With WPPP	Without WPPP	With WPPP	Without WPPP	With WPPP	Without WPPP	With WPPP	Without WPPP	With WPPP	Without WPPP	With WPPP	Without WPPP	With WPPP	Without WPPP	With WPPP	Without WPPP
County	8785	8785	9570	8910	11,220	9035	12,935	9160	13,615	9285	13,733	9378	10,815	9470	10,845	9565
Ely	5271	5271	5834	5346	6980	5421	8289	5496	8836	5571	8917	5626	6986	5682	6981	5739
McGill	1493	1493	1527	1515	1576	1536	1625	1558	1658	1579	1674	1595	1639	1611	1655	1627
Ruth	527	527	540	535	559	542	555	550	574	557	601	563	582	569	587	574

Note: Projections with WPPP are estimates for the fourth quarter, except for 1989 which is for the first quarter when WPPP employment peaks.

Table 4-10

Total Estimated WPPP Work Force Payrolls and Net Disposable Income
($1000)

	1986	1987	1988	1989	1990	1991	1992
Construction Workforce							
Median Total Payroll	1202	5408	21,701	44,778	53,175	57,320	15,648
Net Disposable Income							
- Weekly[a]	0	1439	7292	16,613	20,100	21,667	5696
- Daily/Relocatees[b]	841	2347	7899	14,732	17,123	18,457	5258
Total	841	3786	13,191	31,345	37,223	40,124	10,954
Net Disposable Income Spent in White Pine County:							
- Weeklies[c]	0	216	1094	2492	3015	3250	854
- Dailies & Relocatees[d]	631	1760	5924	11,049	12,842	13,843	3944
Total	631	1976	7018	13,541	15,857	17,093	4798
Operation Workforce							
Median Total Payroll	0	293	1066	1894	5216	8903	13,135
Net Disposable Income	0	205	746	1326	3651	6232	9194
Net Disposable Income Spent in White Pine County[d]	0	154	540	928	2738	4674	6896
Total Net Disposable Income Spent in White Pine County	631	2130	7578	14,469	18,595	21,767	11,694

a Based on average quarterly split of weekly commuters in the WPPP construction workforce.

b Based on average quarterly split of daily and relocating workers in the WPPP construction workforce.

c Based on 15 percent of net disposable income.

d Based on 75 percent of net disposable income.

Table 4-11

White Pine County School District
Occupancy With and Without WPPP

School	Current Occupancy (1984)	Capacity	Occupancy Without WPPP 89-90	90-91	91-92	92-93	Occupancy With WPPP 89-90	90-91	91-92	92-93	Year Capacity Exceeded
White Pine High	452	725	434	435	435	435	531	570	582	543	
White Pine Junior High	278	275	266	267	267	267	308	323	330	313	1987[a]
Elementary											
East Ely	85	100	NA	NA	NA	NA	NA	NA	NA	NA	
Ely and Murry Street	358	500	NA	NA	NA	NA	NA	NA	NA	NA	
Total Ely Elementary	443	600	426	427	427	427	837	896	856	544	1987[a]
Balance of County	328	900	313	316	316	316	329	334	335	320	

NA: Not available.

[a] With WPPP; capacity is adequate for projection period without WPPP.

Table 4-12

Law Enforcement Needs With WPPP

Areas of Concern	Projected Total Need With WPPP 1991	Projected Total Need With WPPP 1993	WPPP Related Need Only 1991	WPPP Related Need Only 1993
Personnel (existing)				
Patrol Officers (11 in County, 9 in Ely)	14.5-County 13.0-Ely 27.5-total	11.5-County 10.5-Ely 22-total	3.5-County 5.0-Ely 8.5 total	0-County 2-Ely 2 total
Administrators (deputized) (4)	4	4	0	0
Clerical (Sheriff's Dept.)	1	1	1	1
Jailers	6	6	0	0
Investigators (2 for several counties)	2	2	0	0
Juvenile Officers (1)	3	3	0.75	0.75
Juvenile Probation Officers (1.5)	2.25	2.25	.75	.75
Highway Patrol (3)	6[a]	5	2	1
State Patrol and Probation Officers (1 and 0.5 secretary)	2 1 secretary	1.5 1 secretary	1	0.5
District Attorney (1.5)	2.5	2	0.75	0.25
Vehicles				
Sheriff's Dept. (15 cars and 1 four wheel)	14 1-four wheel	13 1-four wheel	0 0	0 0
Highway Patrol (3)	6	5	2	1
Facilities				
County Jail (16 male and 4 female cells)	26 cells (male) 2 cells (female)	11 cells (male) 2 cells (female)	10 cells 0	0 0
Juvenile Detention Center (2 rooms)	13 cells	9 cells	7 cells	3 cells

[a] An additional officer may be needed during peak employment depending upon plant location and transit system.

Table 4-13

Public Health Services Needs With WPPP

Area of Concern	Existing Condition (1980)	Projected Total Need With WPPP		WPPP Related Need Only	
		1991	1993	1991	1993
Staffing					
Total Physicians	4.5	7.0	6.0	2.5	1.5
Physician Assistants	0	1.0	0	1.0	0
Dentists	3.0	3.5	3.0	0.5	0
Registered Nurses (RN)	29.0	39.0	31.0	12.0	4.0
Licensed Practical Nurses (LPN)	18.0	34.0	27.0	10.0	3.0
Pharmacists	7.0	9.0	7.0	3.0	1.0
Physical Therapists	1.0	1 physical therapist 1 aide	1 physical therapist 1 aide	0	0
Emergency Medical Technicians (EMT)	30 active	50 EMTs	39 EMTs	16.0	5.0
Facility Use					
Short Stay Beds	15,695 patient days or 43 beds	10,986 patient days or 30 beds	8676 patient days or 24 beds	0	0
Long-term Beds	98 (95% occup.)	92.0	58.0	0	0
Ambulance Service					
Total Ambulances	4 full-time 1 backup	7.0	6.0	2.0	1.0

Table 4-14

Recreation Facility Needs With and Without WPPP

Facility (Existing)	Year	With WPPP	Without WPPP
Playlots (8)	1991	14	11
	1993	13	12
Neighborhood Parks (17 acres)	1991	27	19
	1993	22	19
Indoor Community Recreation Centers (0)	1991	1	1
	1993	1	1
Multi-Purpose Courts (6)	1991	14	9
	1993	11	9
Basketball Courts (8 indoor)	1991	14	9
	1993	11	9
Roller Skating Rinks (0.5) Raquetball Courts (0)	1991	1	1
	1993	1	1
Tennis Courts (5)	1991	7	5
	1993	5	5

Note: The County also has horse stables. No guidelines are available to determine if the stables are sufficient to accommodate demands.

Table 4-15

Impacts on Land Productivity

Site	Grazing Allotment	Total Allotment[a] (AUMs)	AUMS Affected By WPPP Site	Percent of Total
Butte Valley	Thirty Mile Spring	8755	263	3.0
North Steptoe Valley	Cherry Creek	5773	289	5.0
Spring Valley	Majors	12,535	626	5.0
	Willard Creek	1132	57	5.0

AUM = animal unit month.

[a] Source: Bureau of Land Management-Ely District Office.

Table 4-16

Distribution of Estimated WPPP Tax Revenues
To State and Counties
(Thousands of 1983 Dollars)

Entity	Revenue[a]	Percent
State of Nevada	89,309	20.76
Carson City	10,847	2.52
Churchill County	3,395	0.79
Clark County	163,635	38.04
Douglas County	9,805	2.28
Elko County	4,277	0.99
Esmeralda County	242	0.06
Eureka County	328	0.08
Humboldt County	3,090	0.72
Lander County	1,646	0.38
Lincoln County	1,298	0.30
Lyon County	4,766	1.11
Mineral County	1,246	0.29
Nye County	3,114	0.72
Pershing County	846	0.20
Storey County	480	0.11
Washoe County	63,182	14.69
White Pine County	68,664	15.96
Total	430,170	100.00

[a] Includes all taxes paid by WPPP during the construction period (6 years) and the operation period (36 years)

Table 4-17

Distribution of Estimated WPPP Tax Revenues
To Local Governmental Entities
(Thousands of 1983 Dollars)

Entity[a]	Ad Val[b]	BCCRT[c]	SCCRT[d]	LSST[e]	Total[f]
Carson City	1902	673	2356		4931
Carson Water Sub	9				9
Carson Truckee	4				4
School District	3883			2020	5903
Total	5798	673	2356	2020	10,847
Churchill County	452	144	504		1100
Fallon	122	63	222		407
Carson Truckee	1				1
School District	1265			622	1887
Total	1840	207	726	622	3395
Clark County	26,648	4301	15,052		46,001
Boulder City	139	186	651		976
Henderson	112	473	1654		2239
Las Vegas	11,894	3194	11,179		26,267
North Las Vegas	743	829	2901		4473
Bunkerville	3				3
Mesquite	28				28
Paradise	3122				3122
Searchlight	2				2
Spring Valley	114				114
Sunrise Manor	127				127
Winchester	837				837
School District	52,499			26,947	79,446
Total	96,268	8983	31,437	26,947	163,635

Table 4-17

Distribution of Estimated WPPP Tax Revenues
To Local Governmental Entities
(Thousands of 1983 Dollars)

Entity[a]	Ad Val[b]	BCCRT[c]	SCCRT[d]	LSST[e]	Total[f]
Douglas County	1078	645	2257		3980
Gardnerville	98				98
Genoa	10				10
Minden	96				96
Carson Truckee	3				3
Carson Water Sub	8				8
Elk Pt. Sanitation	19				19
Gdnvl Ranchos	87				87
Indian Hills	34				34
Logan Creek GID	1				1
Mnd/Gdnvl Sani.	39				39
Oliver Park GID	2				2
Round Hill GID	31				31
Topaz Ranch GID	17				17
Zephyr Heights	2				2
Zephyr Knolls	*				*
School District	3443			1935	5378
Total	4968	645	2257	1935	9805
Elko County	407	89	312		
Carlin	62	18	64		
Elko	302	129	451		
Wells	34	18	63		
Montello	6				
Mountain City	1				
West Wendover	4				
School District	1554			763	
Total	2370	254	890	763	4277
Esmeralda County	60	13	47		120
Goldfield	2				2
Silver Peak	1				1
School District	79			40	119
Total	142	13	47	40	242

Table 4-17

Distribution of Estimated WPPP Tax Revenues
To Local Governmental Entities
(Thousands of 1983 Dollars)

Entity[a]	Ad Val[b]	BCCRT[c]	SCCRT[d]	LSST[e]	Total[f]
Eureka County	44	21	73		138
Crescent Valley	2				2
School District	125			63	188
Total	171	21	73	63	328
Humboldt County	425	99	347		871
Winnemucca	300	78	272		650
School District	1039			530	1569
Total	1764	177	619	530	3090
Lander County	561	81	285		927
School District	474			245	719
Total	1035	81	285	245	1646
Lincoln County	194	56	195		445
Caliente	52	20	70		142
Alamo	1				1
Panaca	7				7
Pioche	37				37
School District	439			227	666
Total	730	76	265	227	1298
Lyon County	1003	240	841		2084
Yerington		42	147		189
Fernley	14				14
Carson Truckee	1				1
Carson Water Sub	2				2
Penrose GID	*				*
School District	1630			846	2476
Total	2650	282	988	846	4766

Table 4-17

Distribution of Estimated WPPP Tax Revenues
To Local Governmental Entities
(Thousands of 1983 Dollars)

Entity[a]	Ad Val[b]	BCCRT[c]	SCCRT[d]	LSST[e]	Total[f]
Mineral County	323	66	232		621
School District	426			199	625
Total	749	66	232	199	1246
Nye County	402	172	602		1176
Gabbs	62	17	59		138
Amargosa	81				81
Beatty	14				14
Manhattan	5				5
Pahrump	17				17
Round Mountain	27				27
School District	1090			566	1656
Total	1698	189	661	566	3114
Pershing County	119	26	90		235
Lovelock	34	25	88		147
School District	311			153	464
Total	464	51	178	153	846
Storey County	103	28	99		230
Carson Truckee	*				*
School District	166			84	250
Total	269	28	99	84	480
Washoe County	10,872	1011	3538		15,421
Reno	1567	1897	6638		10,102
Sparks	1101	776	2715		4592
Carson Truckee	20				20
Crystal Bay GID	1				1
Horizon Hills	8				8
Incline Vlg GID	94				94
No. Lake Tahoe	280				280
Sun Vly Wtr/Swr	17				17
School District	21,597			11,050	32,647
Total	35,557	3684	12,891	11,050	63,182

Table 4-17

Distribution of Estimated WPPP Tax Revenues
To Local Governmental Entities
(Thousands of 1983 Dollars)

Entity[a]	Ad Val[b]	BCCRT[c]	SCCRT[d]	LSST[e]	Total[f]
White Pine Co.	102	2701	6440		9243
Ely		4196	7488		11,684
Lund	301				301
McGill	3721				3721
Ruth	1242				1242
School District	21,781			20,692	42,473
Total	27,147	6897	13,928	20,692	68,664
TOTAL	183,620	22,327	67,932	66,982	340,861

[a] Includes all Nevada entities receiving tax revenues from WPPP

[b] In lieu of ad valorem taxes

[c] Basic City/County Relief Tax

[d] Supplemental City/County Relief Tax

[e] Local School Support Tax

[f] Includes all taxes paid by WPPP during the construction period (6 years) and the operation period (36 years)

* Less than $1000

Table 4-18

Distribution of Work Force by Community
(percent)

	Butte Valley Site	North Steptoe Valley Site	Spring Valley Site
Construction Period			
City of Ely	55.0	54.0	55.0
WPPP Site	43.0	43.0	43.0
Ruth	0.7	0.5	0.5
McGill	0.8	1.5	0.9
Lund	0.2	0.2	0.2
Baker	-	-	0.2
Cherry Creek	-	0.3	-
Eureka	0.3	-	0.2
Wells	-	0.5	-
Operation Period			
City of Ely	98.0	97.0	98.0
Ruth	1.0	0.5	0.5
McGill	1.0	2.0	1.0
Lund	-	-	-
Baker	-	-	0.5
Cherry Creek	-	0.5	-

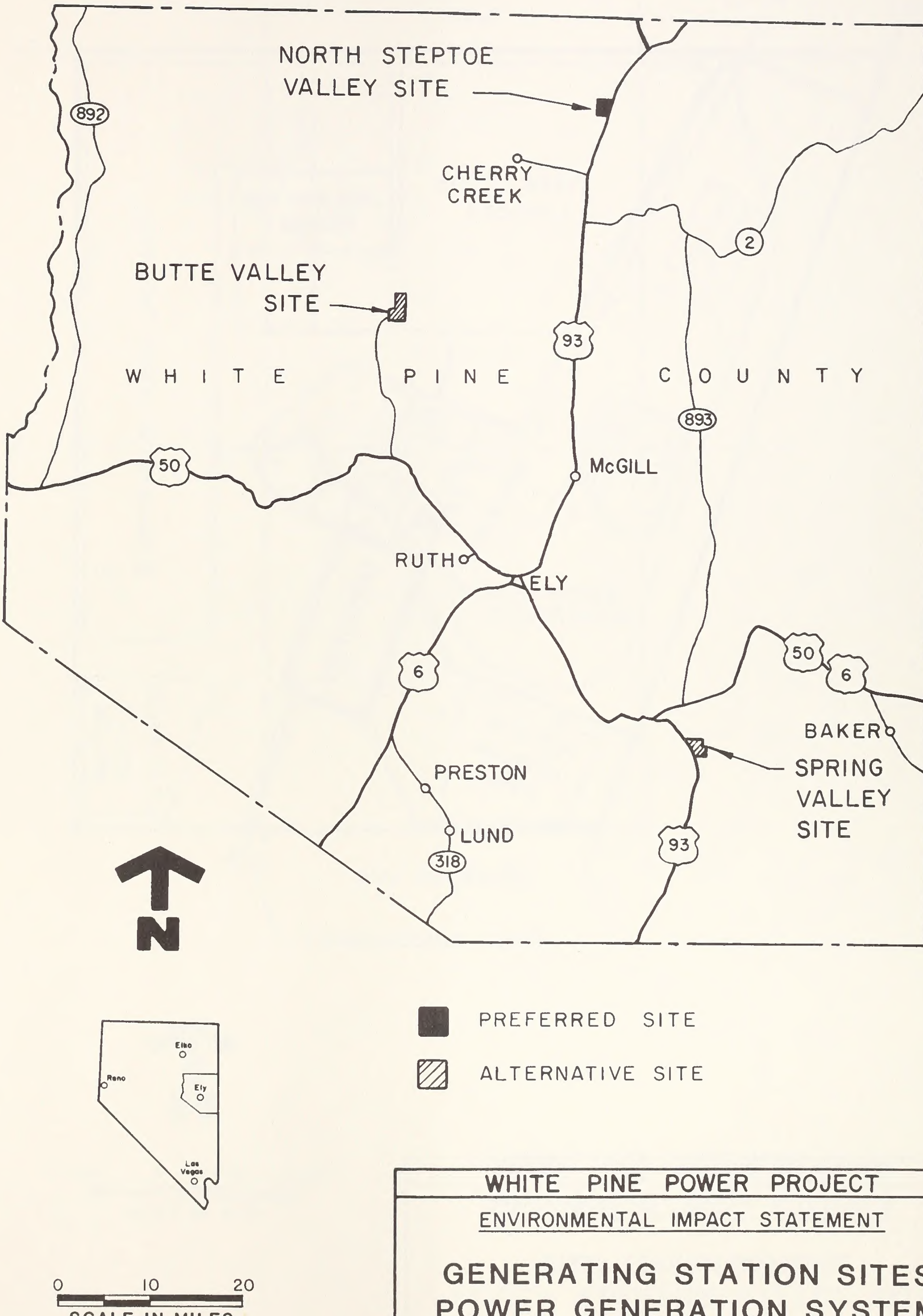
Note: The indirect work force for all three sites for both construction and operation would be distributed as follows: City of Ely - 95 percent; McGill - 5 percent.

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

LOCATION MAP

FIGURE 1-1

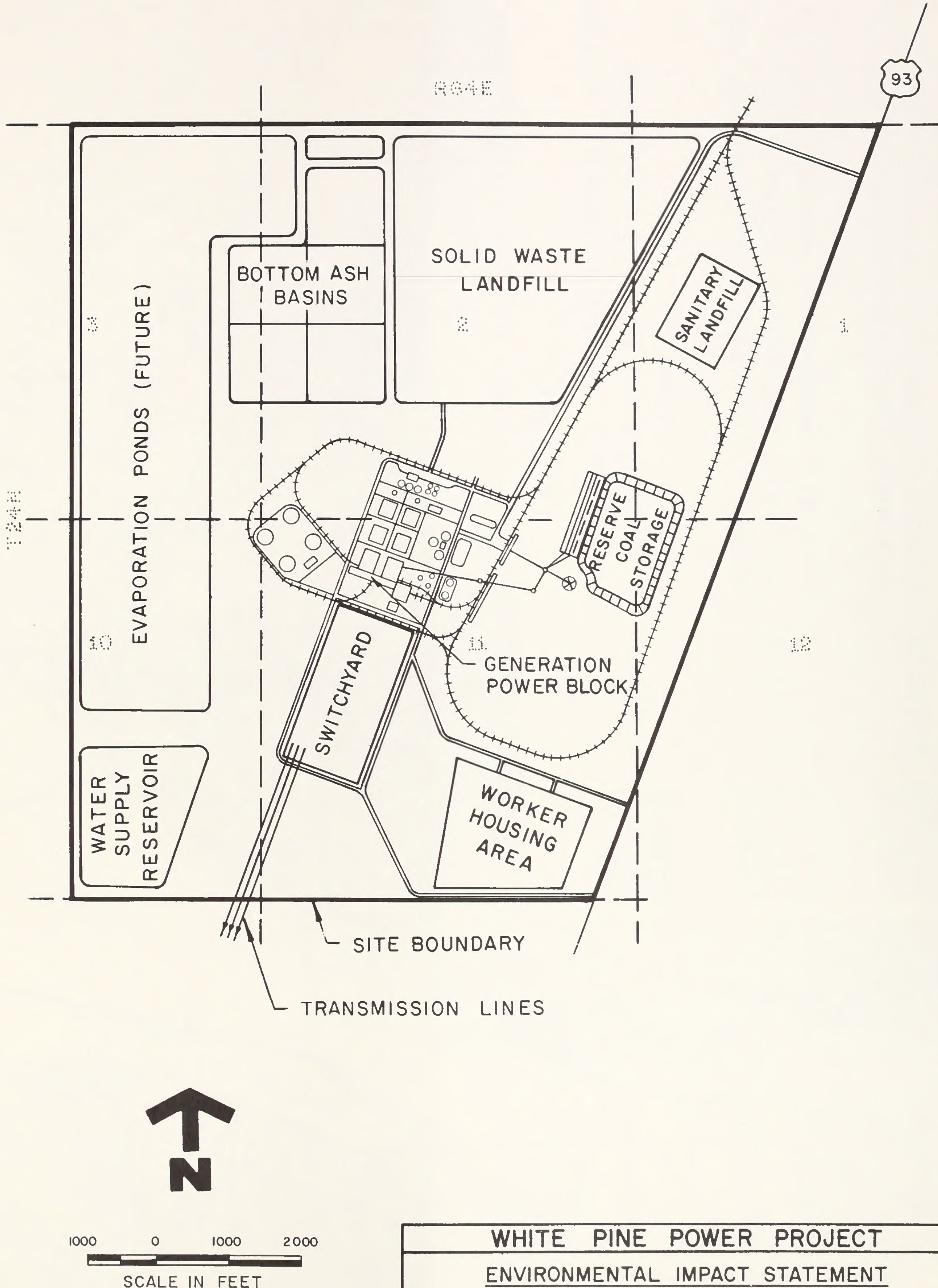


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

GENERATING STATION SITES
POWER GENERATION SYSTEM

FIGURE 2-1

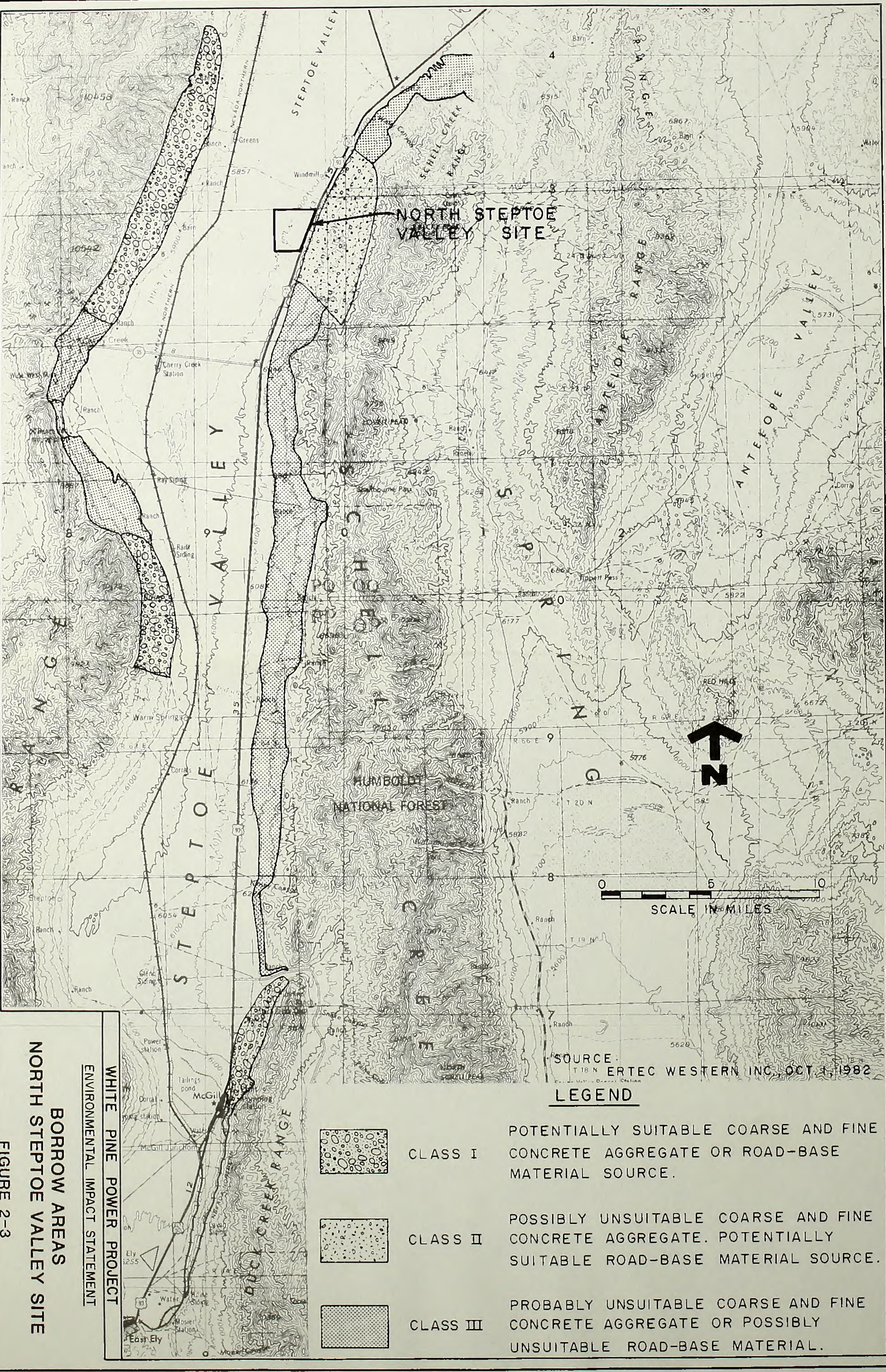


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

SITE ARRANGEMENT
NORTH STEPTOE VALLEY SITE

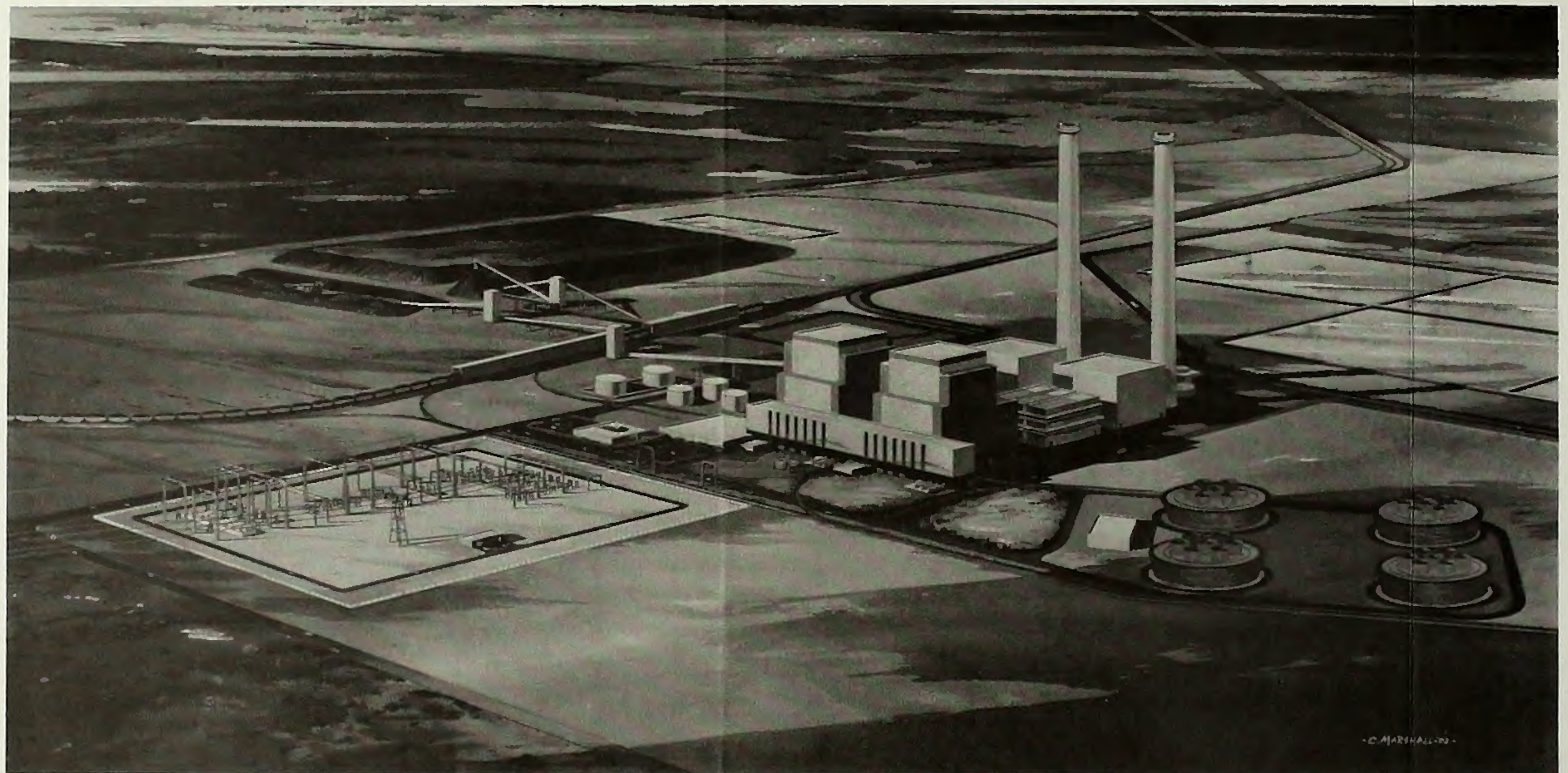
FIGURE 2-2

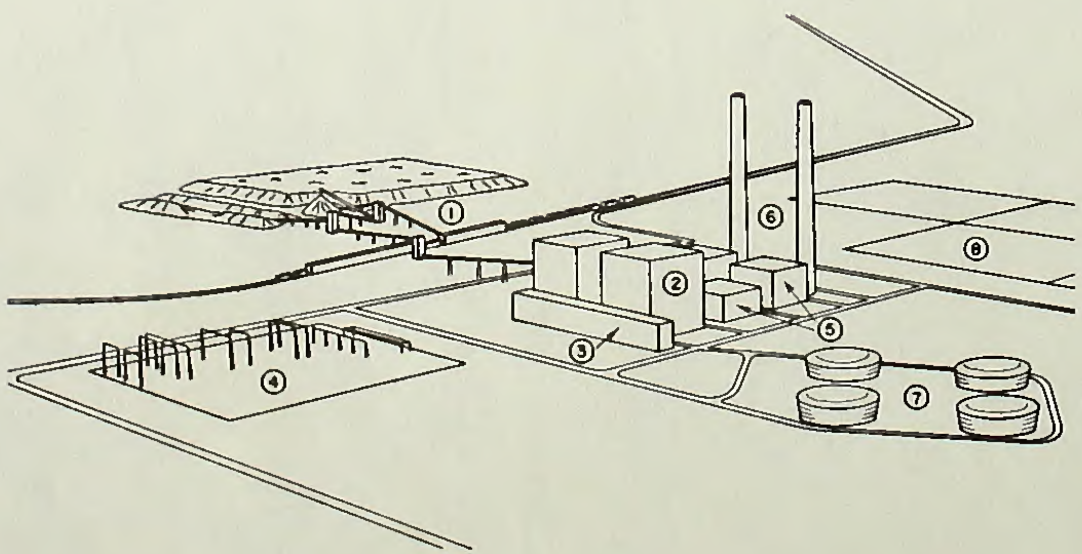


WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

BORROW AREAS
NORTH STEPTOE VALLEY SITE

FIGURE 2-3





LEGEND:

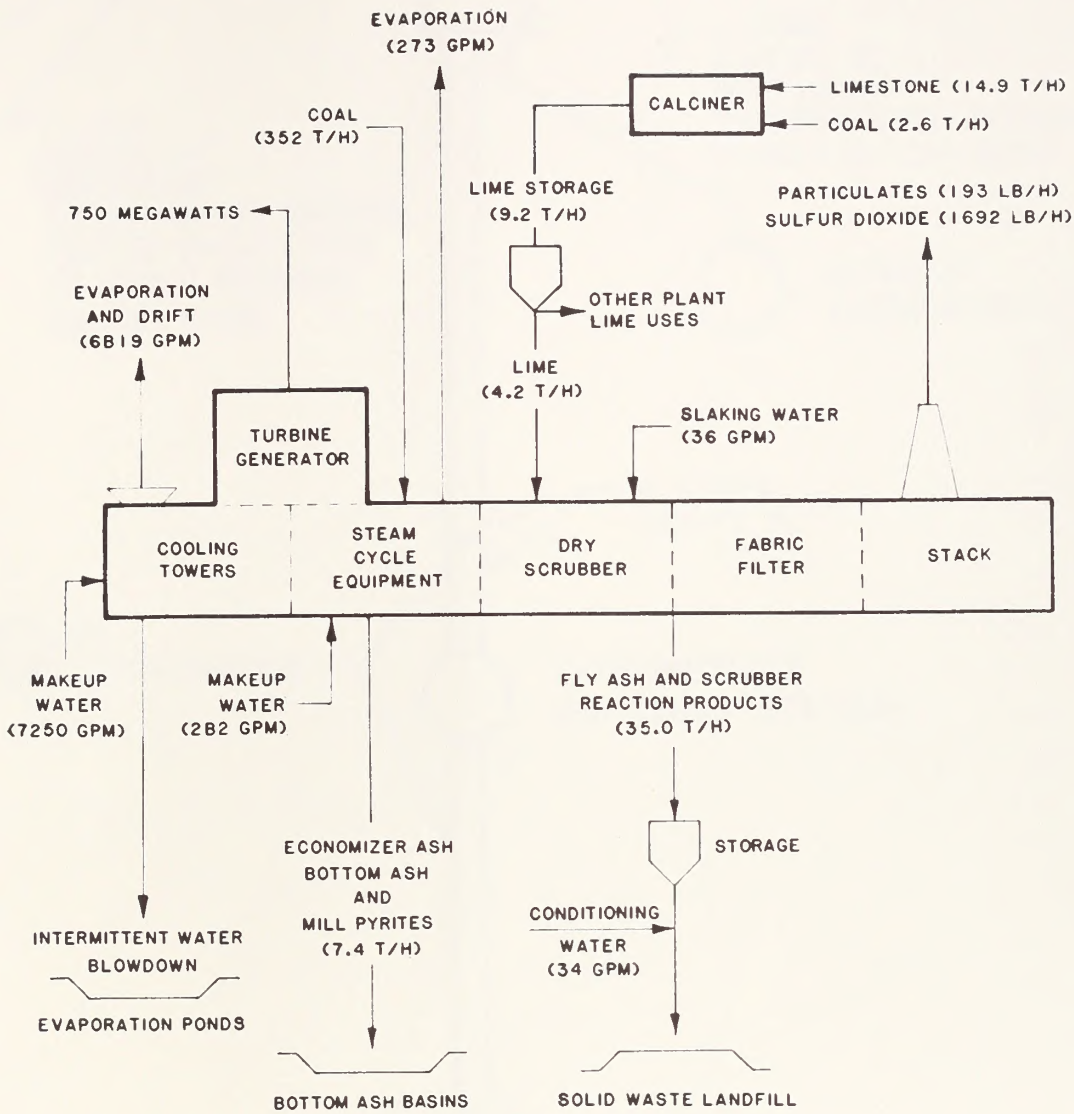
1. COAL UNLOADING AND STORAGE AREA
2. BOILERS
3. TURBINE-GENERATOR BUILDING
4. ELECTRICAL SWITCHYARD
5. AIR POLLUTION CONTROL EQUIPMENT
6. 750-FOOT STACKS
7. COOLING TOWERS
8. SOLID WASTE DISPOSAL AREA

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

GENERATING STATION RENDERING

FIGURE 2-4



T/H TONS PER HOUR
LB/H POUNDS PER HOUR
GPM GALLONS PER MINUTE

NOTES :

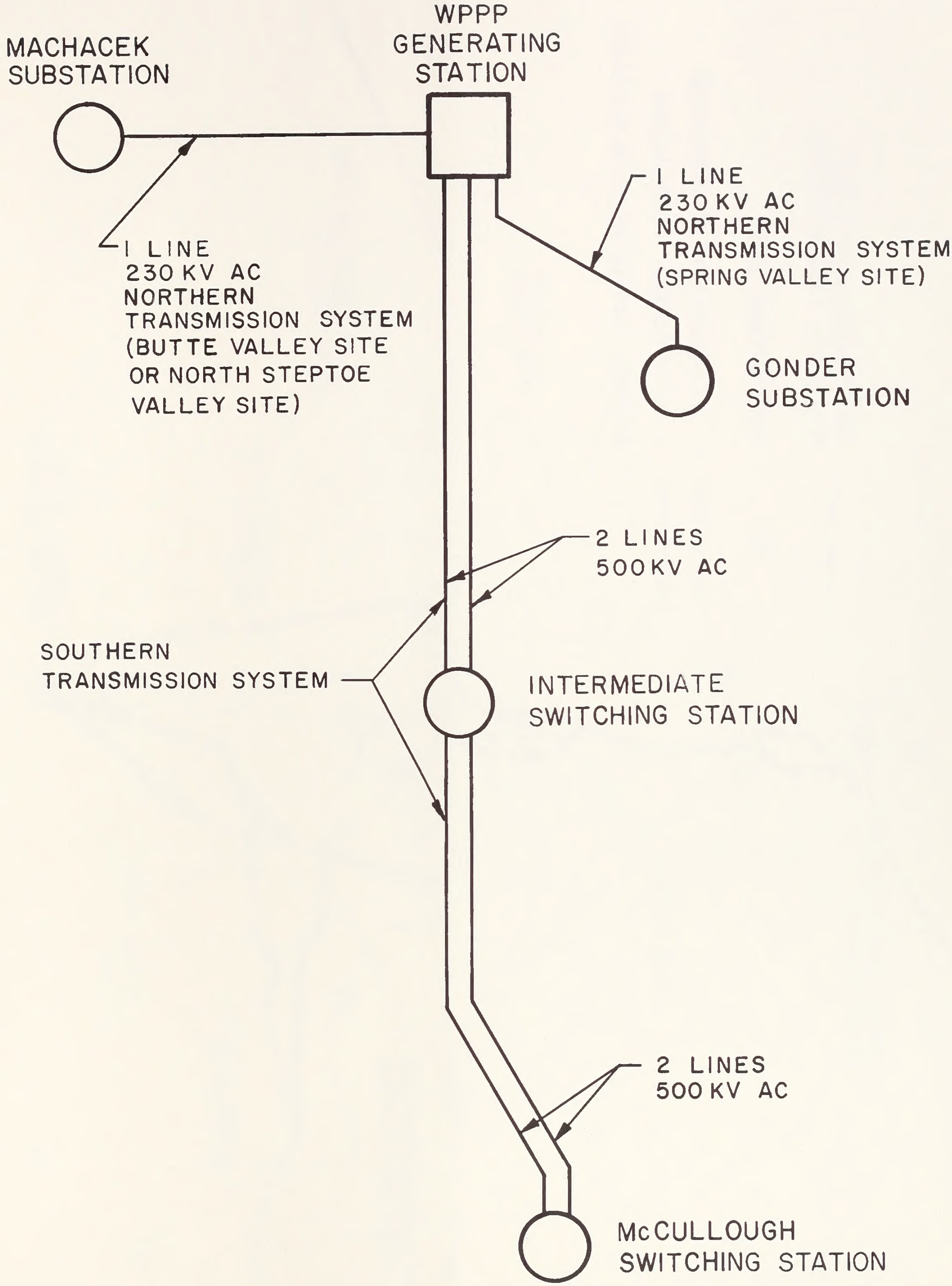
1. POWER PLANT QUANTITIES BASED ON SINGLE UNIT 100% FULL LOAD OPERATION WITH COMPOSITE COAL DURING PEAK SUMMER MONTHS.
2. CALCINER QUANTITIES BASED ON MAXIMUM LIME PRODUCTION FOR TWO UNITS.
3. AIR POLLUTION CONTROL BASED ON 80% SO_2 REMOVAL AND 0.026 POUNDS PER MILLION BTU PARTICULATE EMISSIONS.
4. PART OF COOLING TOWER BLOWDOWN NOT SHOWN TREATED AND RECYCLED TO COOLING TOWERS AND PART USED IN PLANT SYSTEMS NOT REQUIRING HIGH QUALITY WATER. ANY REMAINDER STORED IN EVAPORATION PONDS.

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

GENERATING UNIT DATA

FIGURE 2-5



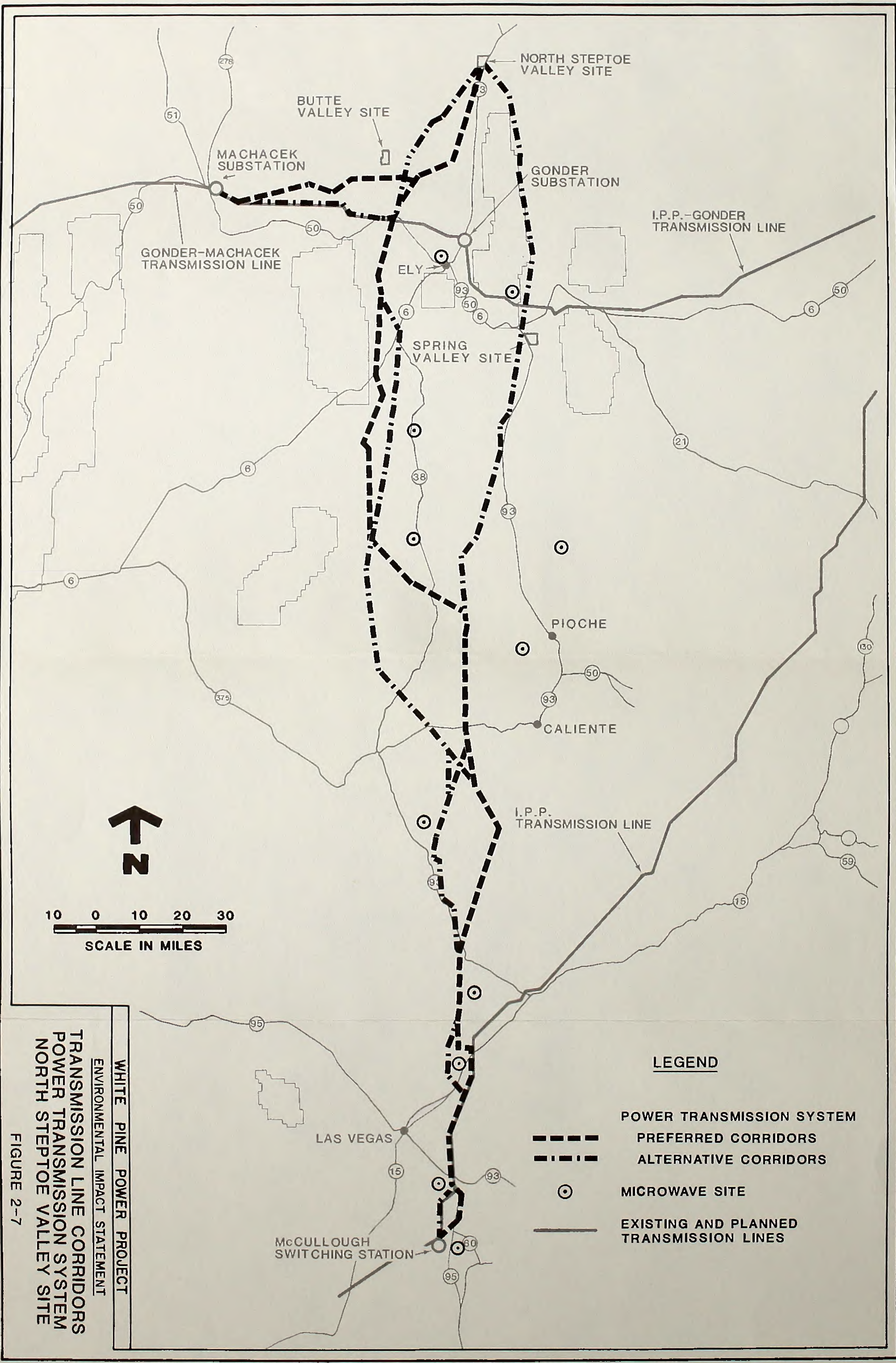
NO SCALE

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

SCHEMATIC DIAGRAM
POWER TRANSMISSION SYSTEM

FIGURE 2-6

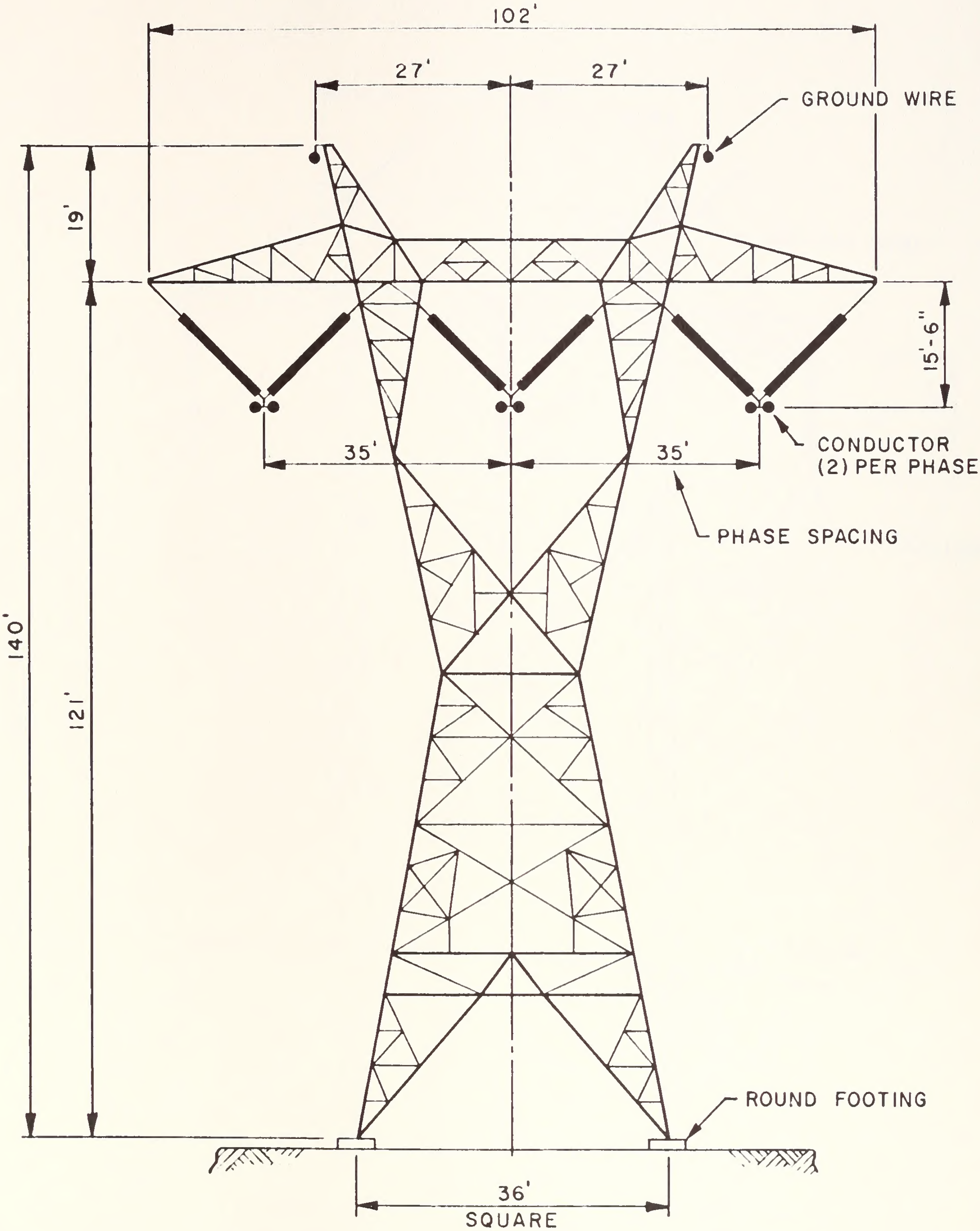


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

TRANSMISSION LINE CORRIDORS
POWER TRANSMISSION SYSTEM
NORTH STEPTOE VALLEY SITE

FIGURE 2-7



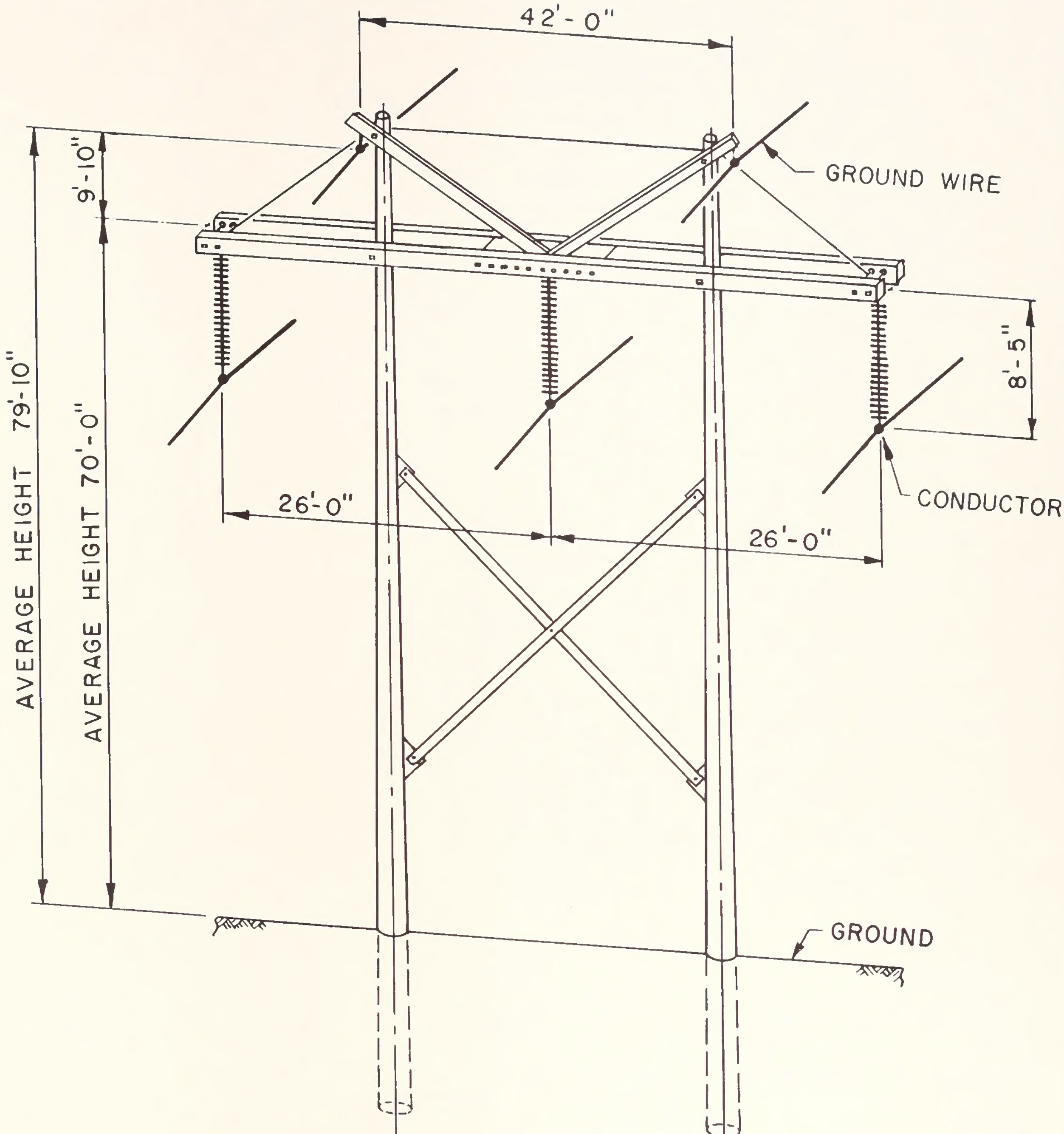
NO SCALE

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

TYPICAL SINGLE CIRCUIT 500 KV AC SUSPENSION TOWER

FIGURE 2-8

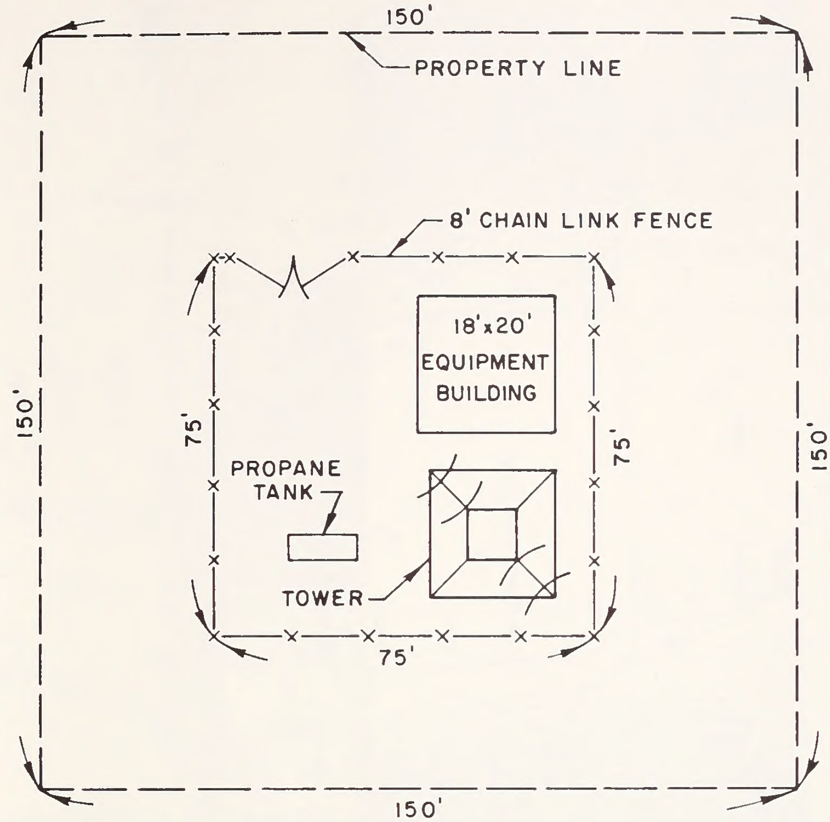


WHITE PINE POWER PROJECT

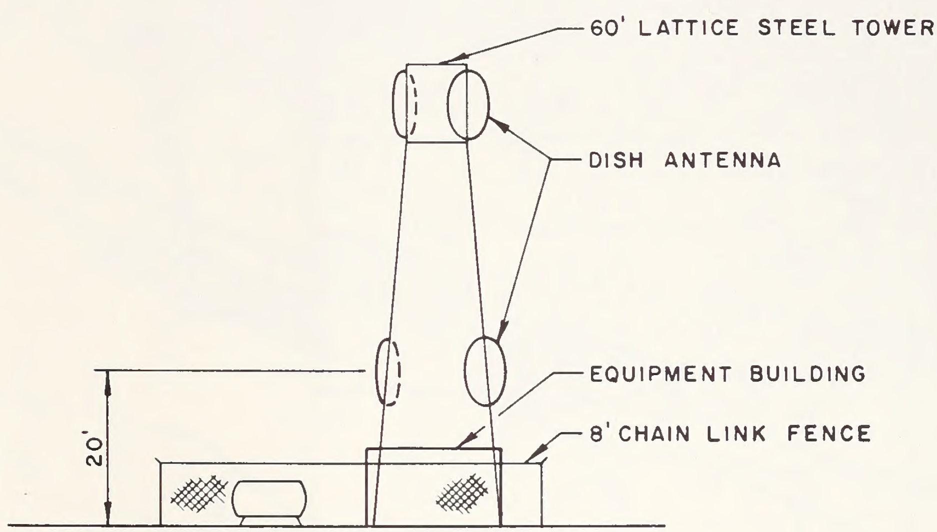
ENVIRONMENTAL IMPACT STATEMENT

TYPICAL SINGLE CIRCUIT WOOD-POLE H-FRAME 230 KV AC SUSPENSION TOWER

FIGURE 2-9



PLAN



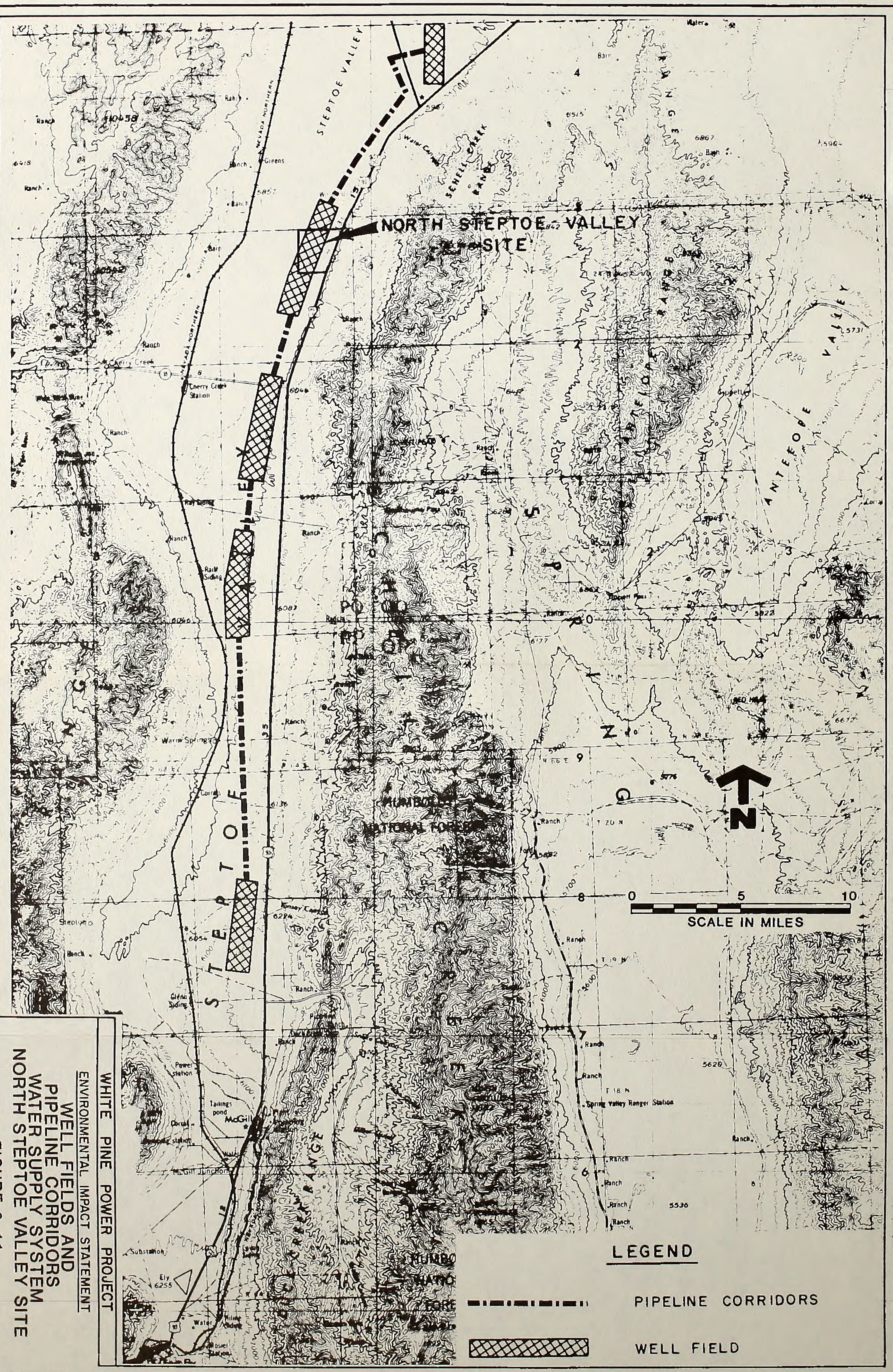
ELEVATION

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

TYPICAL EQUIPMENT LAYOUT
MICROWAVE REPEATER STATION

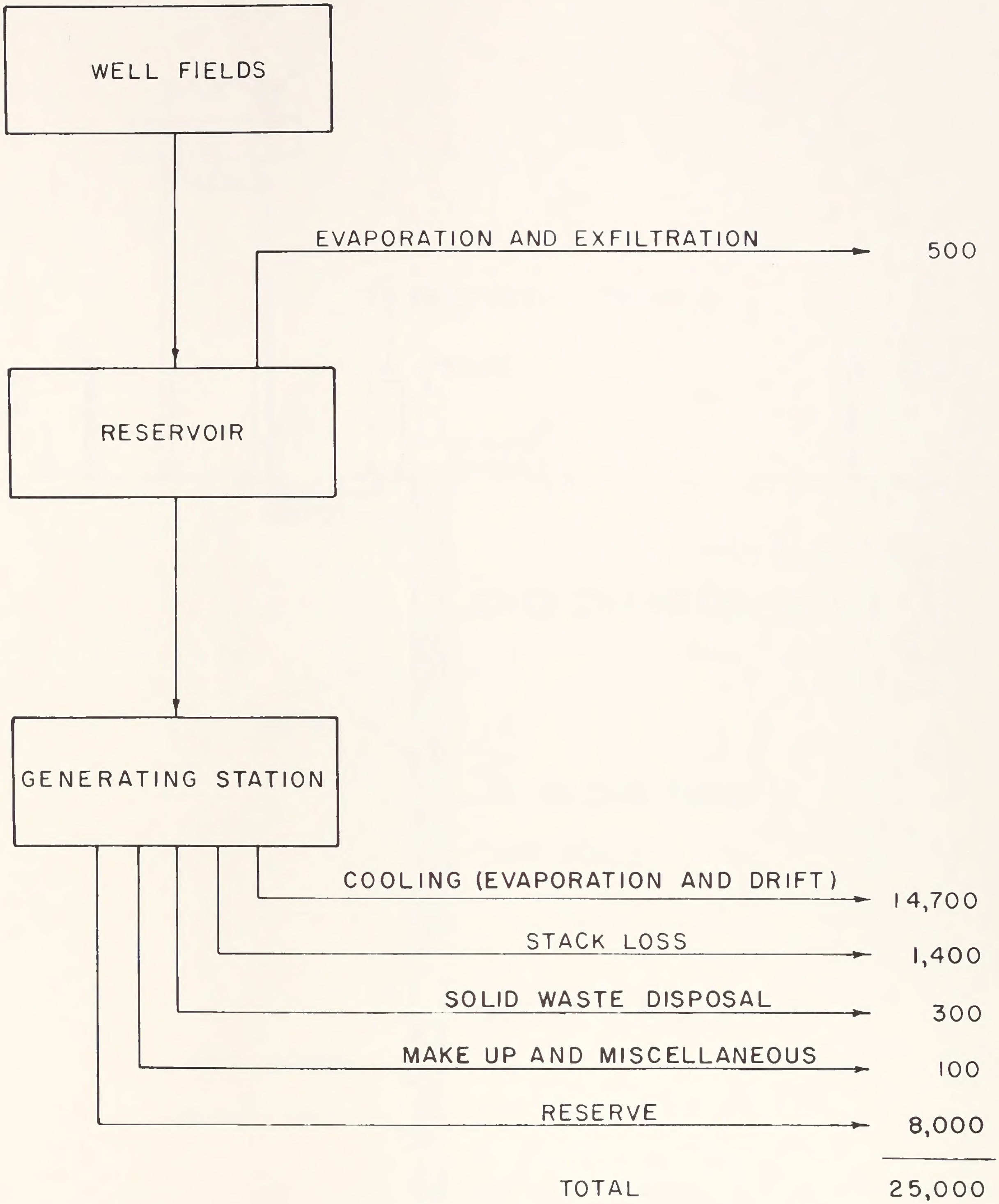
FIGURE 2-10



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

WELL FIELDS AND PIPELINE CORRIDORS WATER SUPPLY SYSTEM NORTH STEPTOE VALLEY SITE

FIGURE 2-11



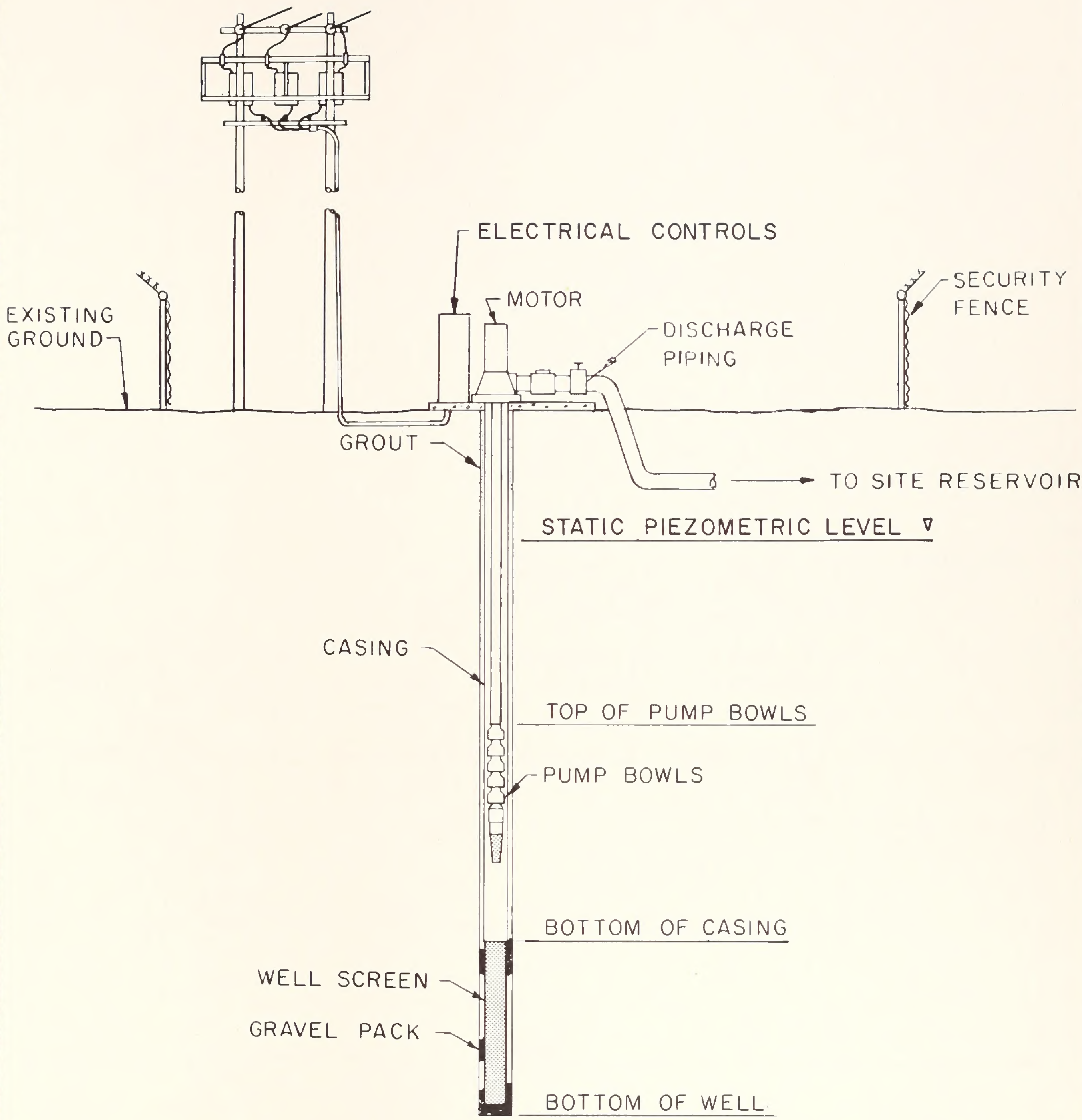
NOTES:
VALUES ARE IN ACRE-FEET PER YEAR. GENERATING STATION USAGE IS BASED ON NORMAL WEATHER CONDITIONS AND A 68 PERCENT CAPACITY FACTOR.

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

WATER BUDGET

FIGURE 2-12

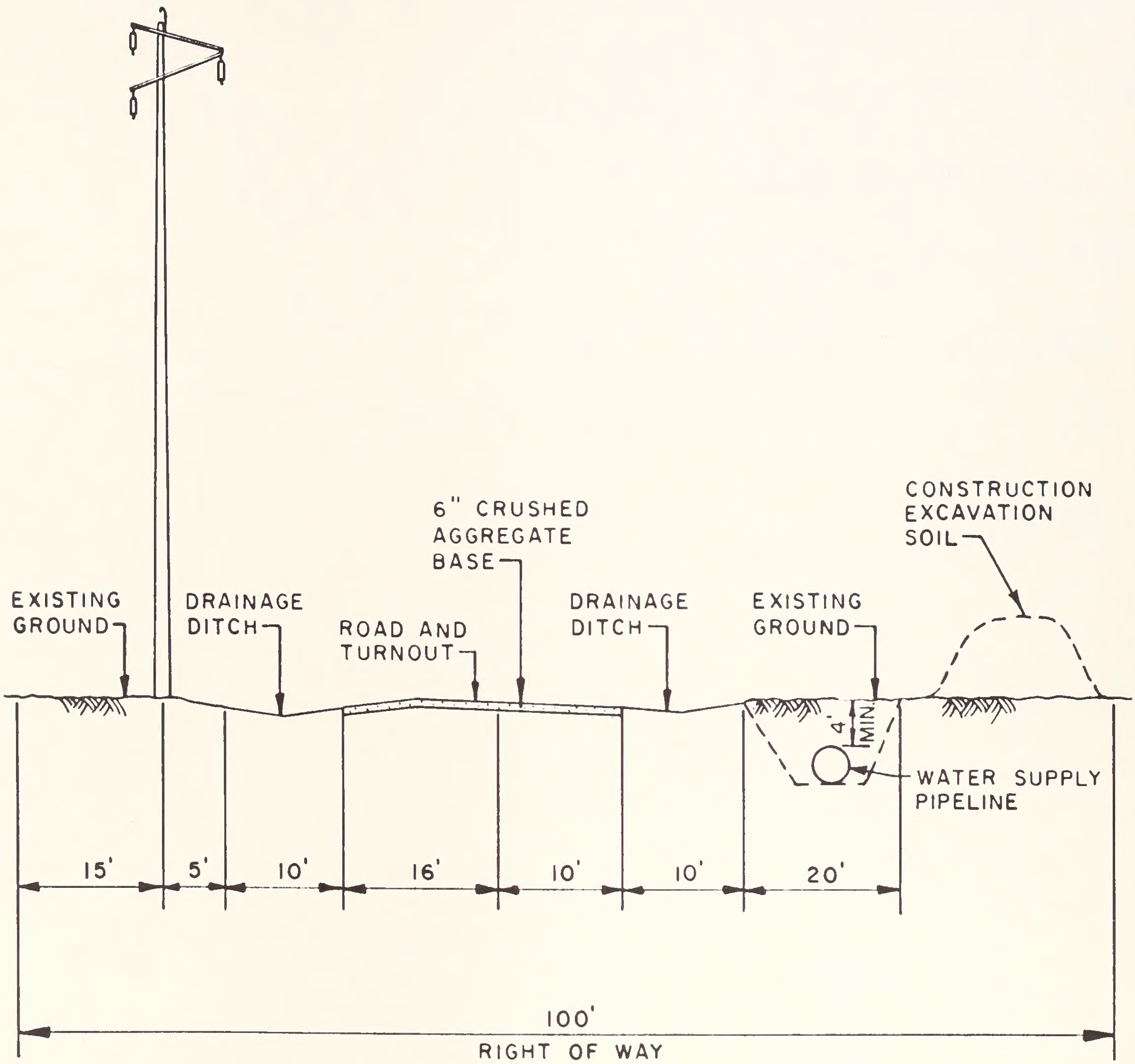


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

TYPICAL WELL PUMP INSTALLATION

FIGURE 2-13

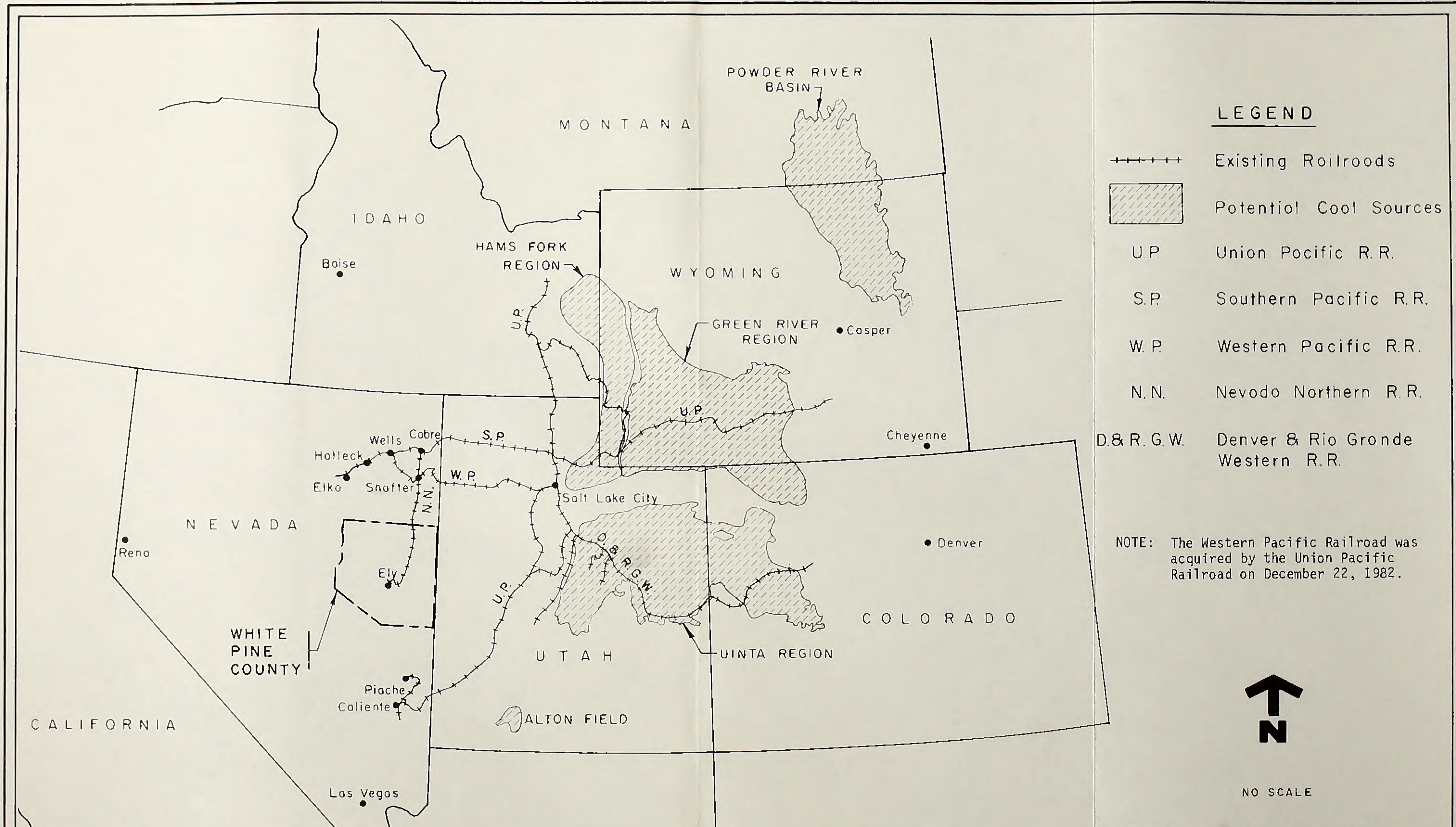


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

UTILITY CORRIDOR WATER SUPPLY SYSTEM

FIGURE 2-14

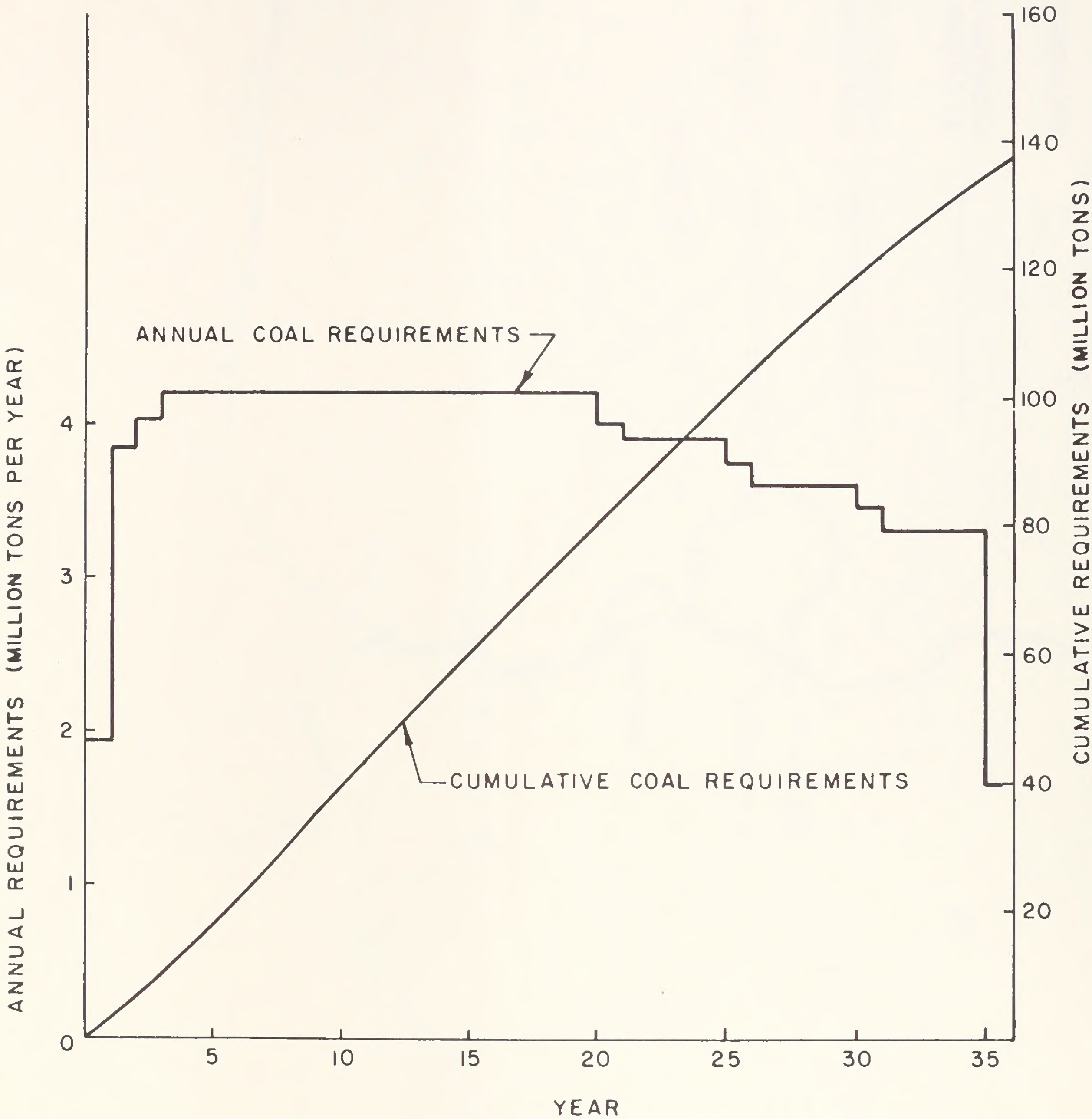


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

COAL SOURCES AND EXISTING RAILROAD SYSTEMS

FIGURE 2-15

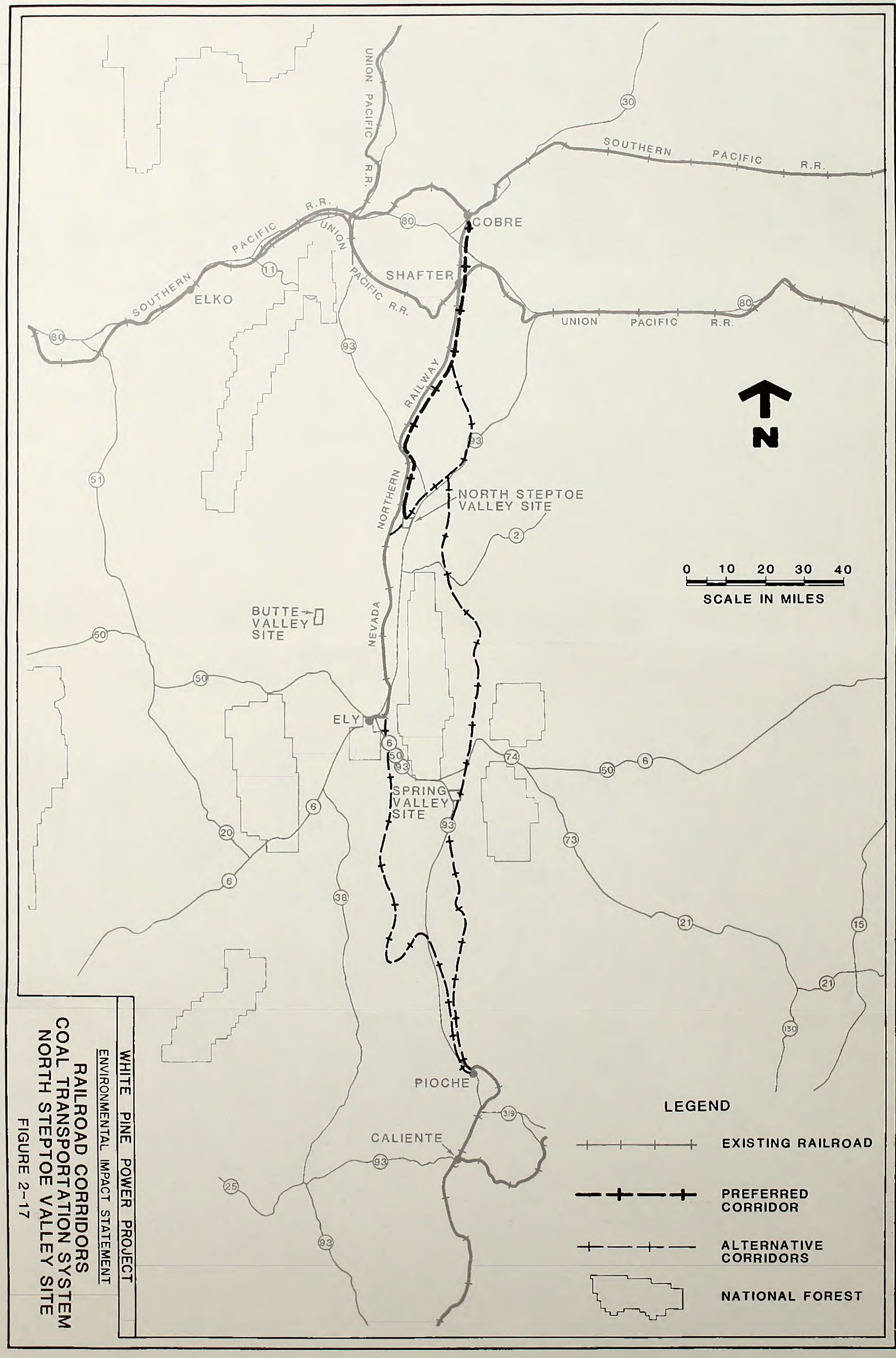


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

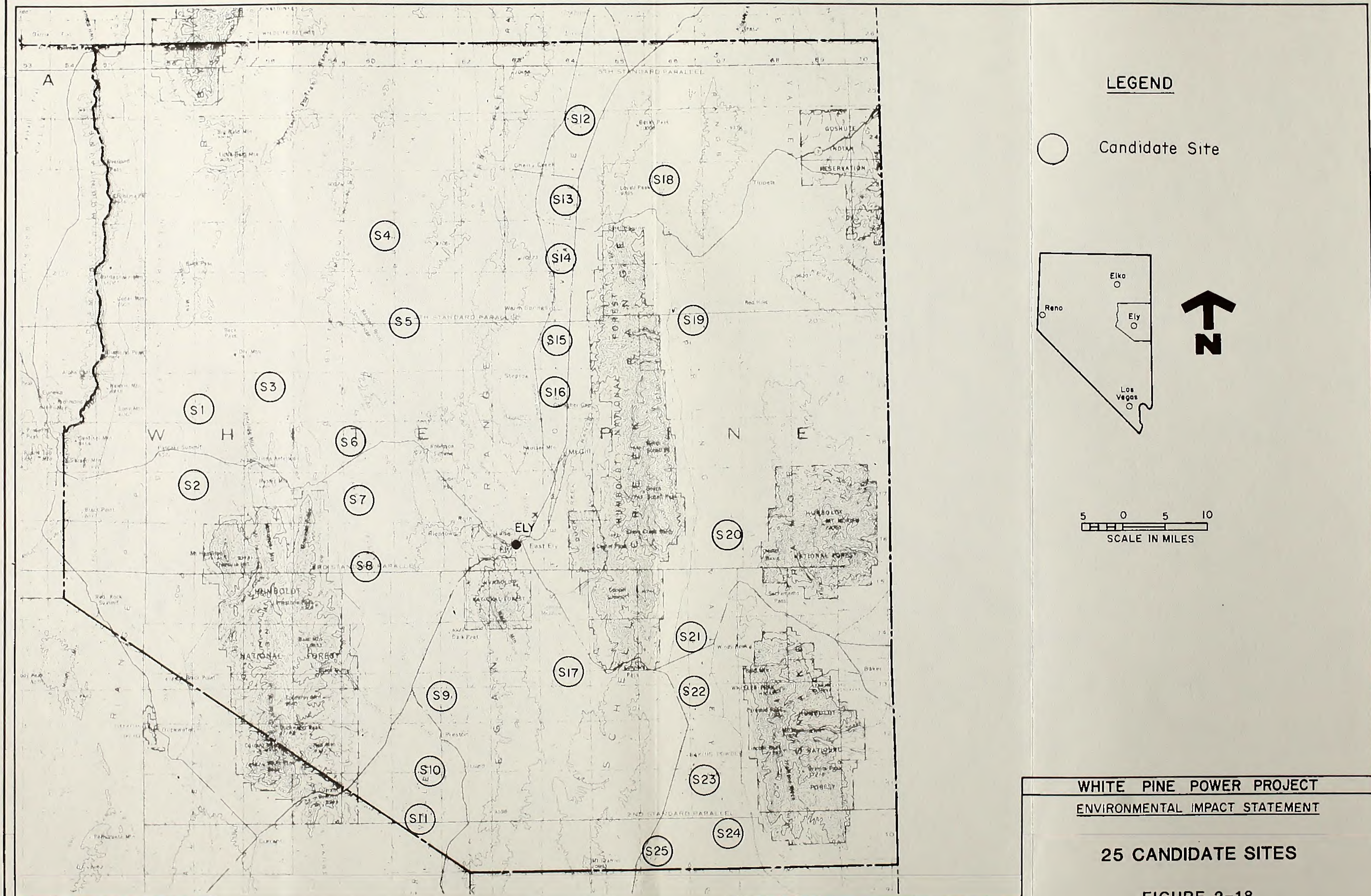
COAL REQUIREMENTS

FIGURE 2-16



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

RAILROAD CORRIDORS
COAL TRANSPORTATION SYSTEM
NORTH STEPTOE VALLEY SITE
FIGURE 2-17

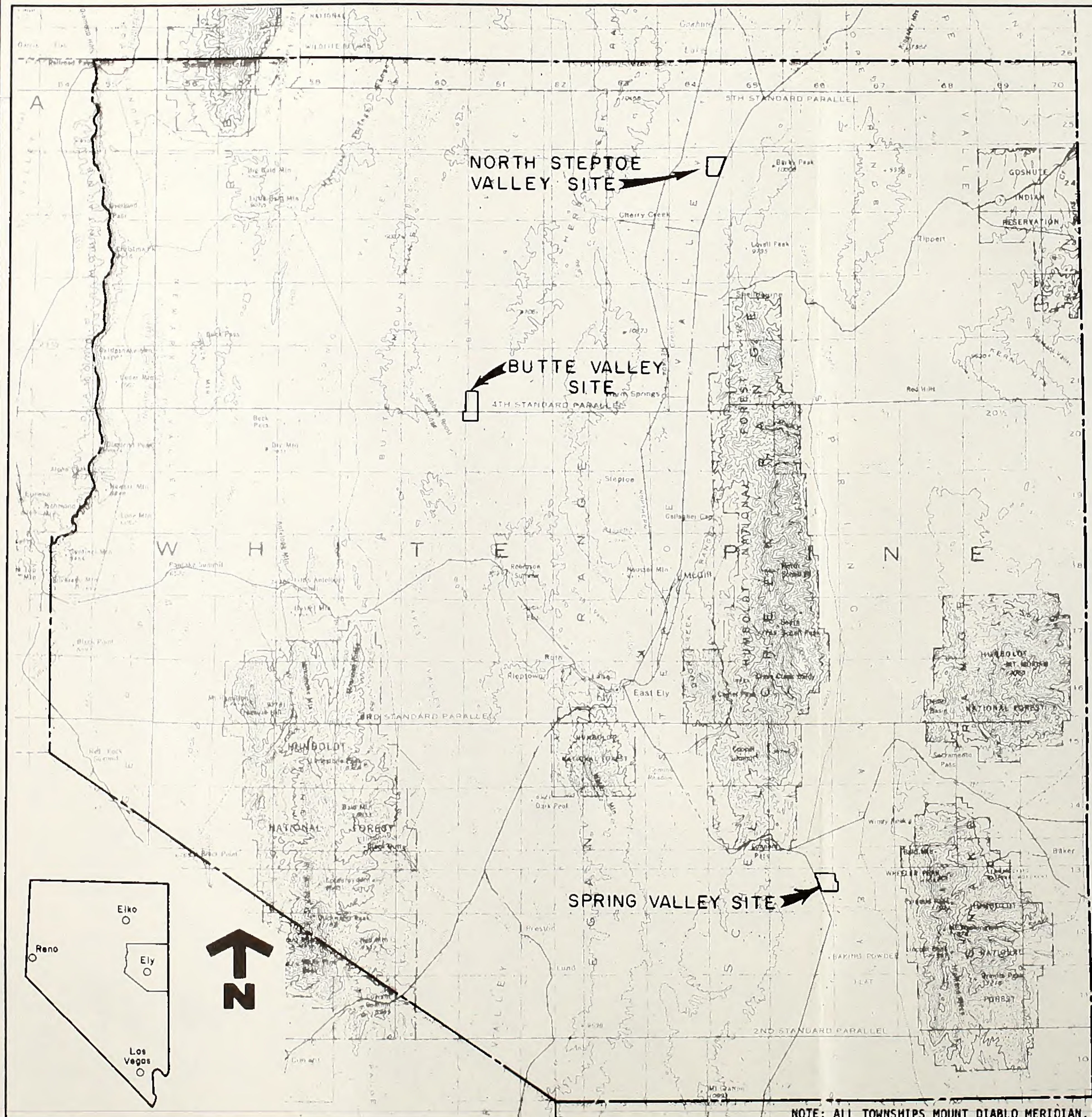


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

25 CANDIDATE SITES

FIGURE 2-18



LEGAL DESCRIPTION

BUTTE VALLEY SITE

TOWNSHIP 20 NORTH, RANGE 60 EAST – THE EAST $\frac{1}{2}$ OF THE NORTHEAST $\frac{1}{4}$ OF SECTION 1

TOWNSHIP 20 NORTH, RANGE 61 EAST – THE NORTH $\frac{1}{2}$ OF SECTION 5 AND NORTHWEST $\frac{1}{4}$ OF SECTION 6

TOWNSHIP 21 NORTH, RANGE 60 EAST – THE EAST $\frac{1}{2}$ OF SECTION 25 AND THE EAST $\frac{1}{2}$ OF SECTION 26

TOWNSHIP 21 NORTH, RANGE 61 EAST – THE WEST $\frac{1}{2}$ OF SECTION 30 AND THE WEST $\frac{1}{2}$ OF SECTION 31

NORTH STEPTOE VALLEY SITE

TOWNSHIP 24 NORTH, RANGE 64 EAST – SECTION 2, THE EAST $\frac{1}{2}$ OF SECTION 3 AND 10, AND THOSE PORTIONS OF SECTIONS 1, 11 AND 12 LYING WESTERLY OF THE WEST RIGHT-OF-WAY LINE OF U.S. HIGHWAY 93

SPRING VALLEY SITE

TOWNSHIP 13 NORTH, RANGE 66 EAST – SECTIONS 13 AND 24, AND THOSE PORTIONS OF SECTIONS 14, 15 AND 23 LYING EASTERLY OF THE EAST RIGHT-OF-WAY LINE OF U.S. HIGHWAY 93

TOWNSHIP 13 NORTH, RANGE 67 EAST – THE WEST $\frac{1}{2}$ OF THE WEST $\frac{1}{2}$ OF THE WEST $\frac{1}{2}$ OF SECTION 19, AND THE WEST $\frac{1}{2}$ OF THE EAST $\frac{1}{2}$ OF THE WEST $\frac{1}{2}$ OF SECTION 19

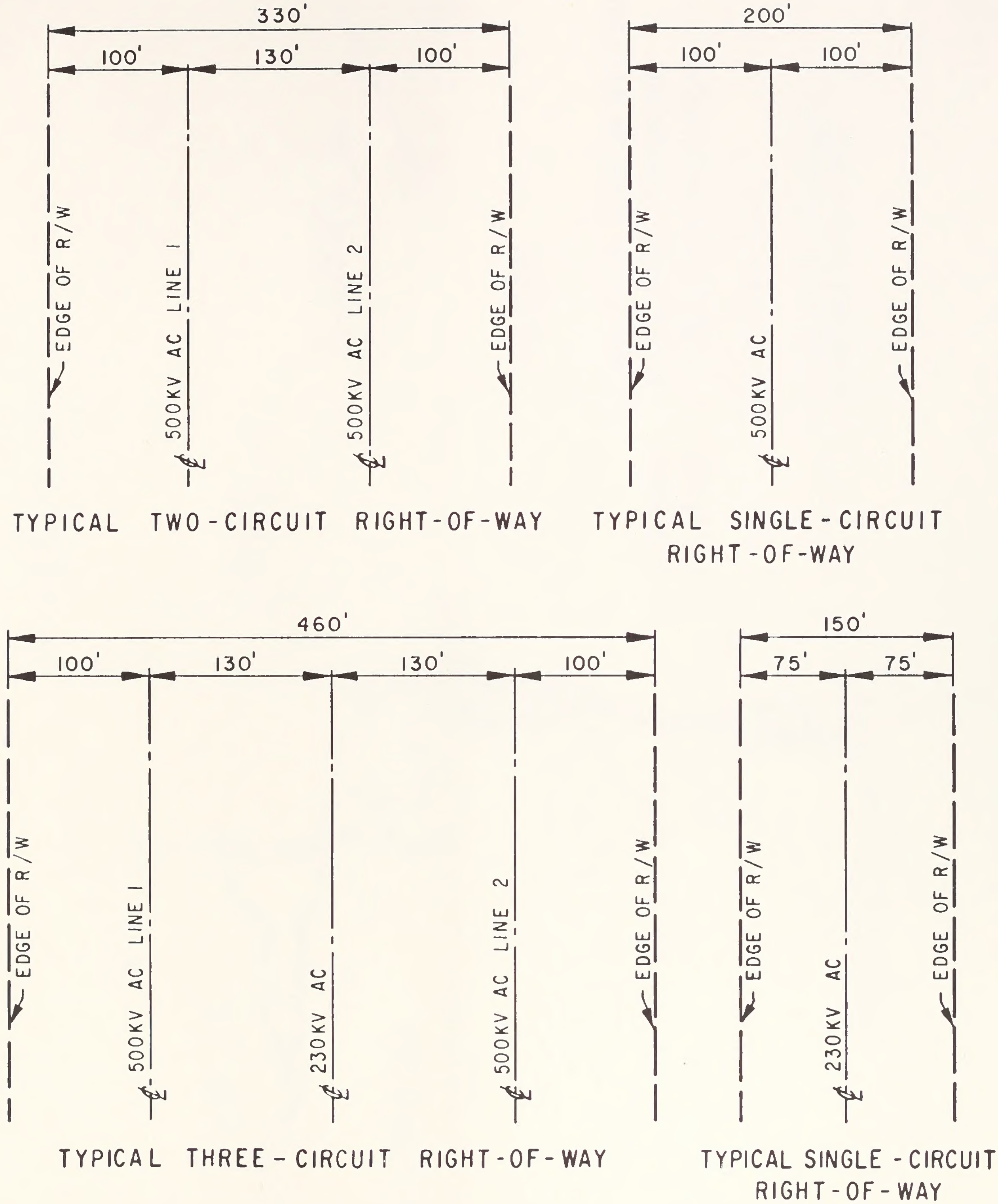
5 0 5 10
SCALE IN MILES

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

RECOMMENDED SITES

FIGURE 2-19

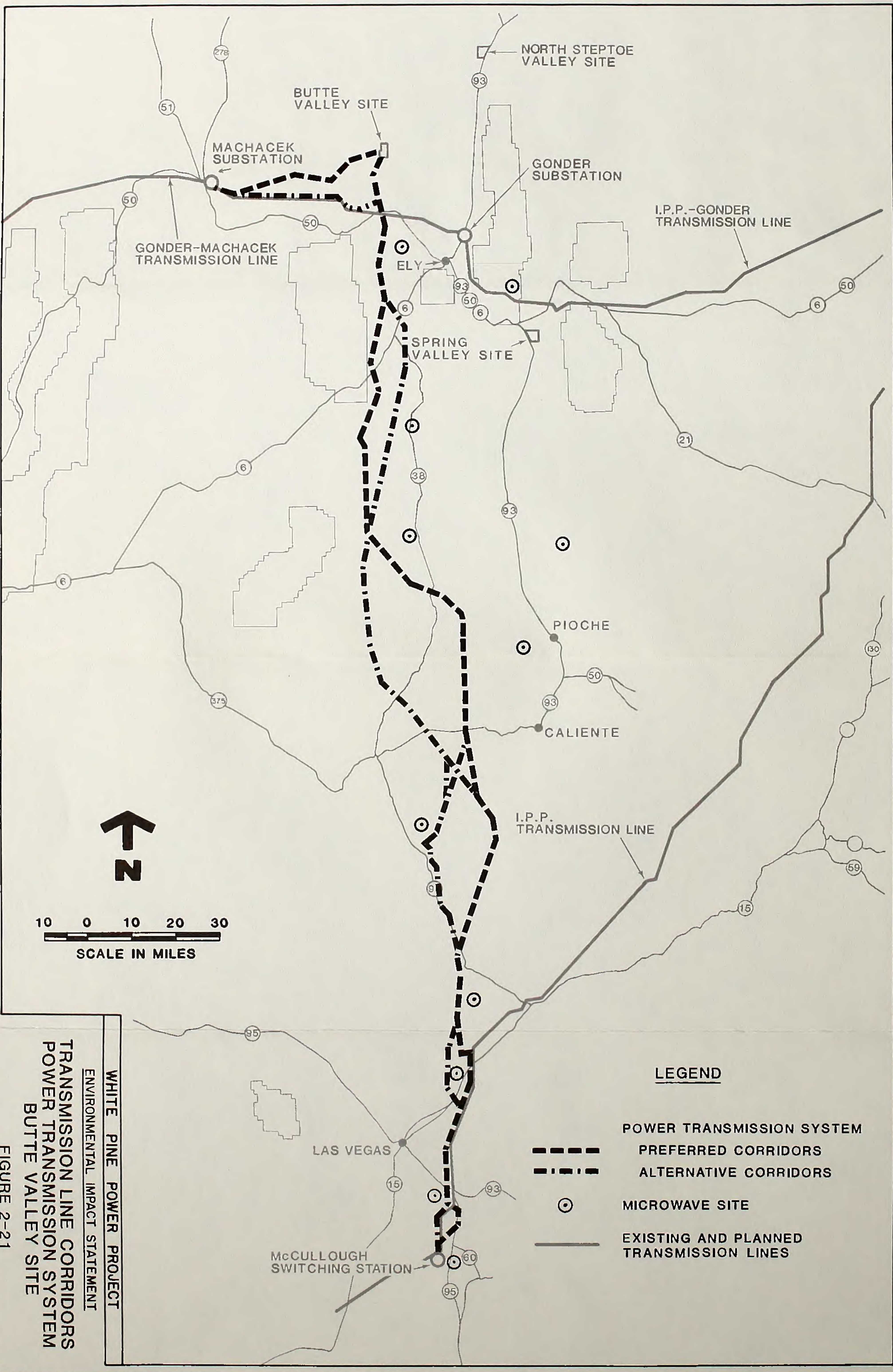


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

RIGHT-OF-WAY REQUIREMENTS POWER TRANSMISSION SYSTEM

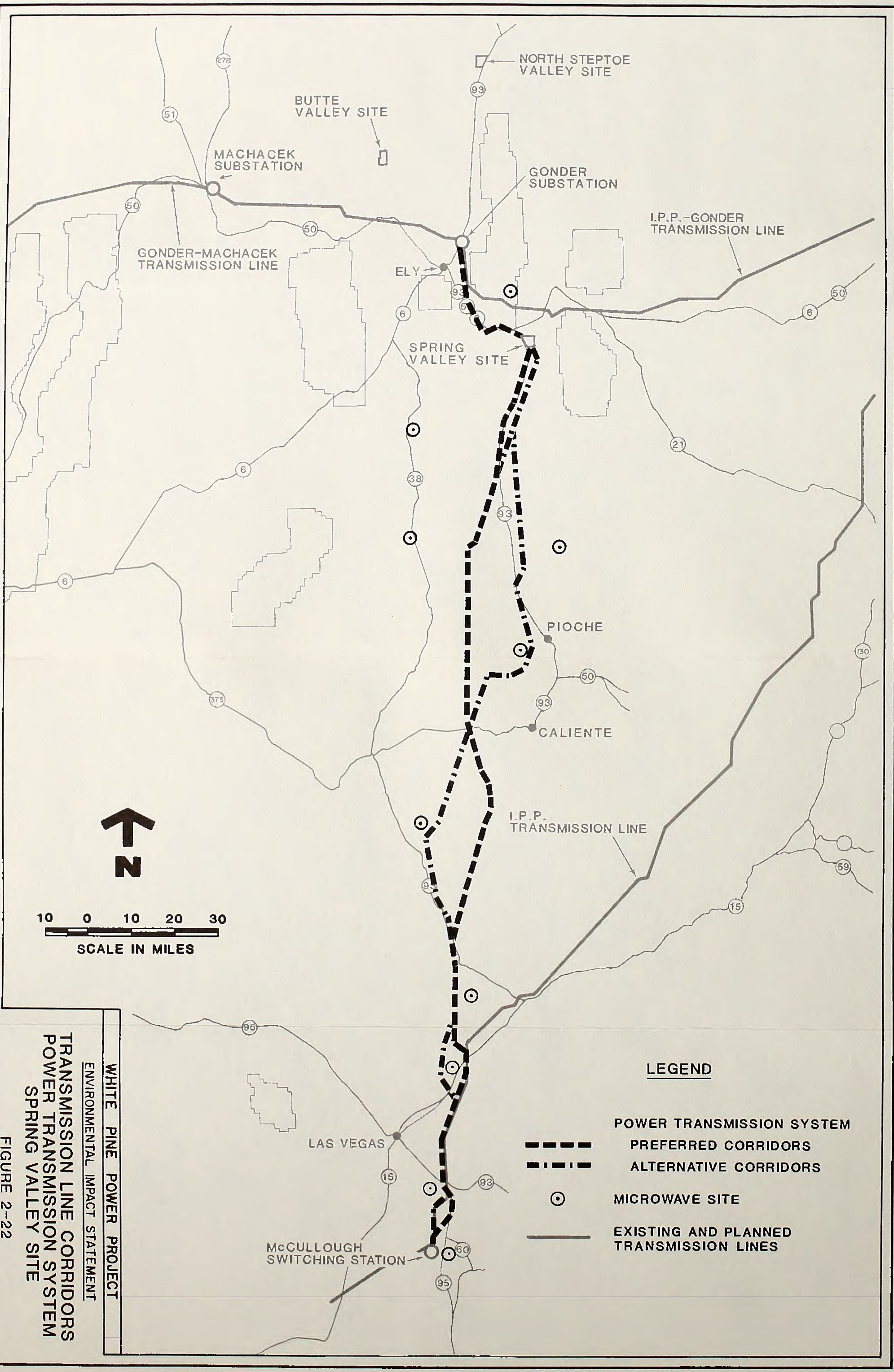
FIGURE 2-20



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

TRANSMISSION LINE CORRIDORS
POWER TRANSMISSION SYSTEM
BUTTE VALLEY SITE

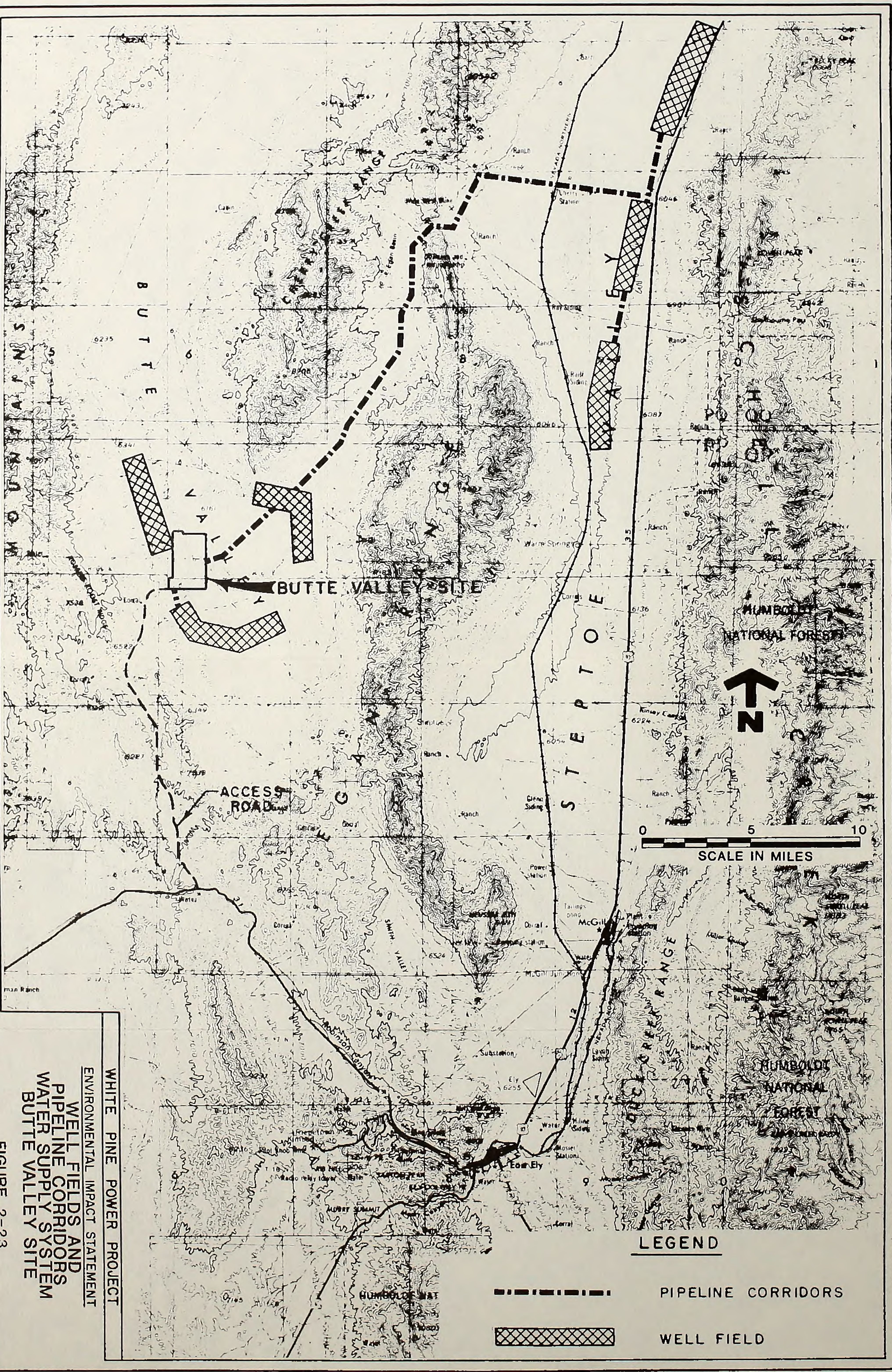
FIGURE 2-21



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

TRANSMISSION LINE CORRIDORS
POWER TRANSMISSION SYSTEM
SPRING VALLEY SITE

FIGURE 2-22



LEGEND

PIPELINE CORRIDORS

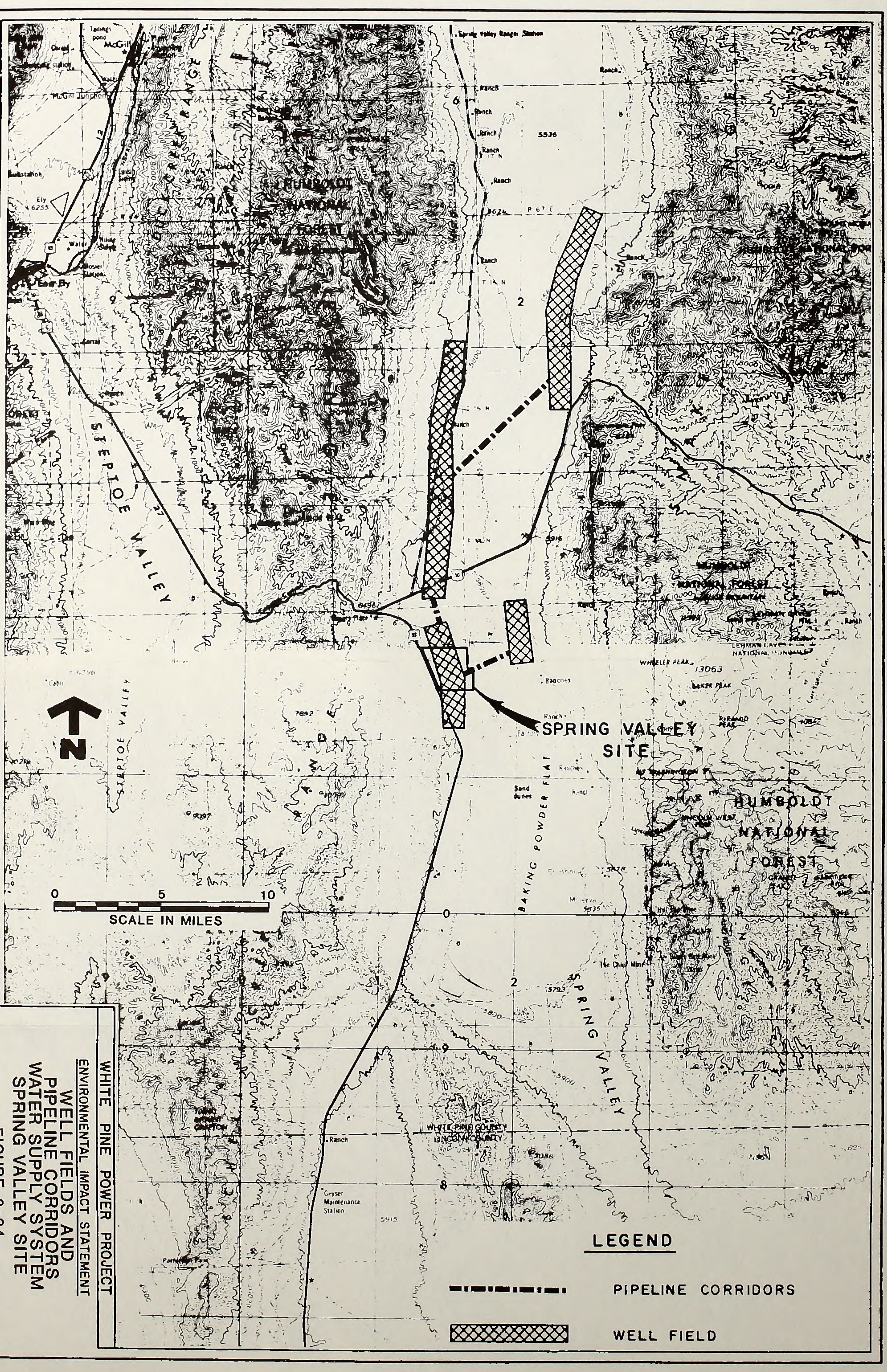
WELL FIELD

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

WELL FIELDS AND PIPELINE CORRIDORS WATER SUPPLY SYSTEM BUTTE VALLEY SITE

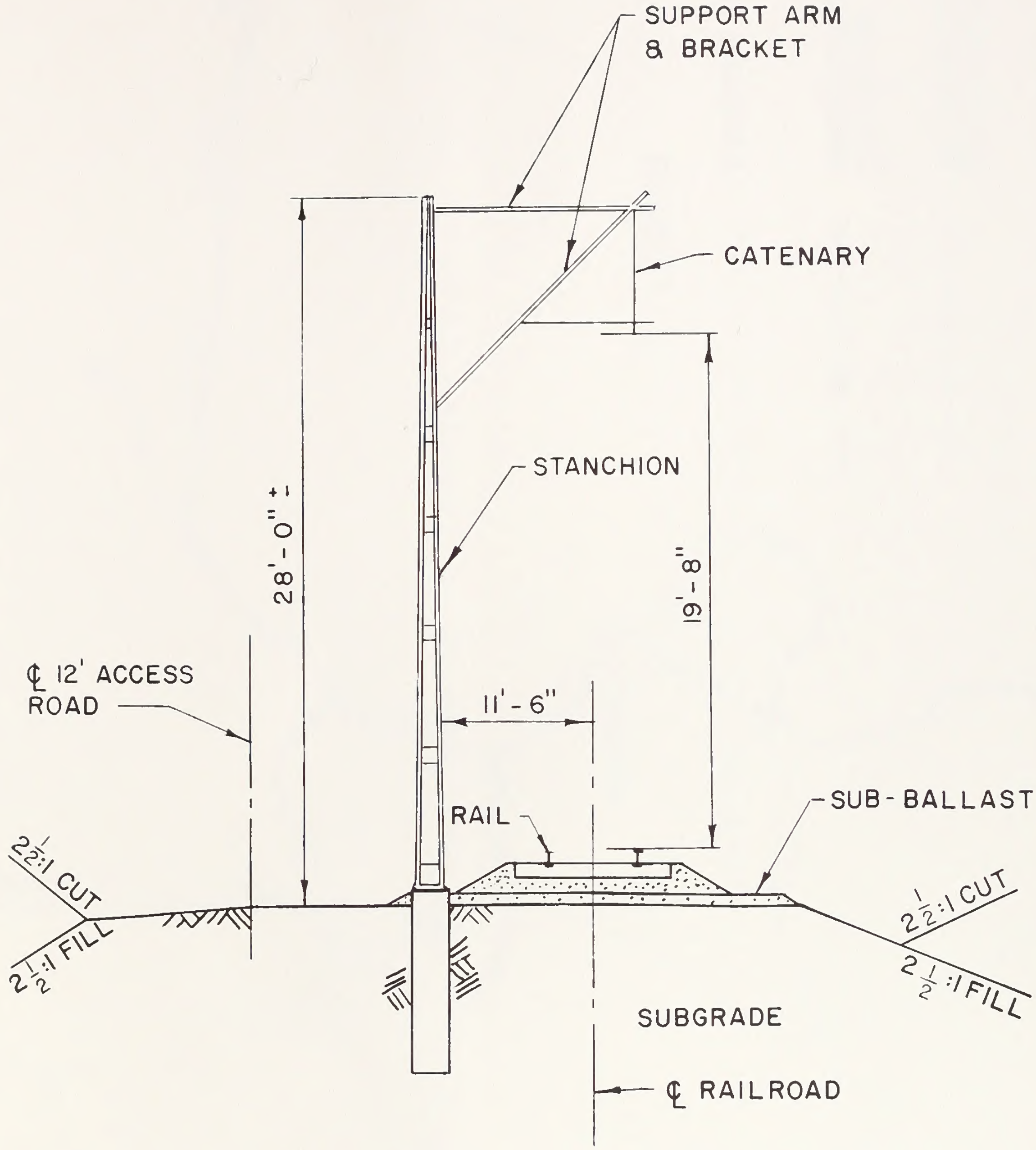
FIGURE 2-23



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

WELL FIELDS AND PIPELINE CORRIDORS WATER SUPPLY SYSTEM SPRING VALLEY SITE

FIGURE 2-24

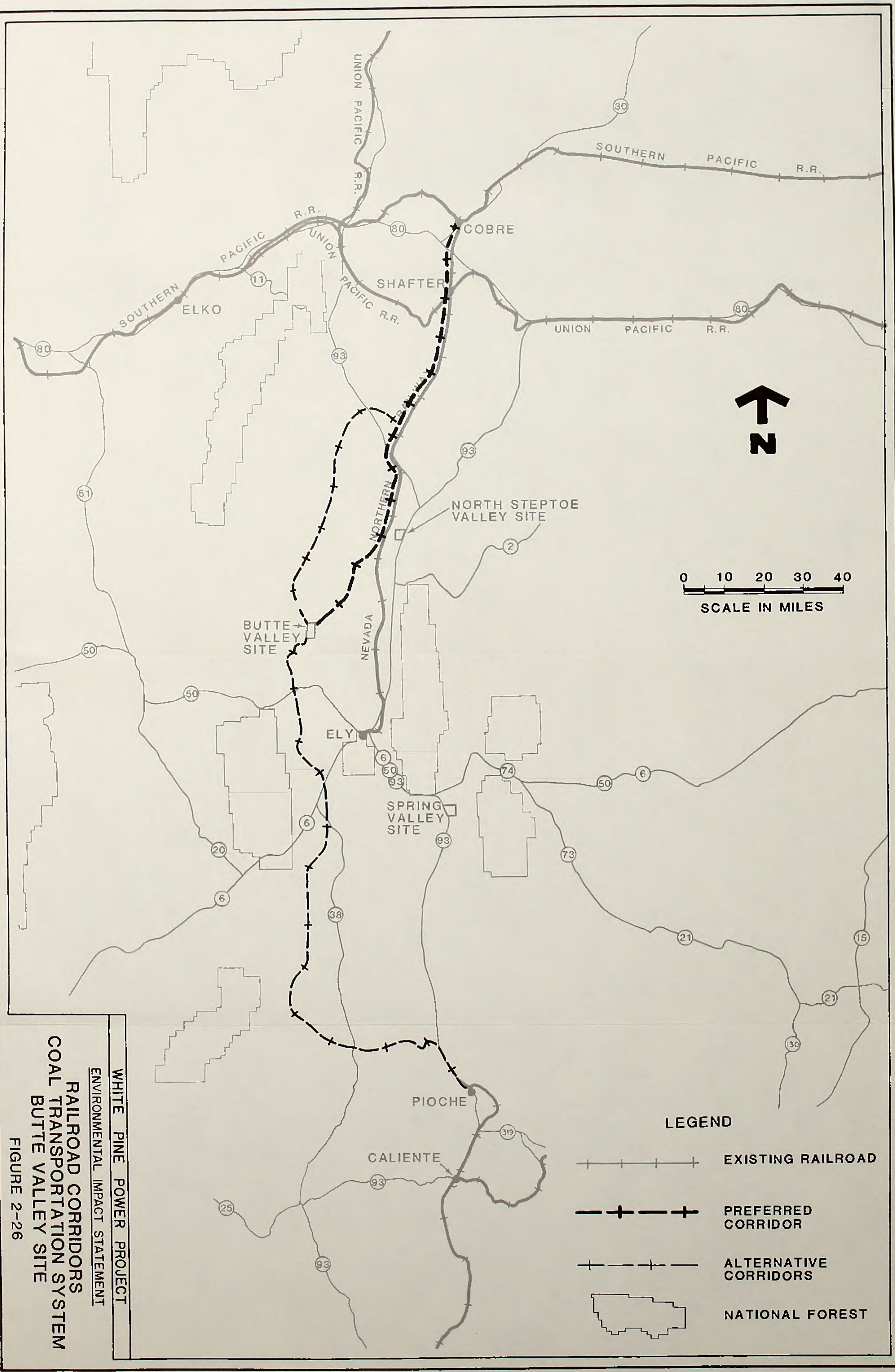


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

TYPICAL CROSS-SECTION ELECTRIFIED RAILROAD

FIGURE 2-25

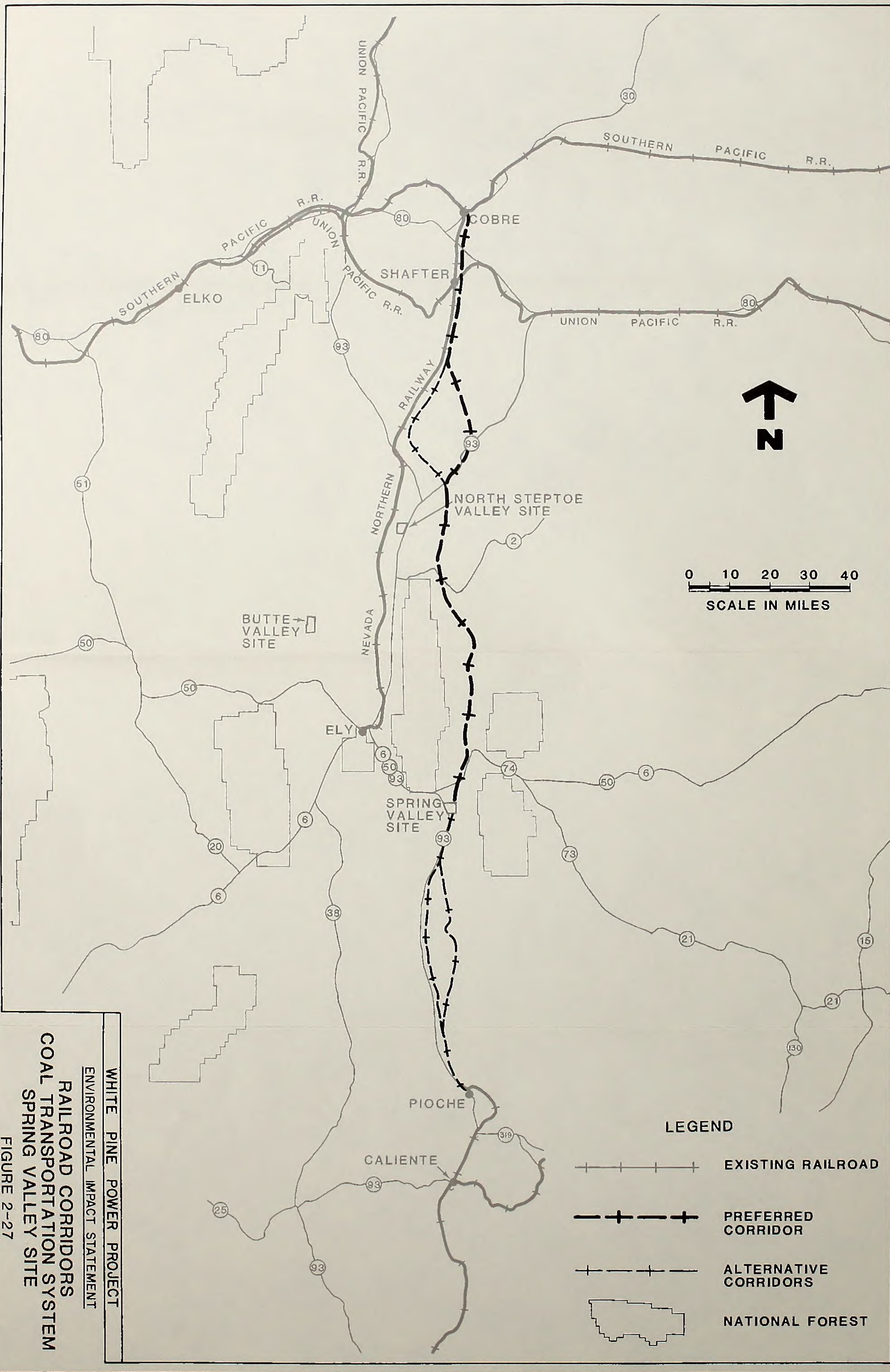


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

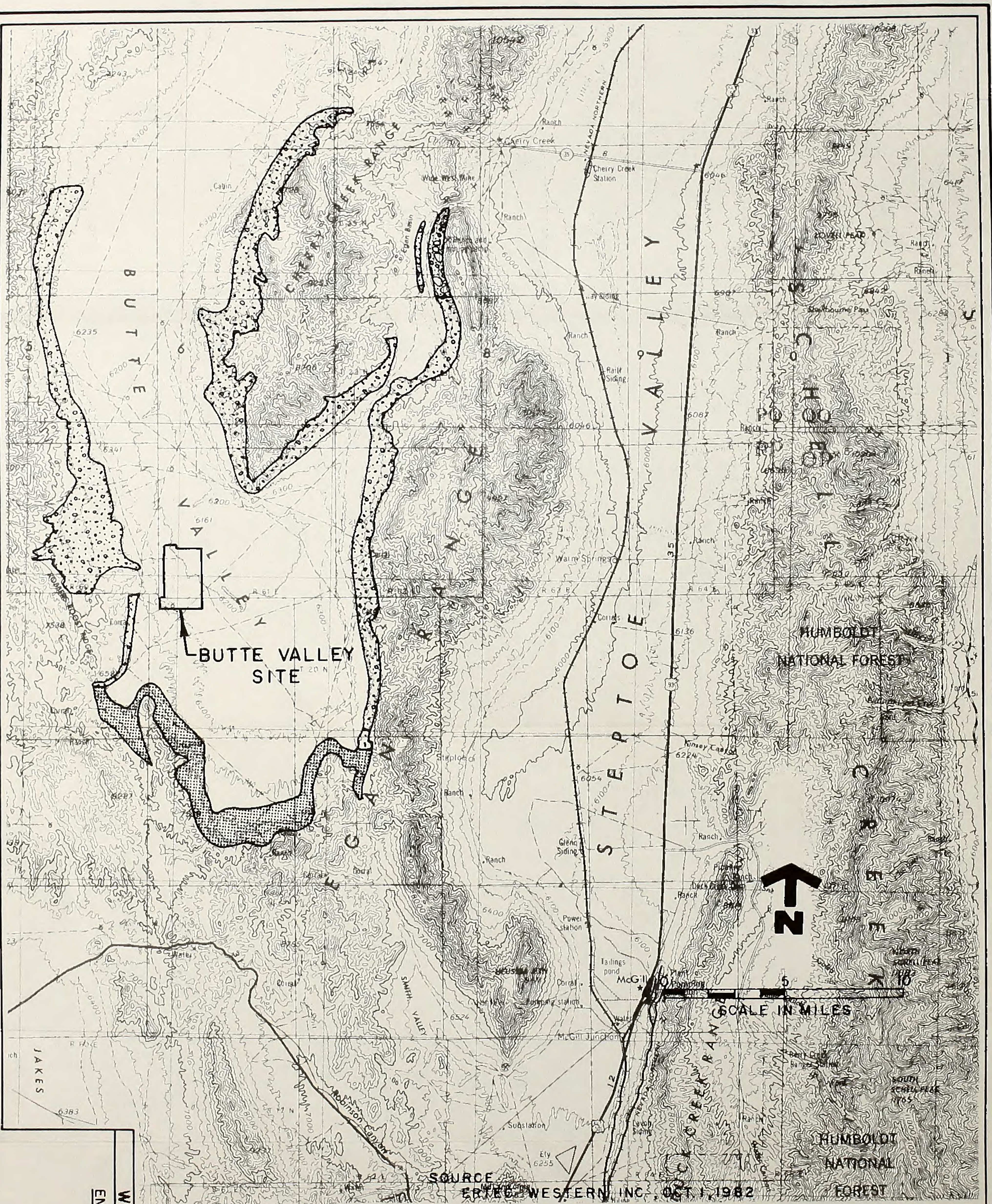
RAILROAD CORRIDORS
COAL TRANSPORTATION SYSTEM
BUTTE VALLEY SITE

FIGURE 2-26



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

RAILROAD CORRIDORS
COAL TRANSPORTATION SYSTEM
SPRING VALLEY SITE
FIGURE 2-27



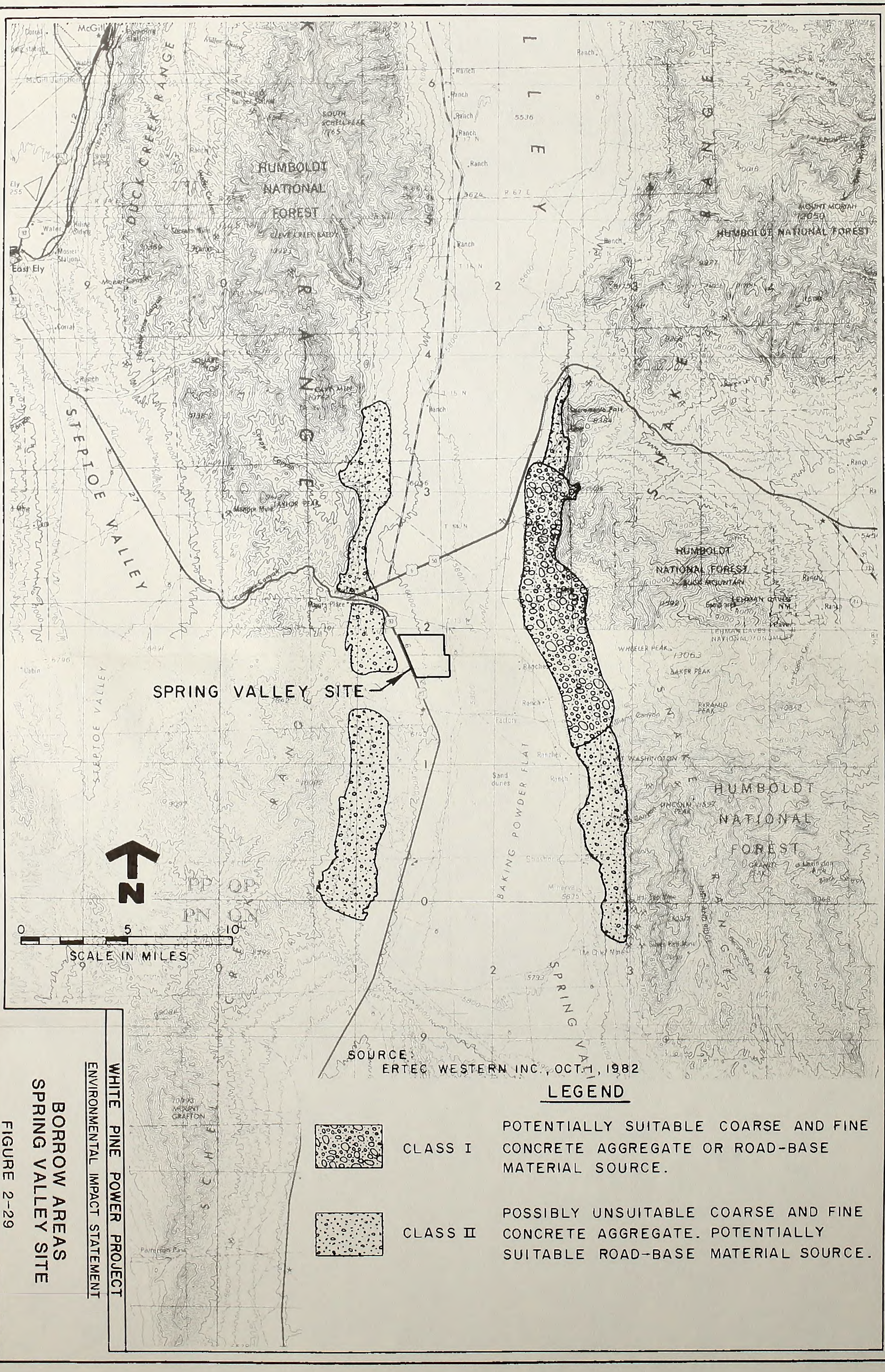
LEGEND

	CLASS I	POTENTIALLY SUITABLE COARSE AND FINE CONCRETE AGGREGATE OR ROAD-BASE MATERIAL SOURCE.
	CLASS II	POSSIBLY UNSUITABLE COARSE AND FINE CONCRETE AGGREGATE. POTENTIALLY SUITABLE ROAD-BASE MATERIAL SOURCE.
	CLASS III	PROBABLY UNSUITABLE COARSE AND FINE CONCRETE AGGREGATE OR POSSIBLY UNSUITABLE ROAD-BASE MATERIAL.

WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

BORROW AREAS
BUTTE VALLEY SITE

FIGURE 2-28



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

BORROW AREAS
SPRING VALLEY SITE

FIGURE 2-29

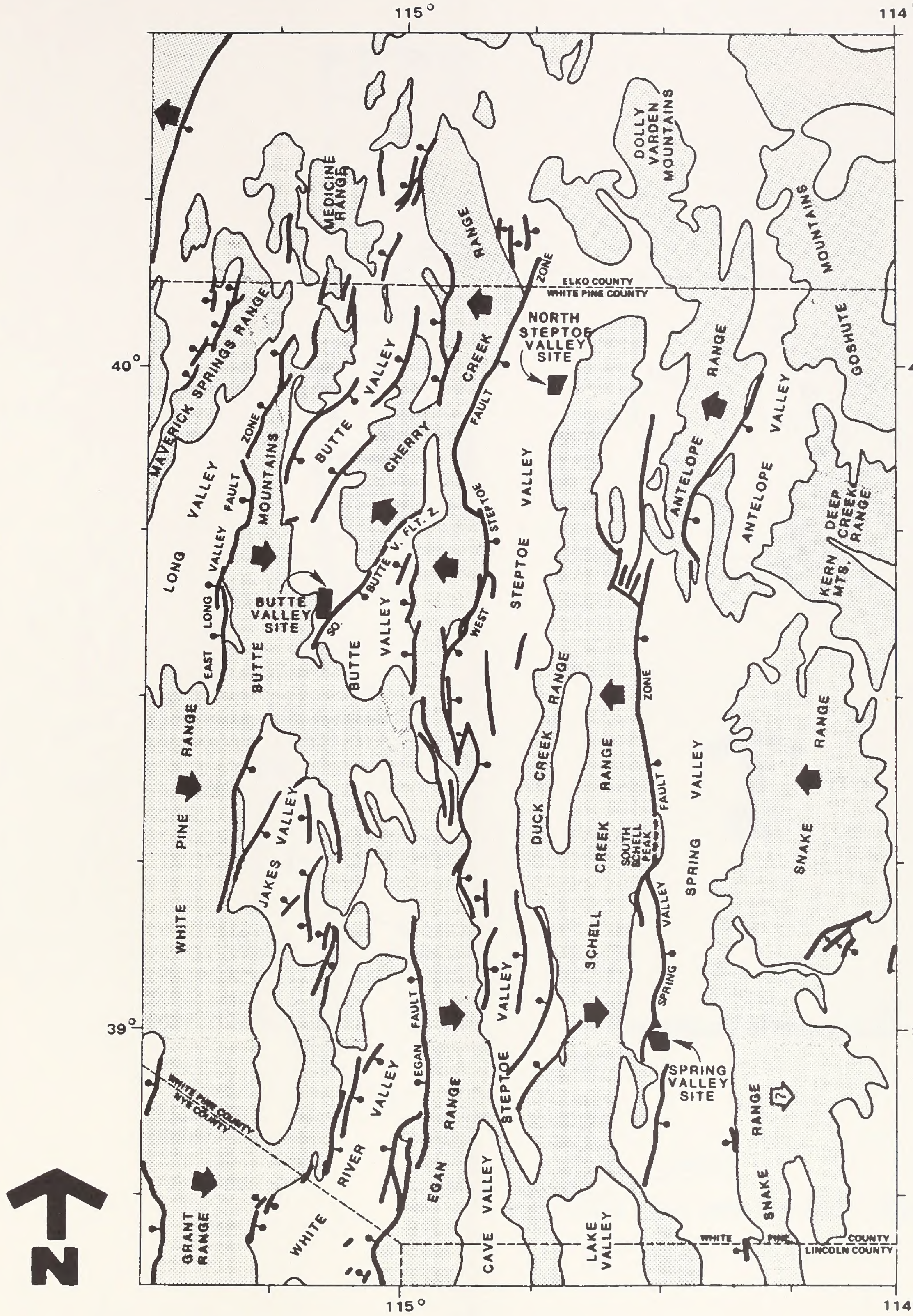
RELATIVE GEOLOGIC TIME				TIME (MILLIONS OF YEARS)
ERA	PERIOD		EPOCH	
CENOZOIC	QUATERNARY		HOLOCENE	
			PLEISTOCENE	2-3
	TERTIARY		PLIOCENE	12
			MIOCENE	26
			OLIGOCENE	37-38
			EOCENE	53-54
			PALEOCENE	65
MESOZOIC	CRETACEOUS		LATE EARLY	136
	JURASSIC		LATE MIDDLE EARLY	190-195
	TRIASSIC		LATE MIDDLE EARLY	225
PALEOZOIC	PERMIAN		LATE EARLY	280
	CARBON-IFEROUS	PENNSYLVANIAN	LATE MIDDLE EARLY	
		MISSISSIPPIAN	LATE EARLY	345
	DEVONIAN		LATE MIDDLE EARLY	395
	SILURIAN		LATE MIDDLE EARLY	430-440
	ORDOVICIAN		LATE MIDDLE EARLY	500
	CAMBRIAN		LATE MIDDLE EARLY	570
PRECAMBRIAN				3,600+

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

GEOLOGIC TIME SCALE

FIGURE 3-1



LEGEND

MAJOR LATE QUATERNARY FAULT; TICK MARK INDICATES DOWNDROPPED BLOCK.

DIRECTION OF LATE CENOZOIC TILT OF MOUNTAIN BLOCK

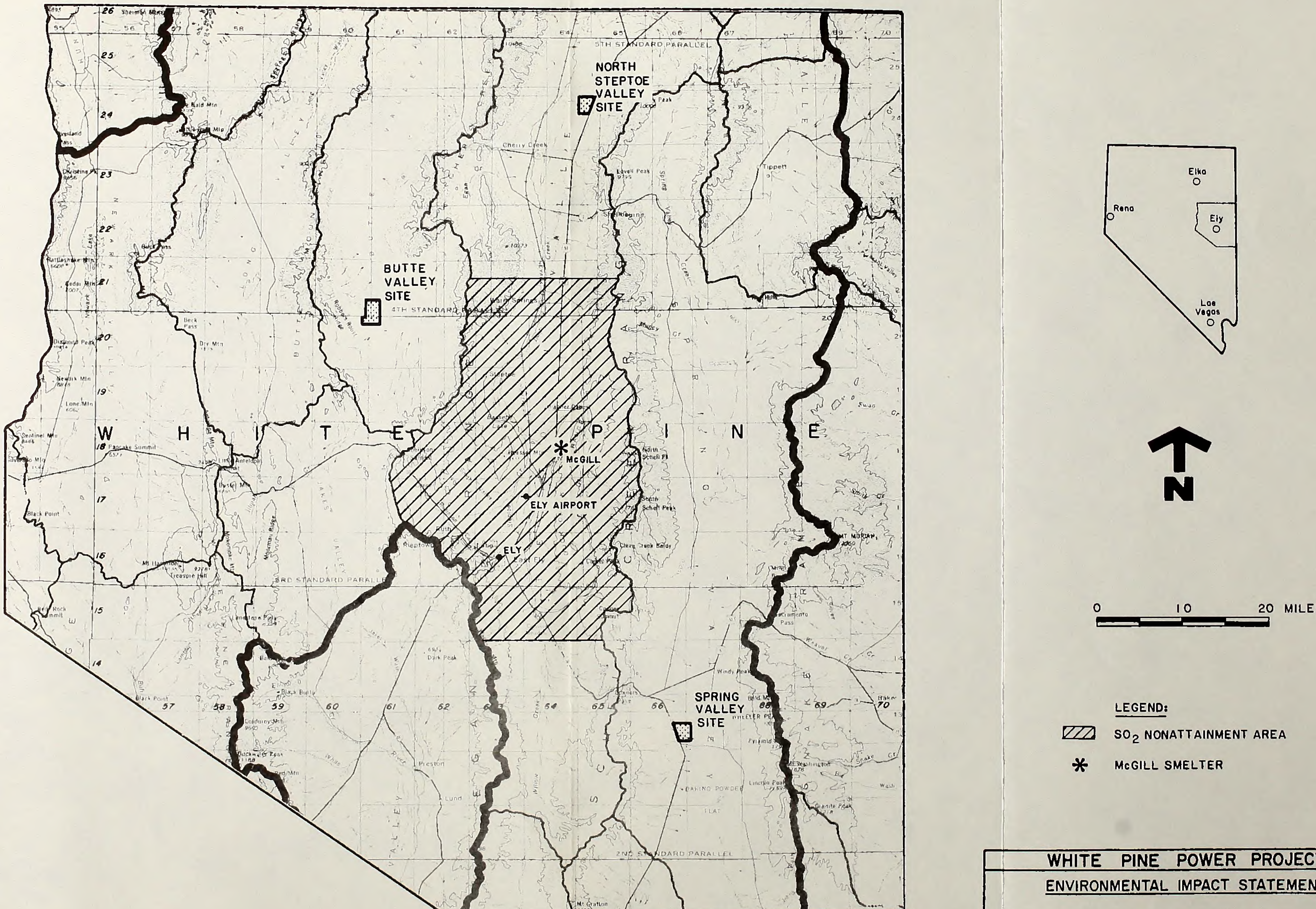
10 5 0 10 20 MILES

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

REGIONAL TECTONIC MAP

FIGURE 3-2

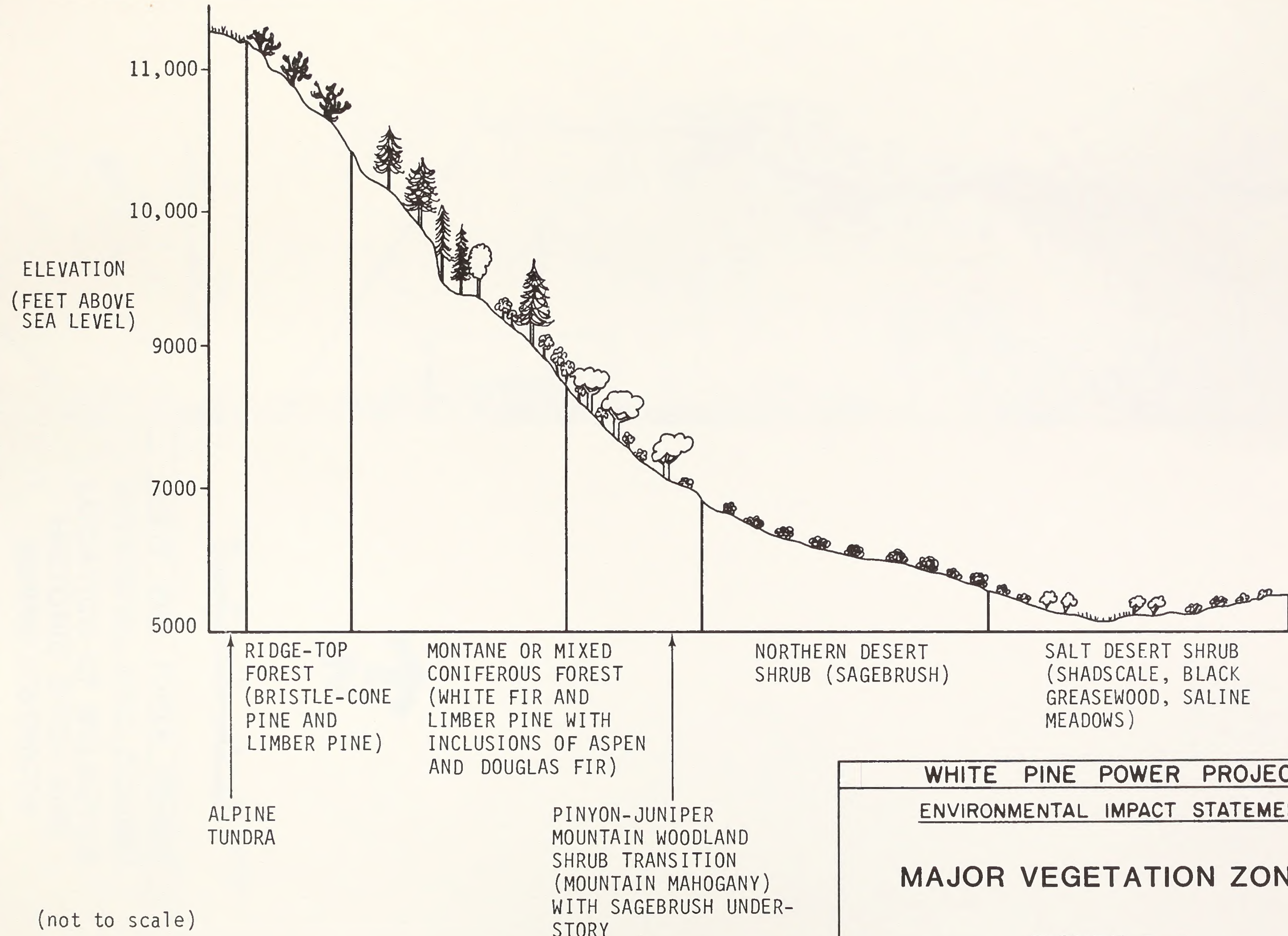


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

SULFUR DIOXIDE NONATTAINMENT AREA

FIGURE 3-3

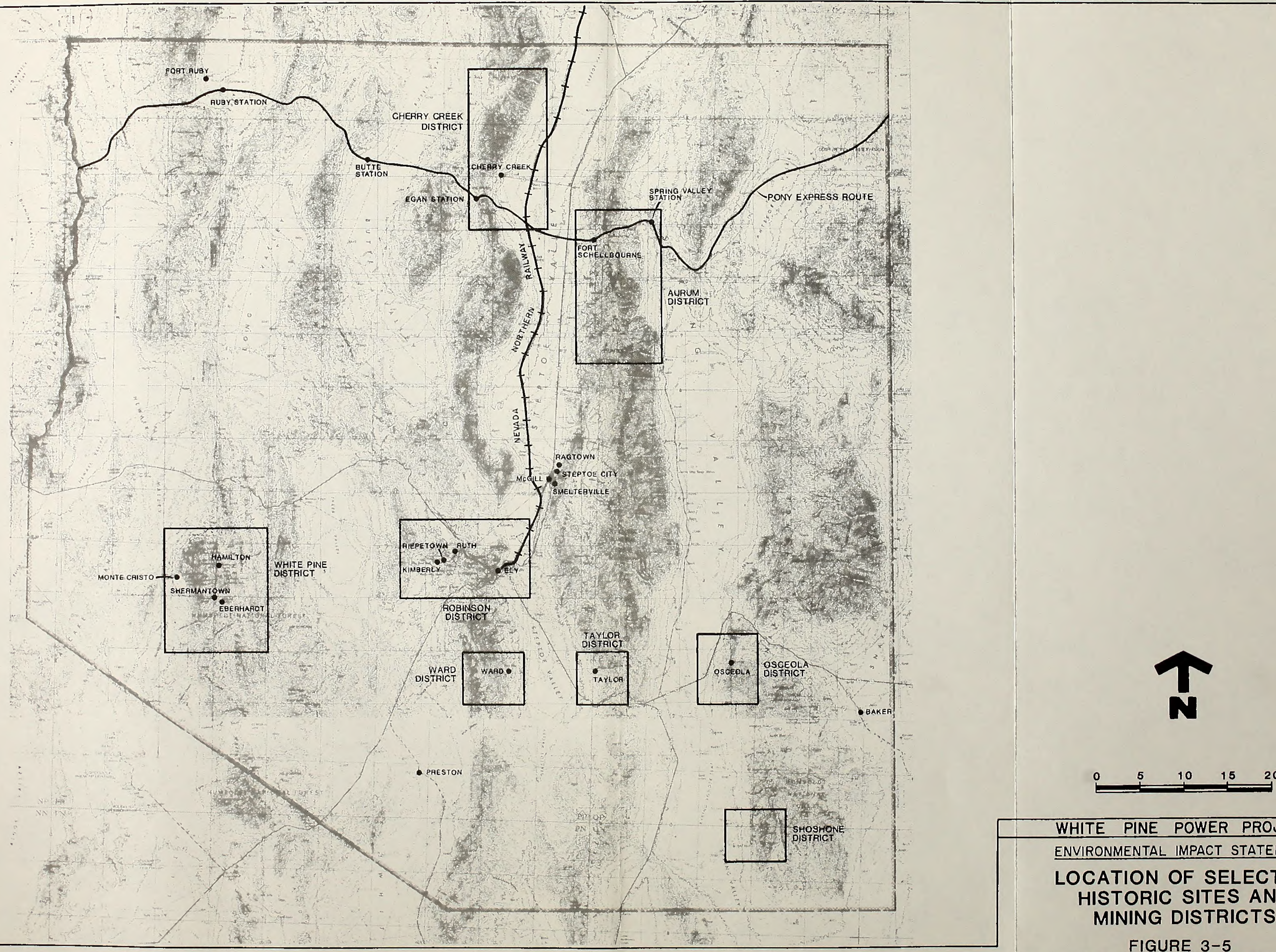


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

MAJOR VEGETATION ZONES

FIGURE 3-4

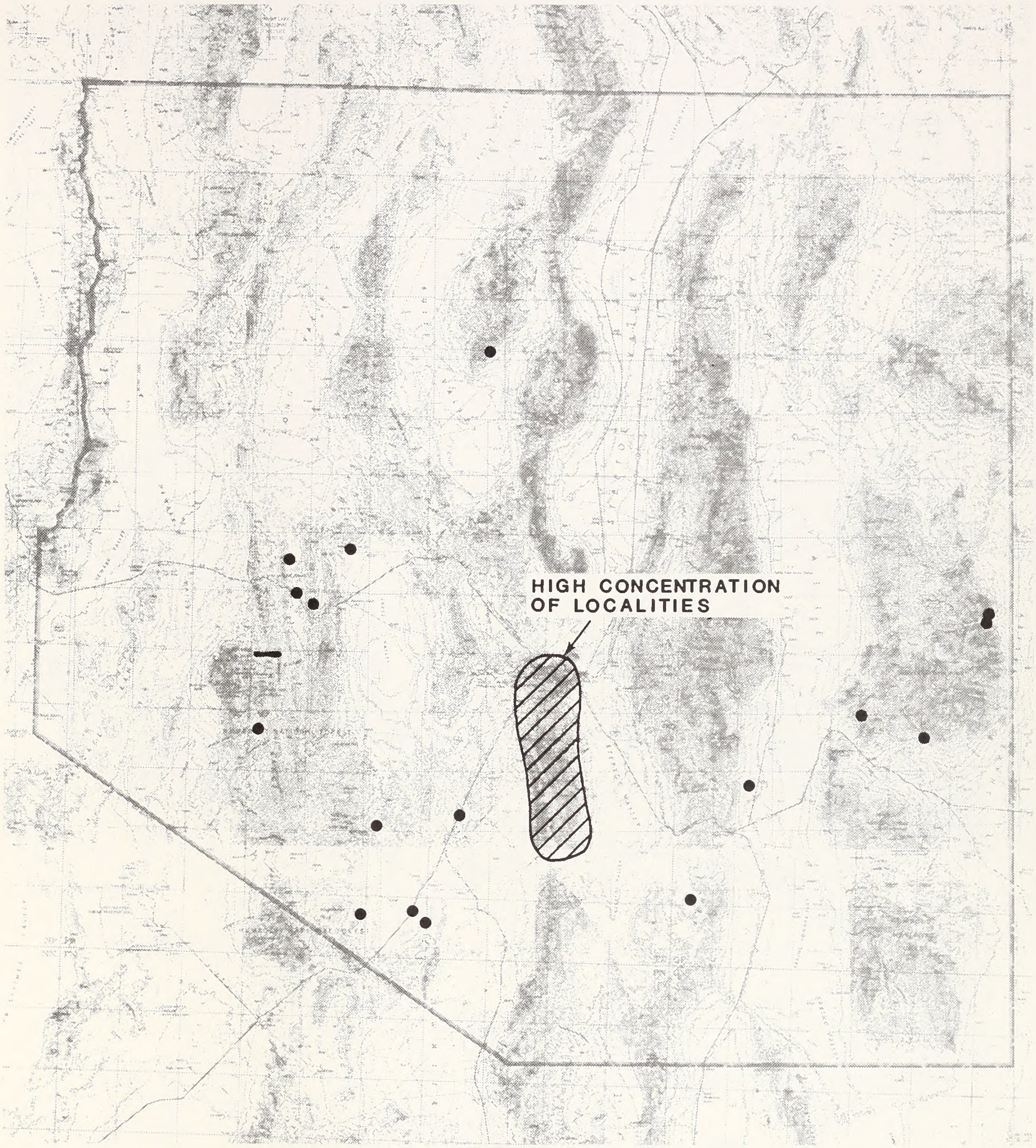


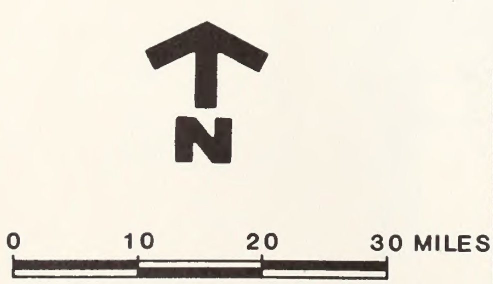
WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

LOCATION OF SELECTED HISTORIC SITES AND MINING DISTRICTS

FIGURE 3-5





WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

PALEONTOLOGICAL LOCALITIES

FIGURE 3-6

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

REGIONAL LANDSCAPE CONDITIONS

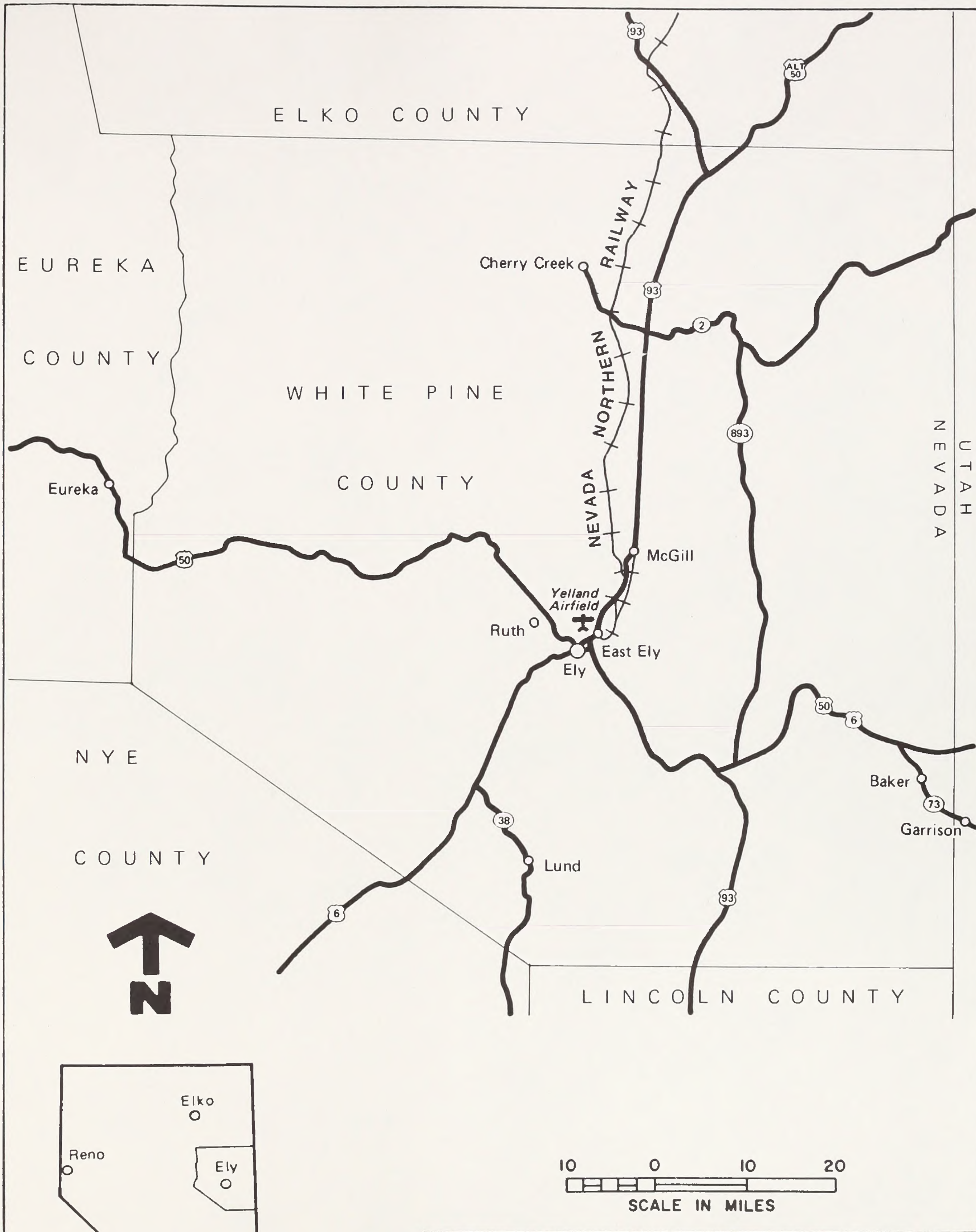
FIGURE 3-7

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

BLM VISUAL RESOURCE MANAGEMENT CLASSES

FIGURE 3-8

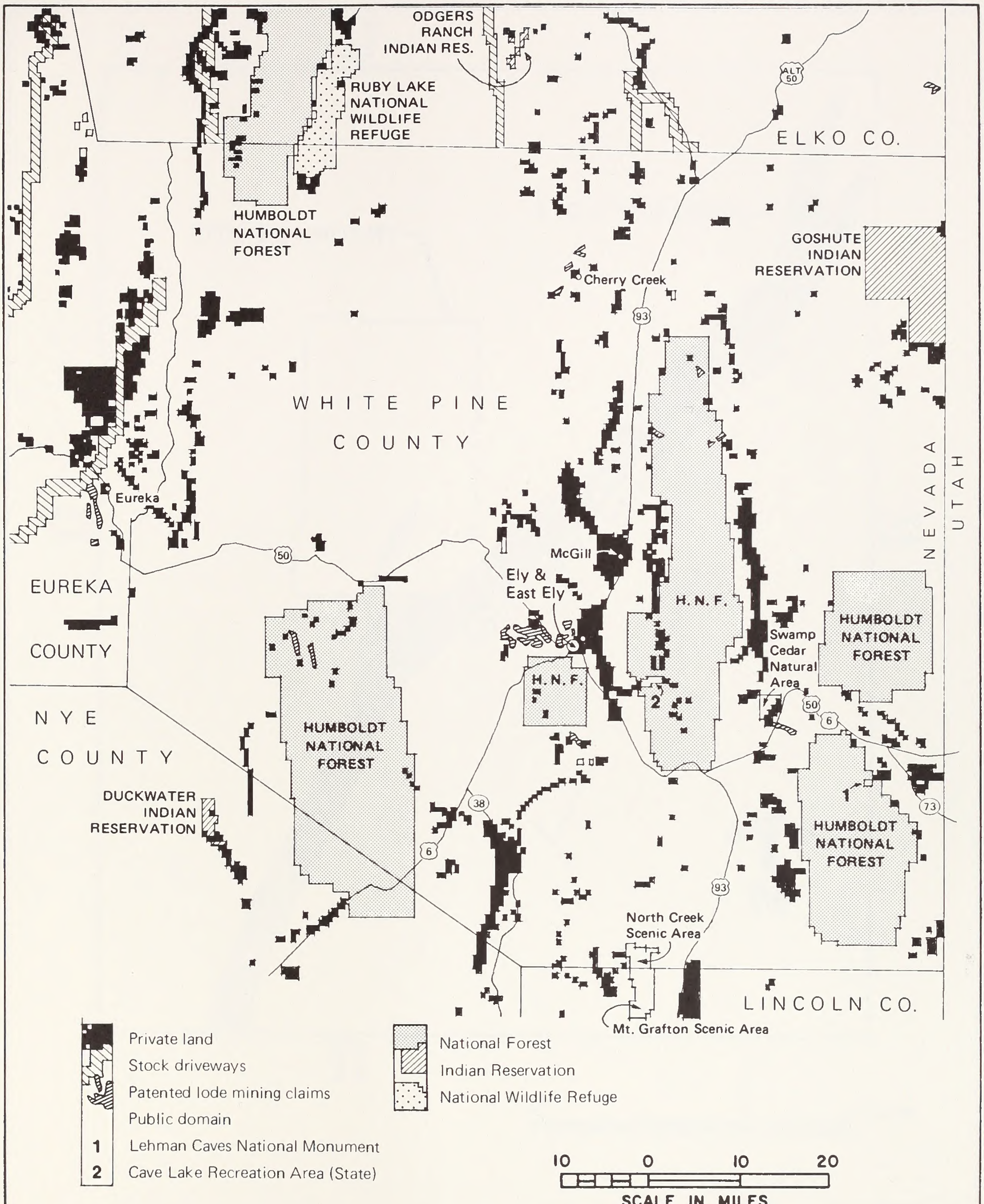


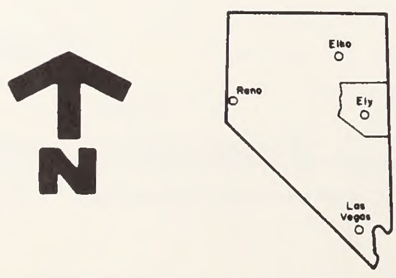
WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

MAJOR ROADS WHITE PINE COUNTY

FIGURE 3-9



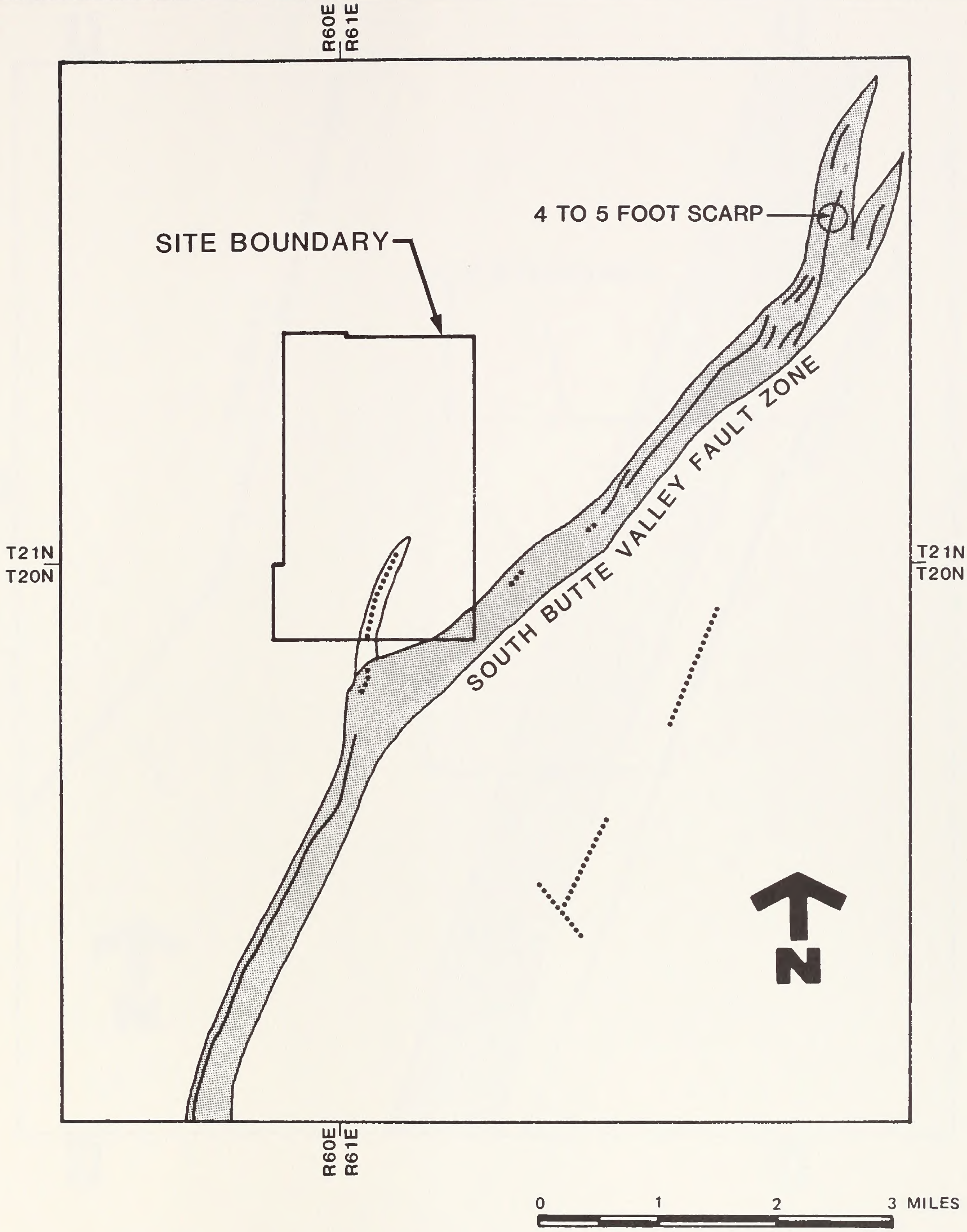


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

LAND STATUS
WHITE PINE COUNTY

FIGURE 3-10



LEGEND

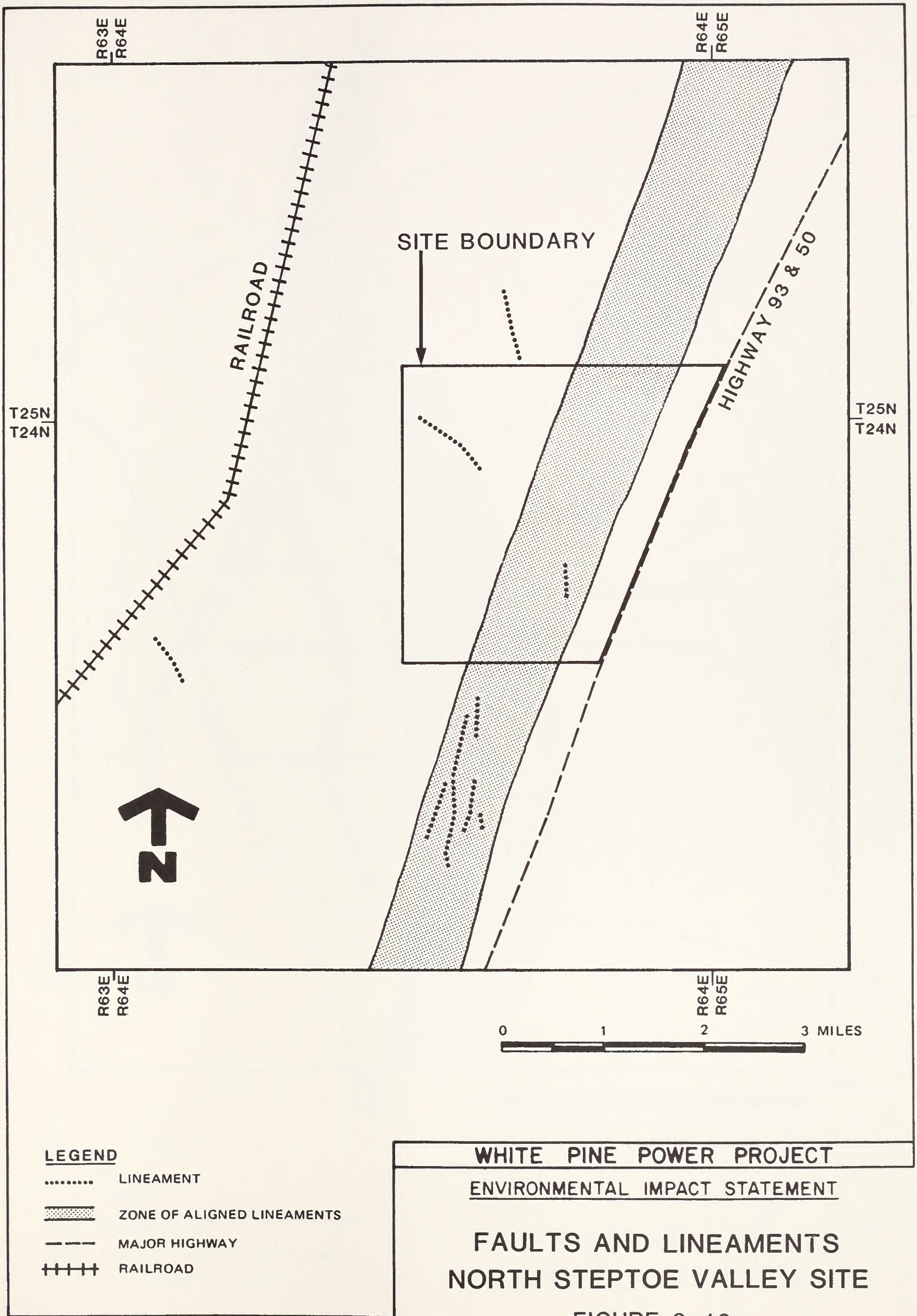
- FAULT
- LINEAMENT
- MAIN ZONE OF HOLOCENE/ LATE PLEISTOCENE SURFACE FAULTING
- POSSIBLE ZONE OF SPLAY FAULT

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

FAULTS AND LINEAMENTS
BUTTE VALLEY SITE

FIGURE 3-11

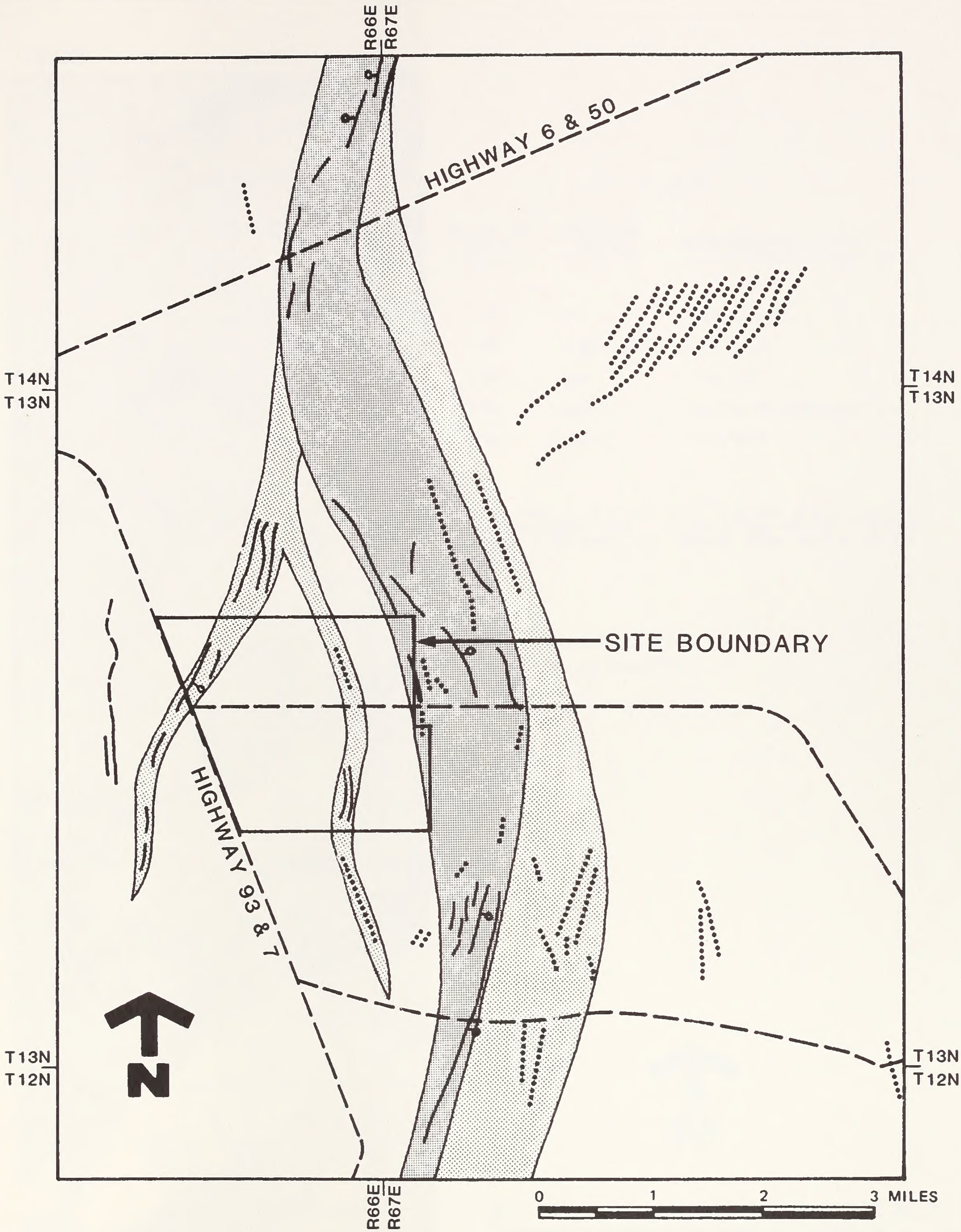


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

FAULTS AND LINEAMENTS
NORTH STEPTOE VALLEY SITE

FIGURE 3-12



LEGEND

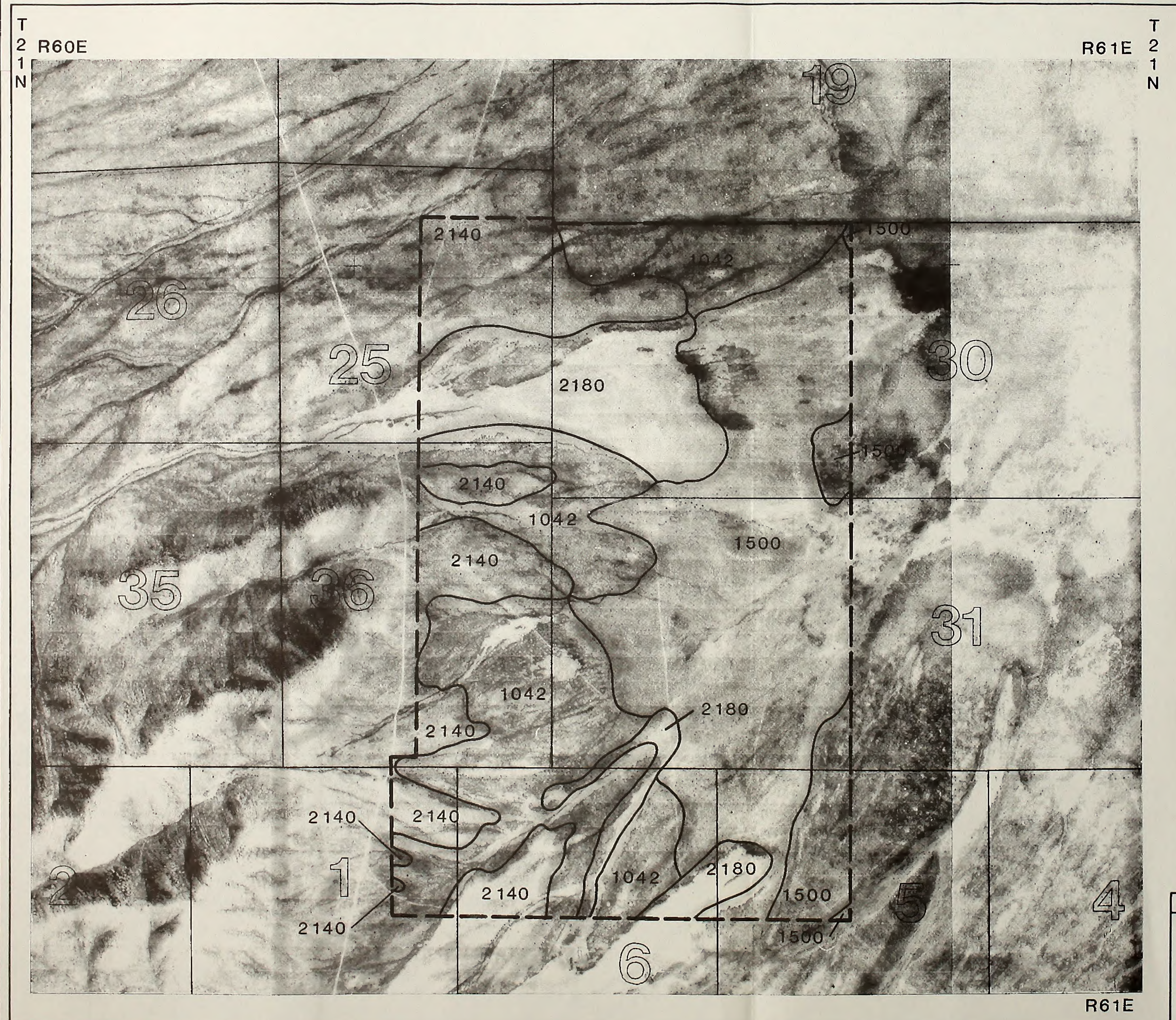
- FAULT
- LINEAMENT
- MAIN ZONE OF HOLOCENE/LATE PLEISTOCENE SURFACE FAULTING
- ZONE OF LATE PLEISTOCENE SPLAY FAULTS
- MAJOR HIGHWAYS AND ROADS

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

FAULTS AND LINEAMENTS
SPRING VALLEY SITE

FIGURE 3-13



LEGEND

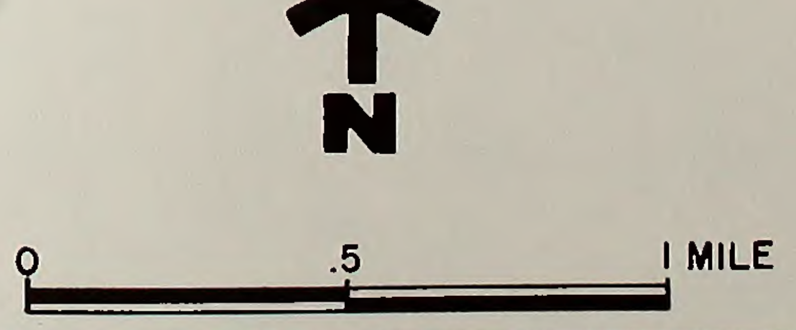
MAPPING UNIT NUMBER	MAJOR SOIL SERIES	MAJOR ECOLOGICAL SITES[a]
1042	Oupico	Loamy 8-10
1500	81imo-Uwell	Loamy 8-10
1500	Raph	Loamy 5-8
2140	Ursine	Shallow Calcareous Loam 8-12
2180	Lusetti	Silty 8-10

a Unless noted by (%), over 80% of the mapping unit is the listed ecological site. The percentages are the estimated occurrences of ecological sites and other lands within the mapping unit.

Source:

U.S. Soil Conservation Service

U.S. Bureau of Land Management

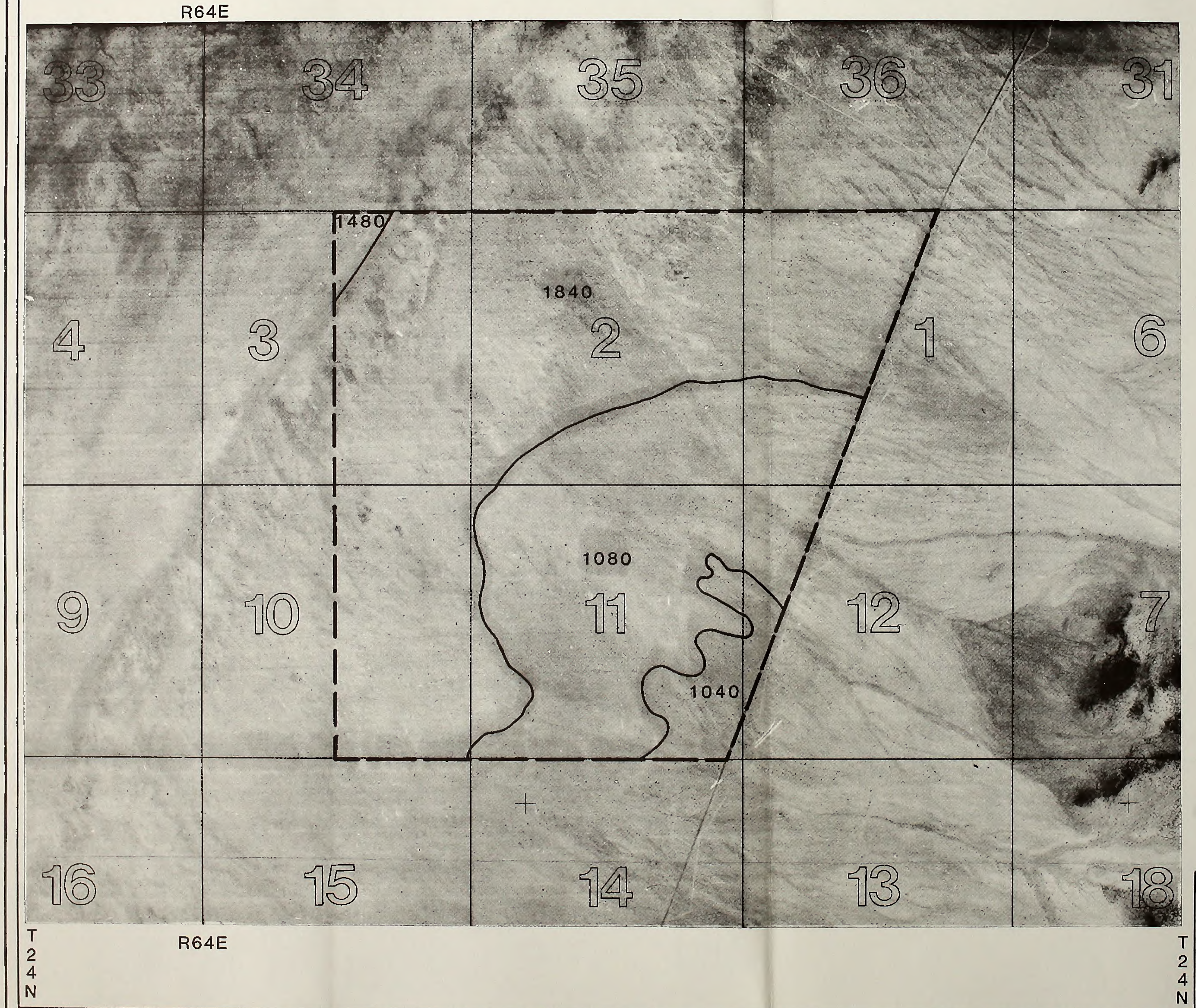


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

SOILS AND ECOLOGICAL SITES
BUTTE VALLEY SITE

FIGURE 3-14



LEGEND

MAPPING UNIT NUMBER	MAJOR SOIL SERIES	MAJOR ECOLOGICAL SITES[a]
1040	Sanpete	Loamy 8-10
1080	Dera	Loamy 5-8
1480	Duffer, Flooded	Saline Meadow 5-12 (20%)
1480	Equis	Saline Bottom 5-12 (30%)
1480	Boofus	Sodic Flat 5-12 (40%)
1840	Riepe	Sodic Terrace 6-8 (45%)
1840	Stimca	Sodic Terrace 8-10 (40%)

a Unless noted by (%), over 80% of the mapping unit is the listed ecological site. The percentages are the estimated occurrences of ecological sites and other lands within the mapping unit.

Source:

U.S. Soil Conservation Service

U.S. Bureau of Land Management

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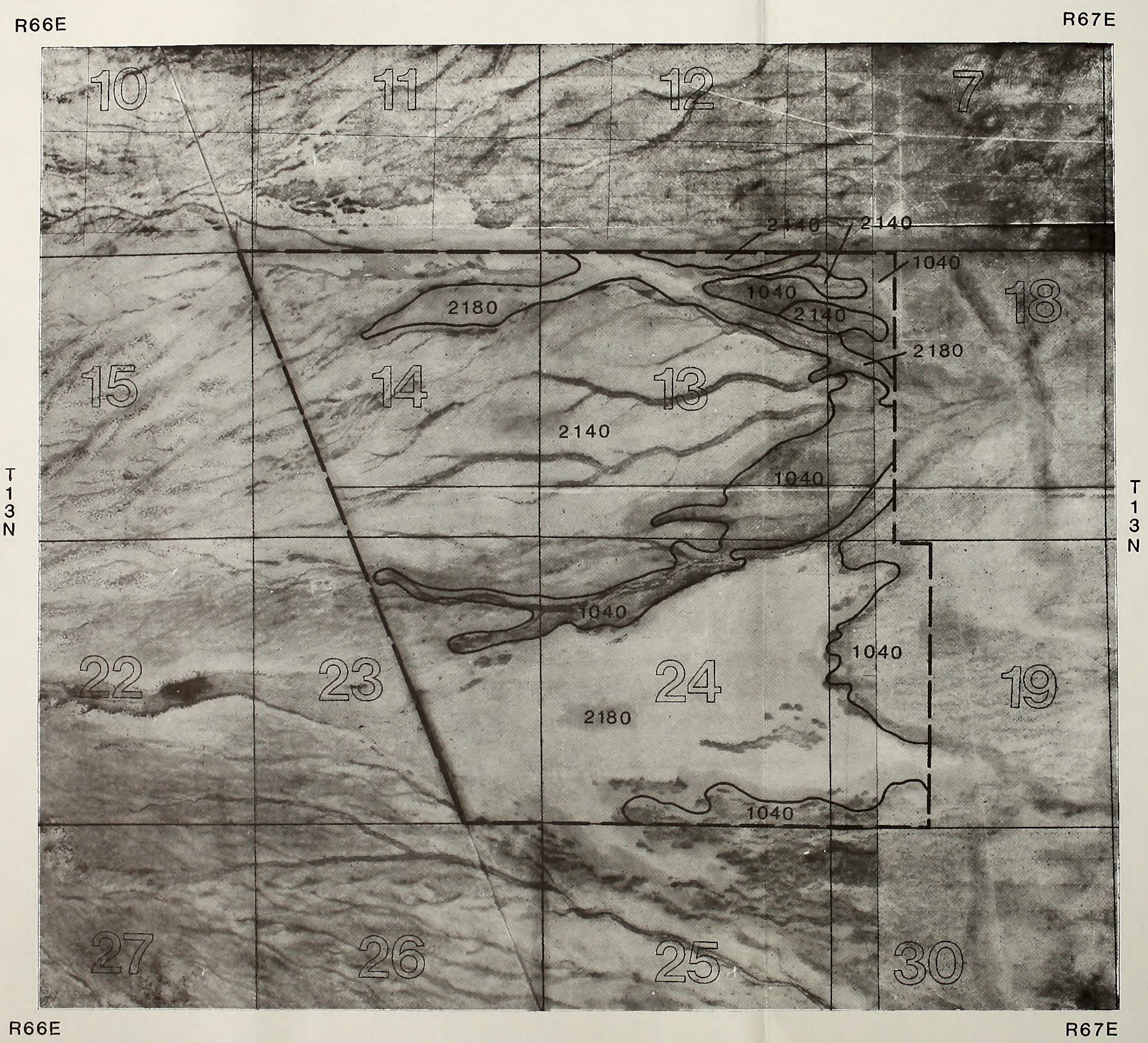
WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

SOILS AND ECOLOGICAL SITES
NORTH STEPTOE VALLEY SITE

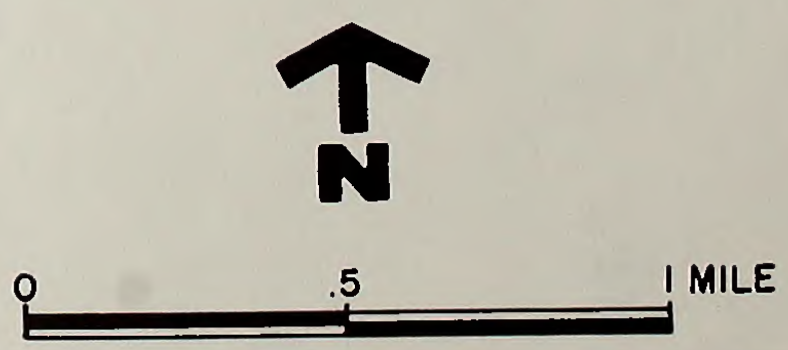
FIGURE 3-15



LEGEND

MAPPING UNIT NUMBER	MAJOR SOIL SERIES	MAJOR ECOLOGICAL SITES
1040	Sanpete	Loamy 8-10
2140	Ursine	Shallow Calcareous Loam 8-12
2180	Lusetti	Silty 8-10

Source:
U.S. Soil Conservation Service
U.S. Bureau of Land Management



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

SOILS AND ECOLOGICAL SITES
SPRING VALLEY SITE

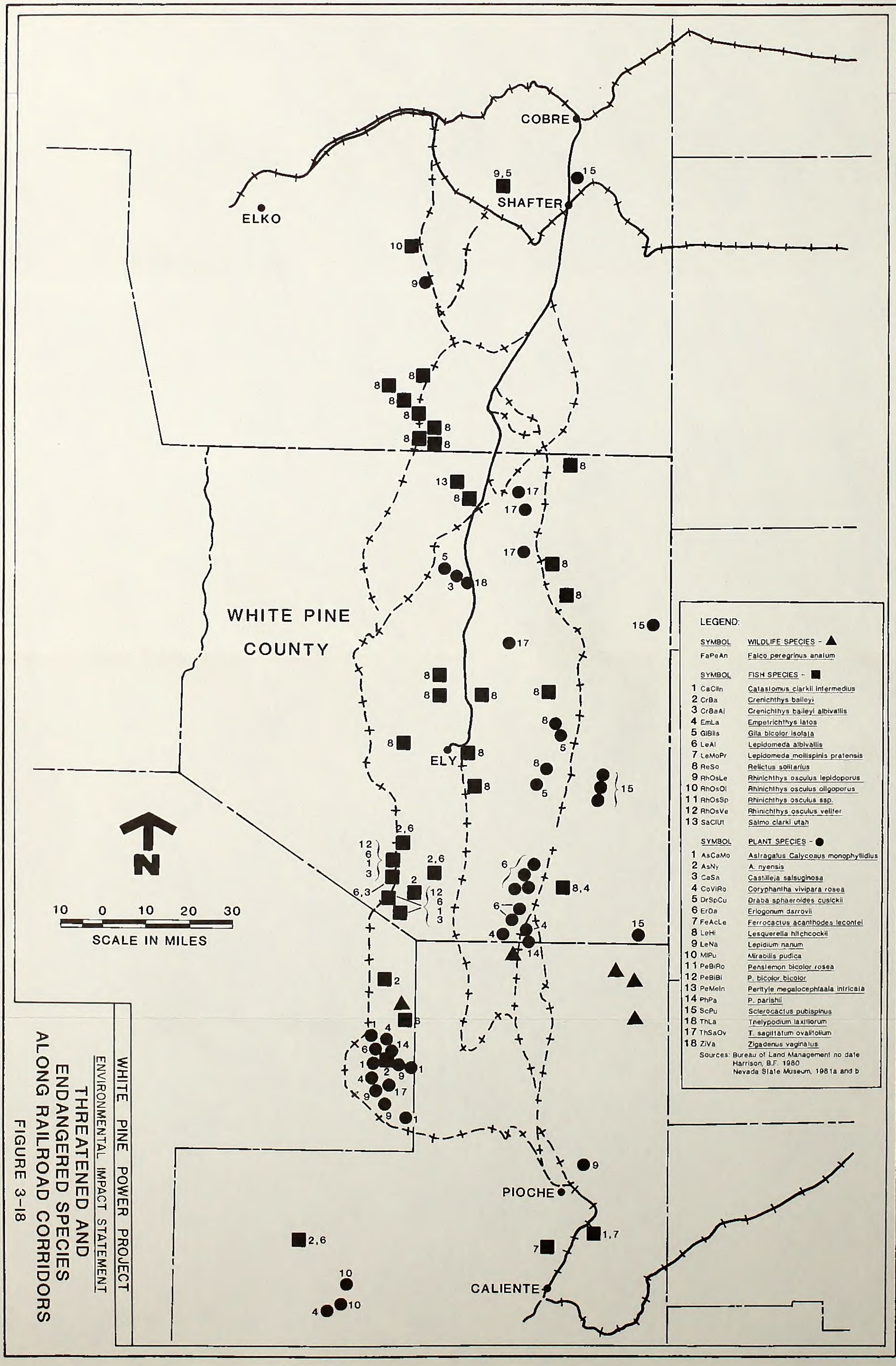
FIGURE 3-16

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

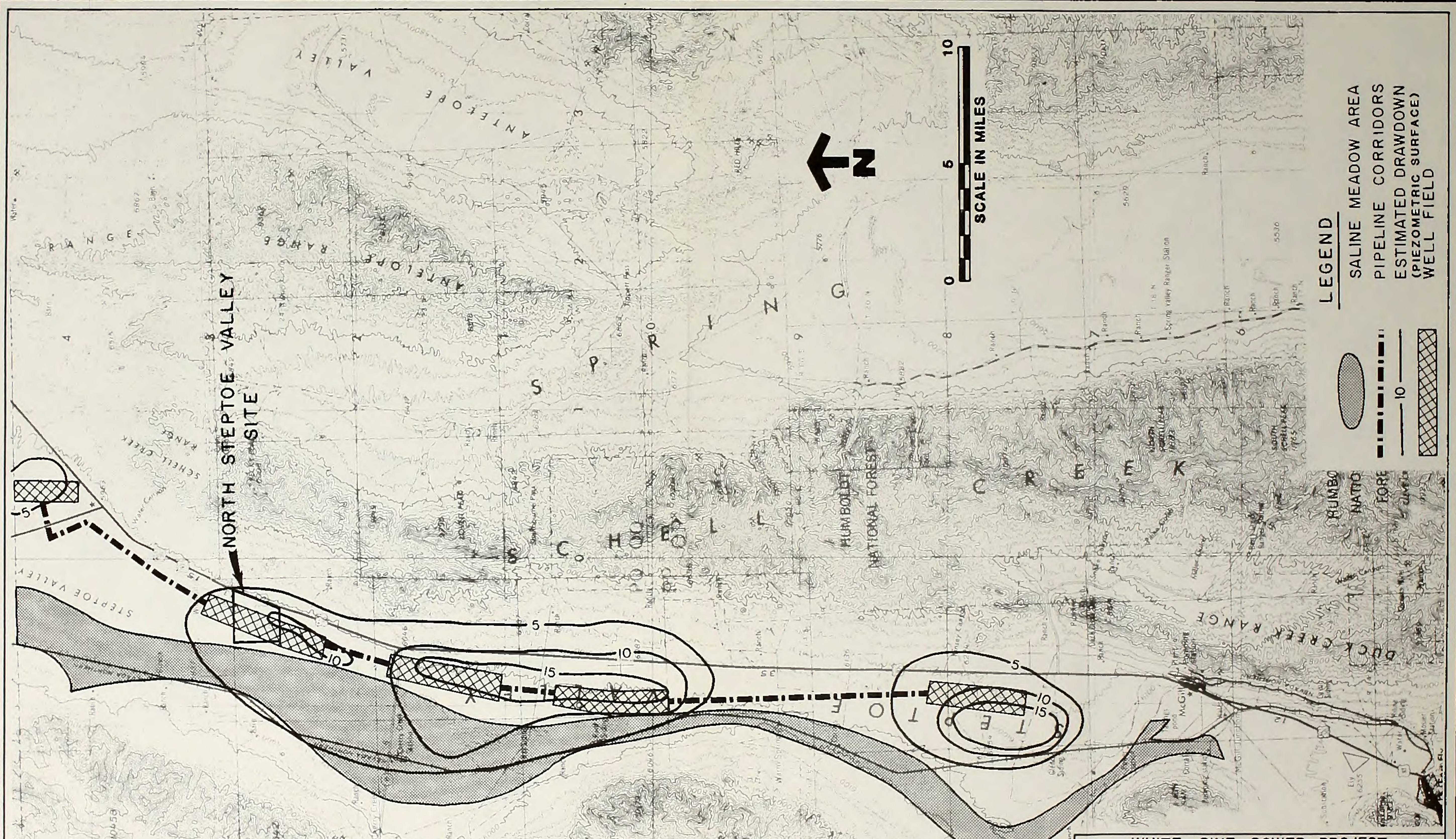
THREATENED AND ENDANGERED SPECIES ALONG TRANSMISSION LINE CORRIDORS

FIGURE 3-17



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

THREATENED AND
ENDANGERED SPECIES
ALONG RAILROAD CORRIDORS
FIGURE 3-18

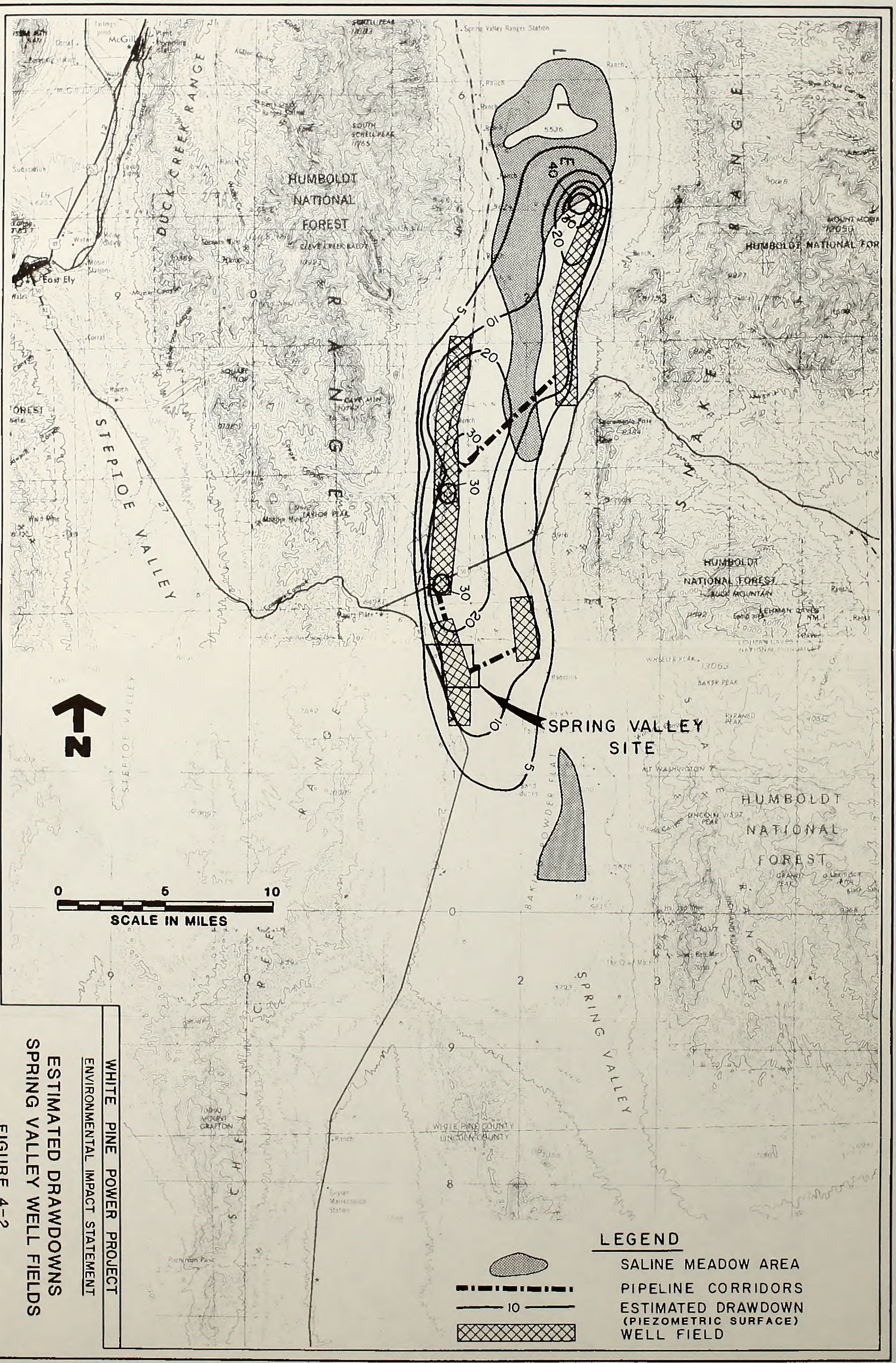


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

ESTIMATED DRAWDOWNS
STEPTOE VALLEY WELL FIELDS

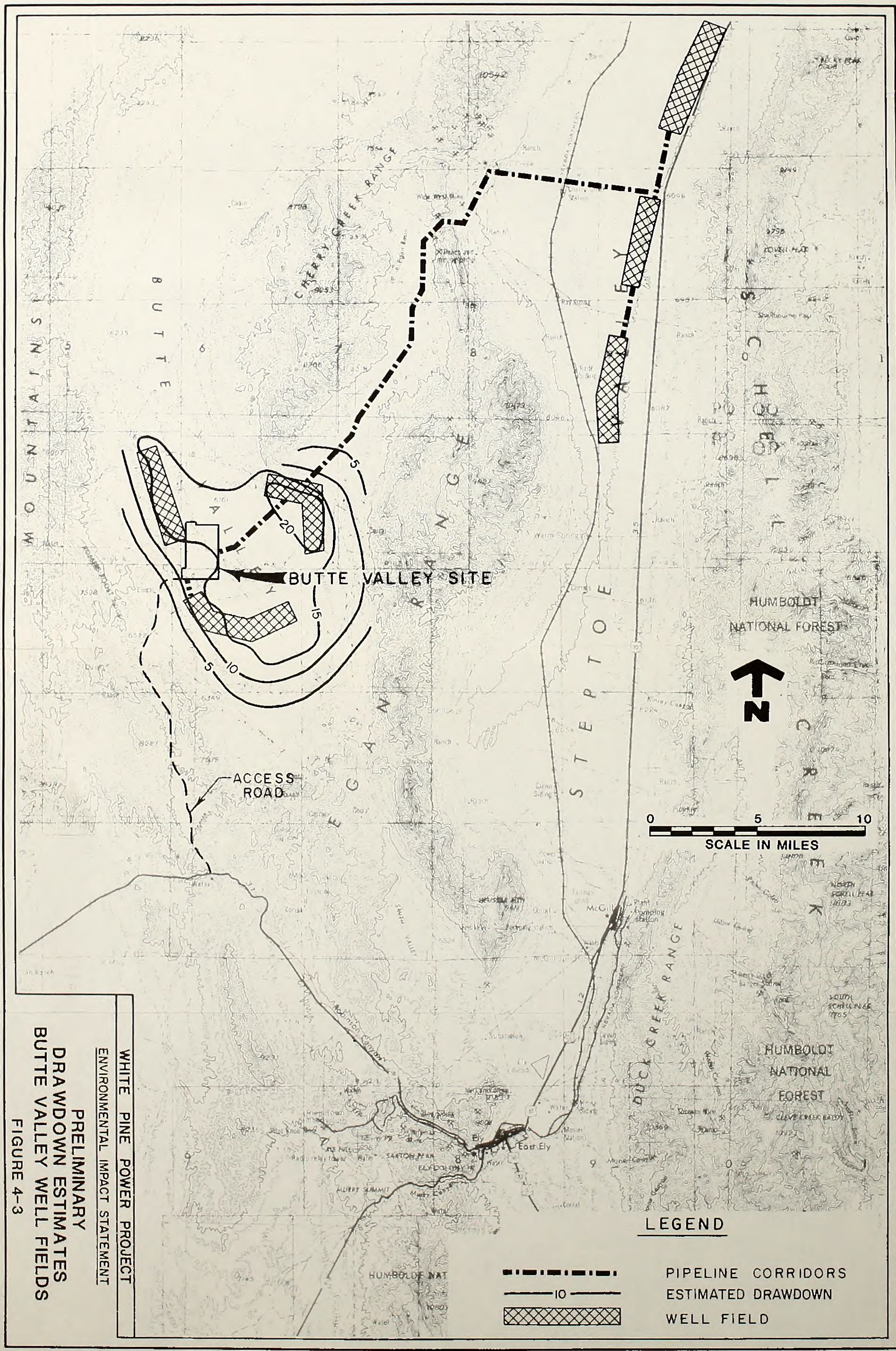
FIGURE 4-1



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

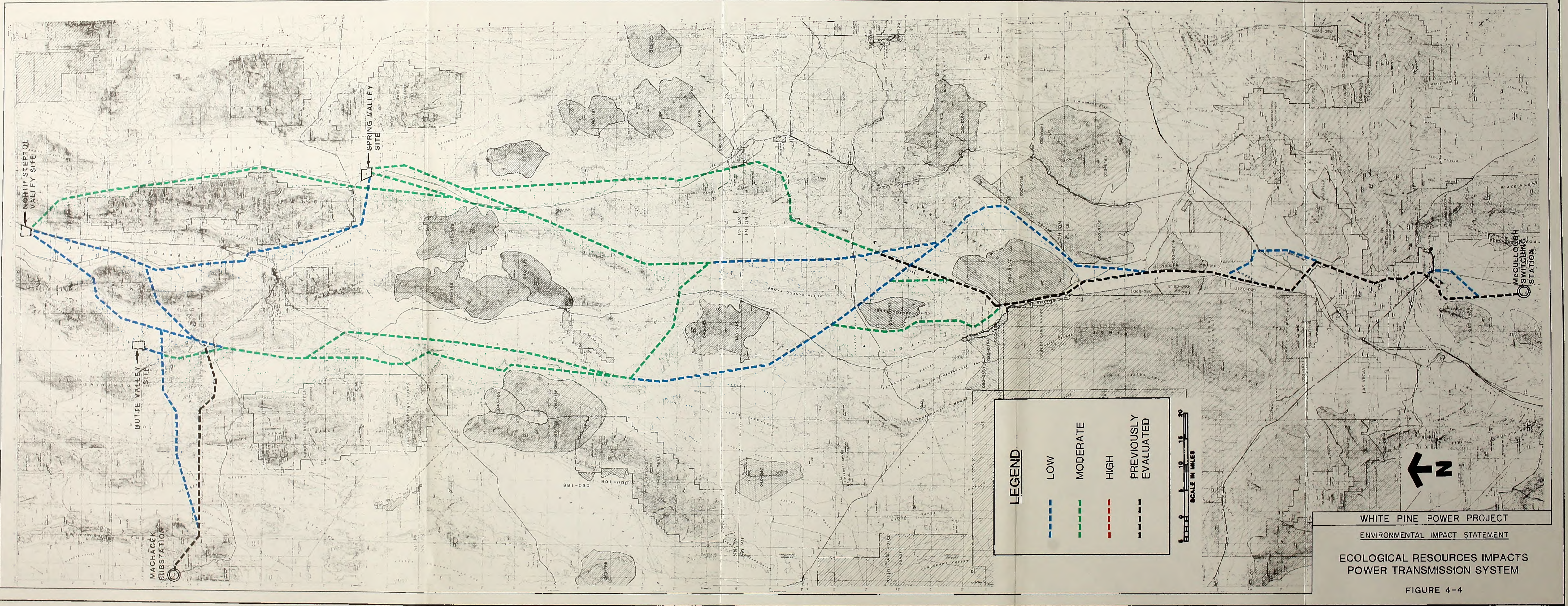
ESTIMATED DRAWDOWNS
SPRING VALLEY WELL FIELDS

FIGURE 4-2



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

PRELIMINARY
DRAWDOWN ESTIMATES
BUTTE VALLEY WELL FIELDS
FIGURE 4-3

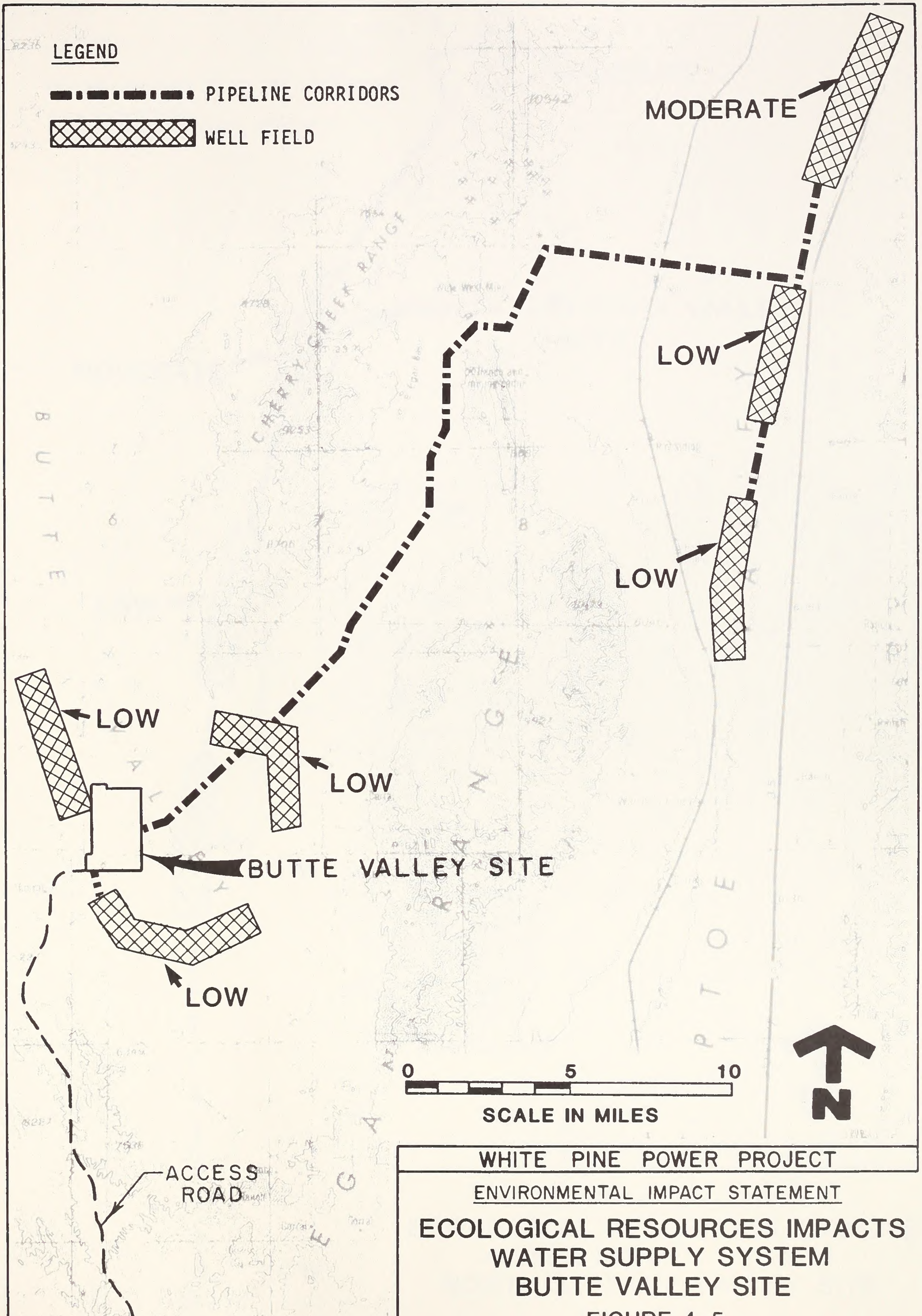


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

ECOLOGICAL RESOURCES IMPACTS
POWER TRANSMISSION SYSTEM

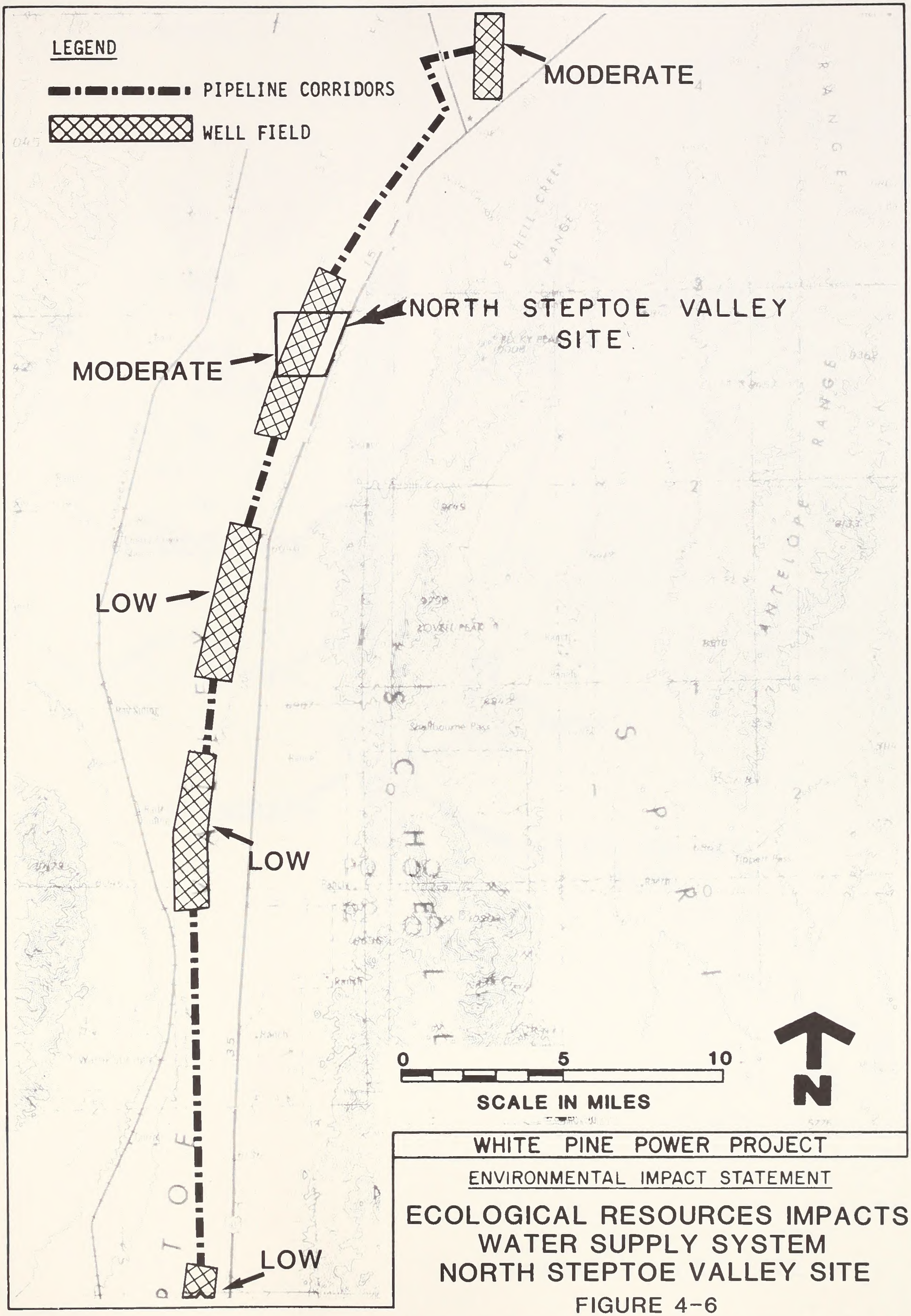
FIGURE 4-4



WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

ECOLOGICAL RESOURCES IMPACTS
WATER SUPPLY SYSTEM
BUTTE VALLEY SITE
FIGURE 4-5

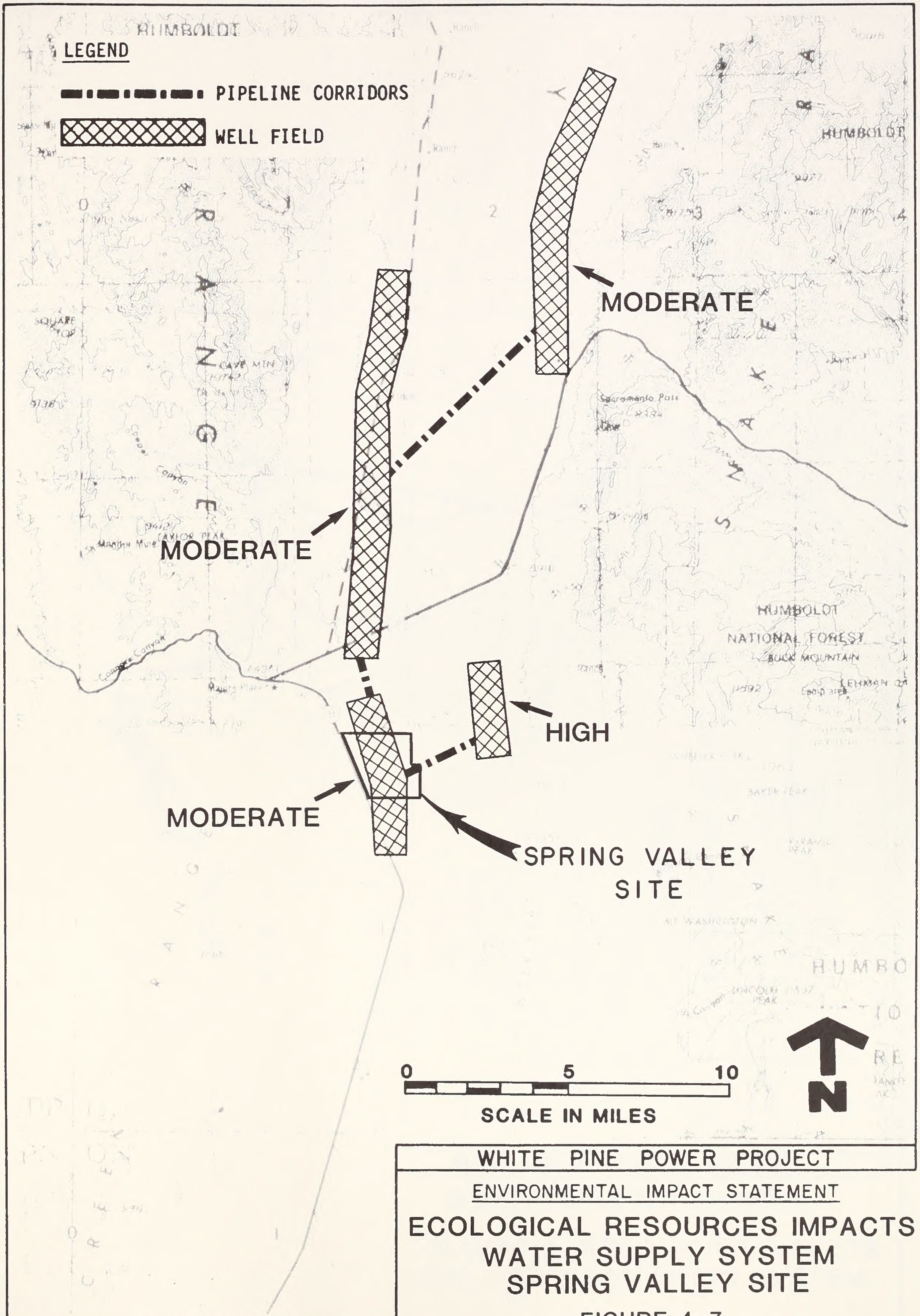


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

ECOLOGICAL RESOURCES IMPACTS
WATER SUPPLY SYSTEM
NORTH STEPTOE VALLEY SITE

FIGURE 4-6

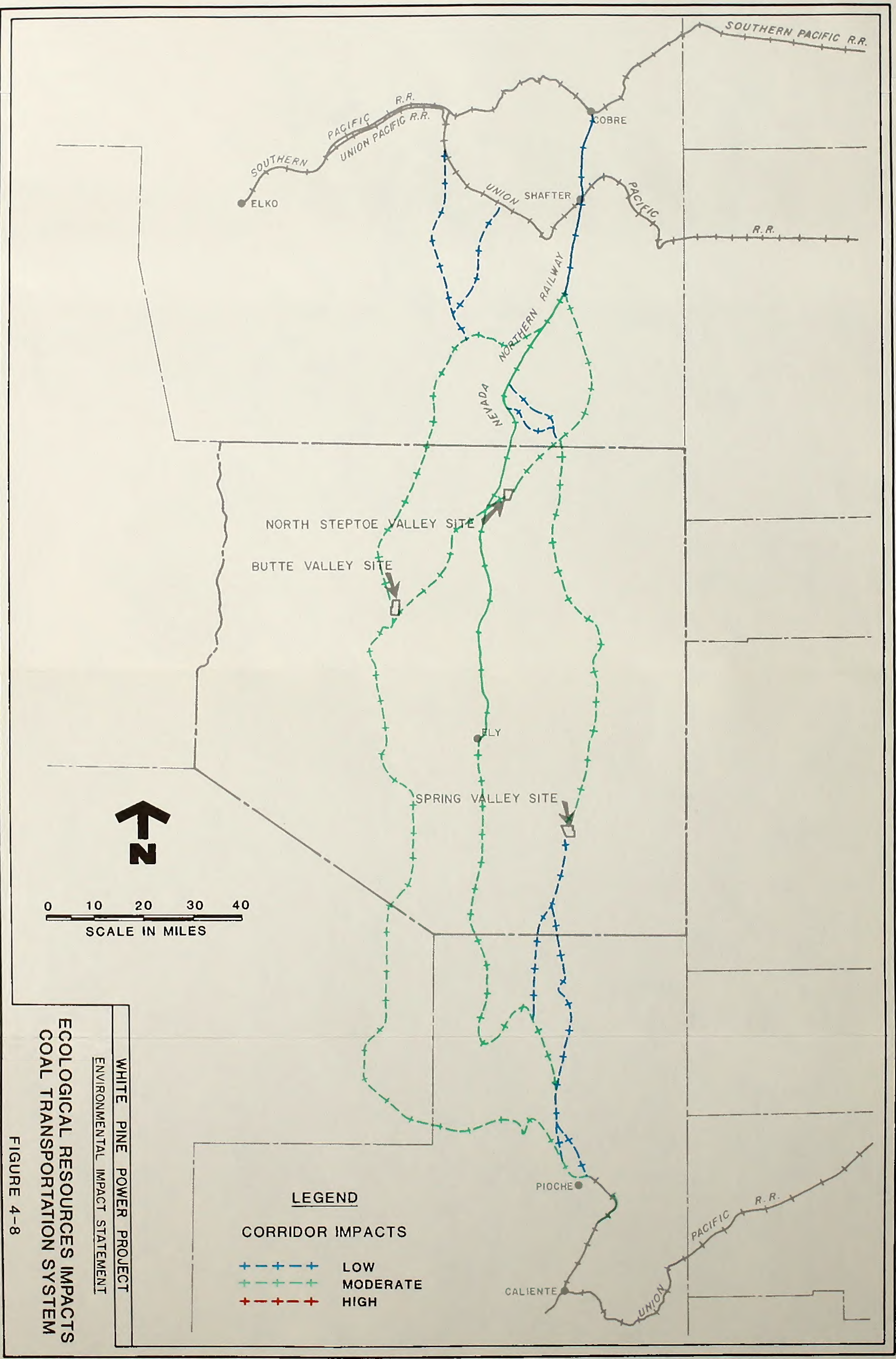


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

ECOLOGICAL RESOURCES IMPACTS
WATER SUPPLY SYSTEM
SPRING VALLEY SITE

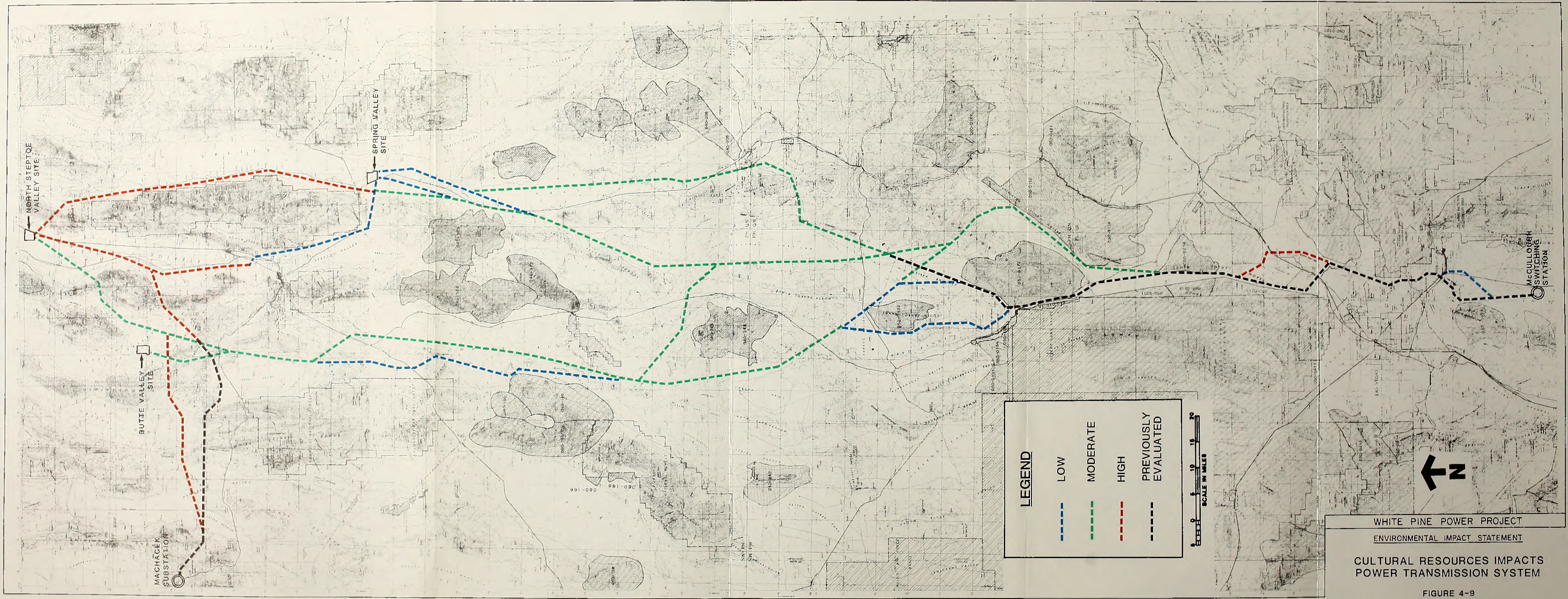
FIGURE 4-7



WHITE PINE POWER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

ECOLOGICAL RESOURCES IMPACTS
COAL TRANSPORTATION SYSTEM

FIGURE 4-8

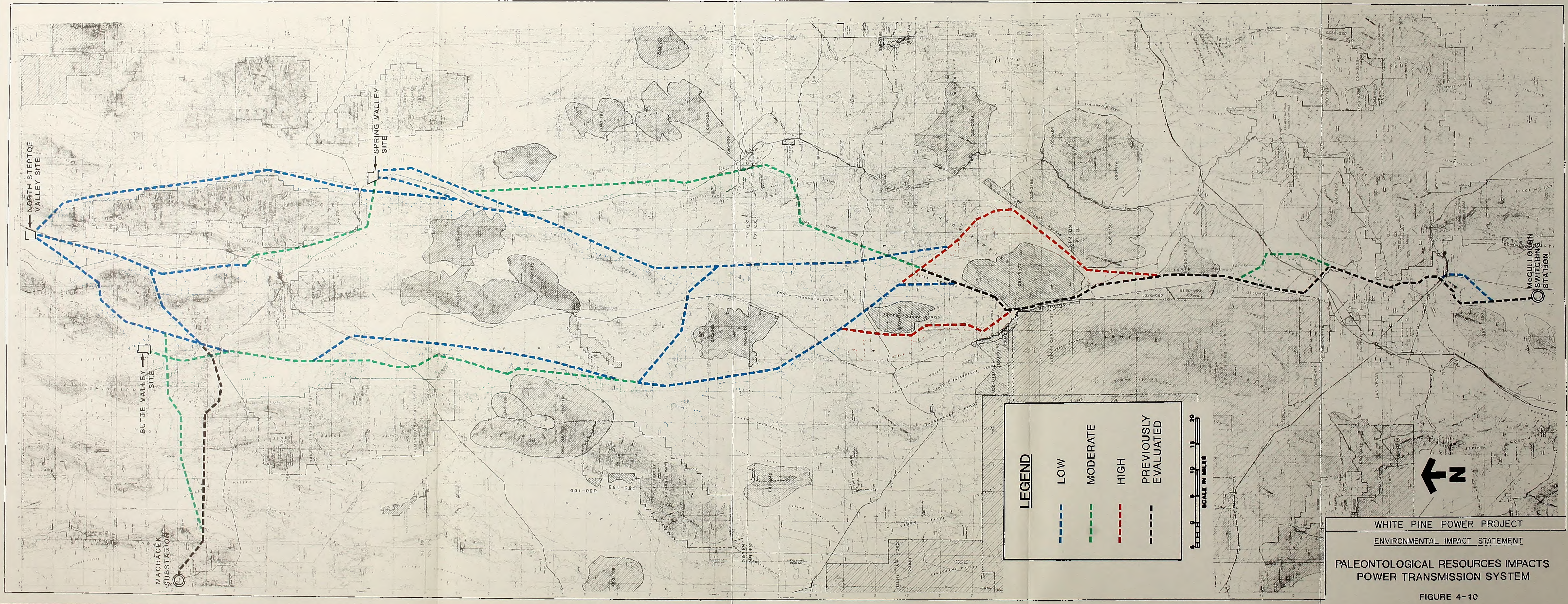


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

CULTURAL RESOURCES IMPACTS
POWER TRANSMISSION SYSTEM

FIGURE 4-9

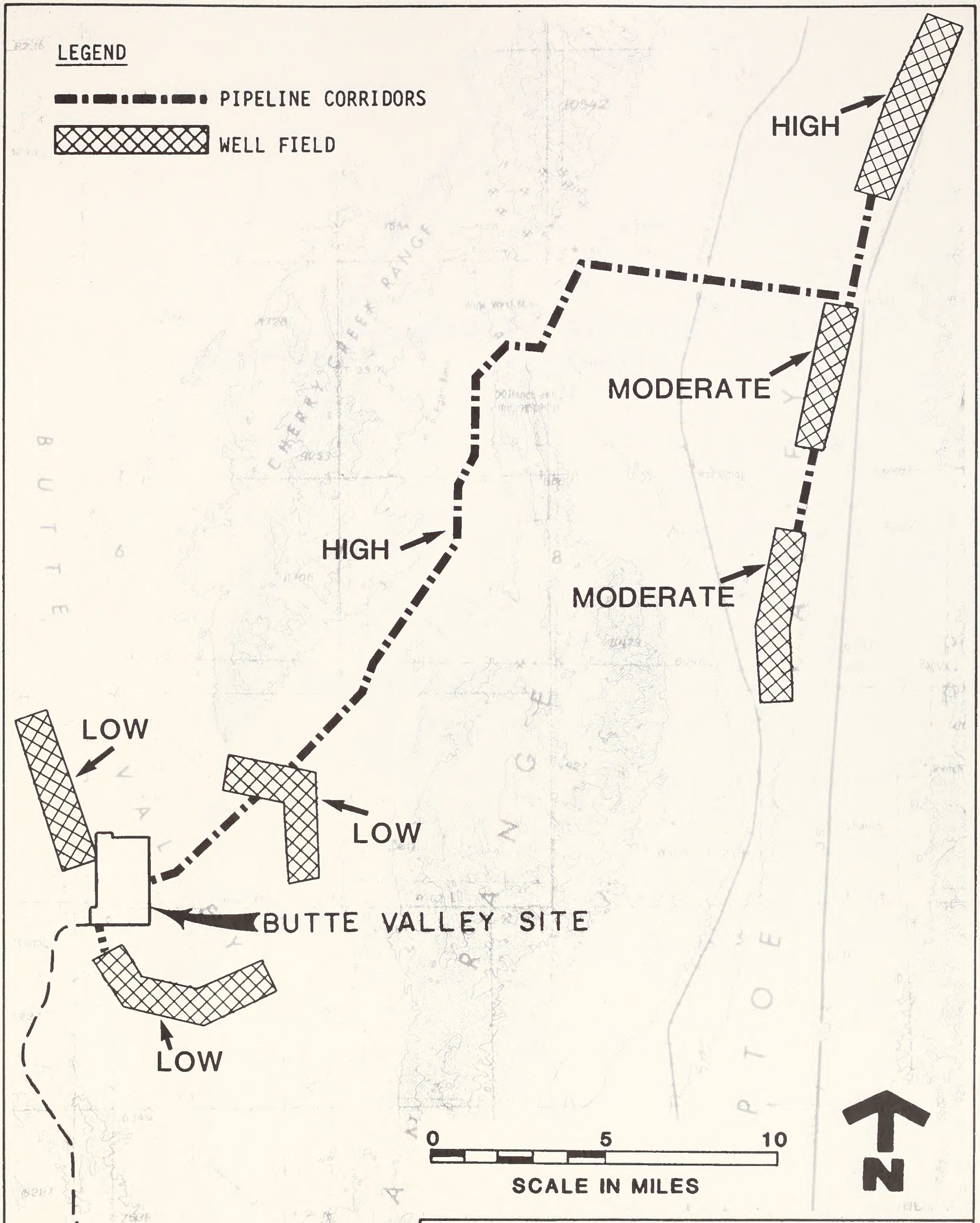


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

PALEONTOLOGICAL RESOURCES IMPACTS
POWER TRANSMISSION SYSTEM

FIGURE 4-10

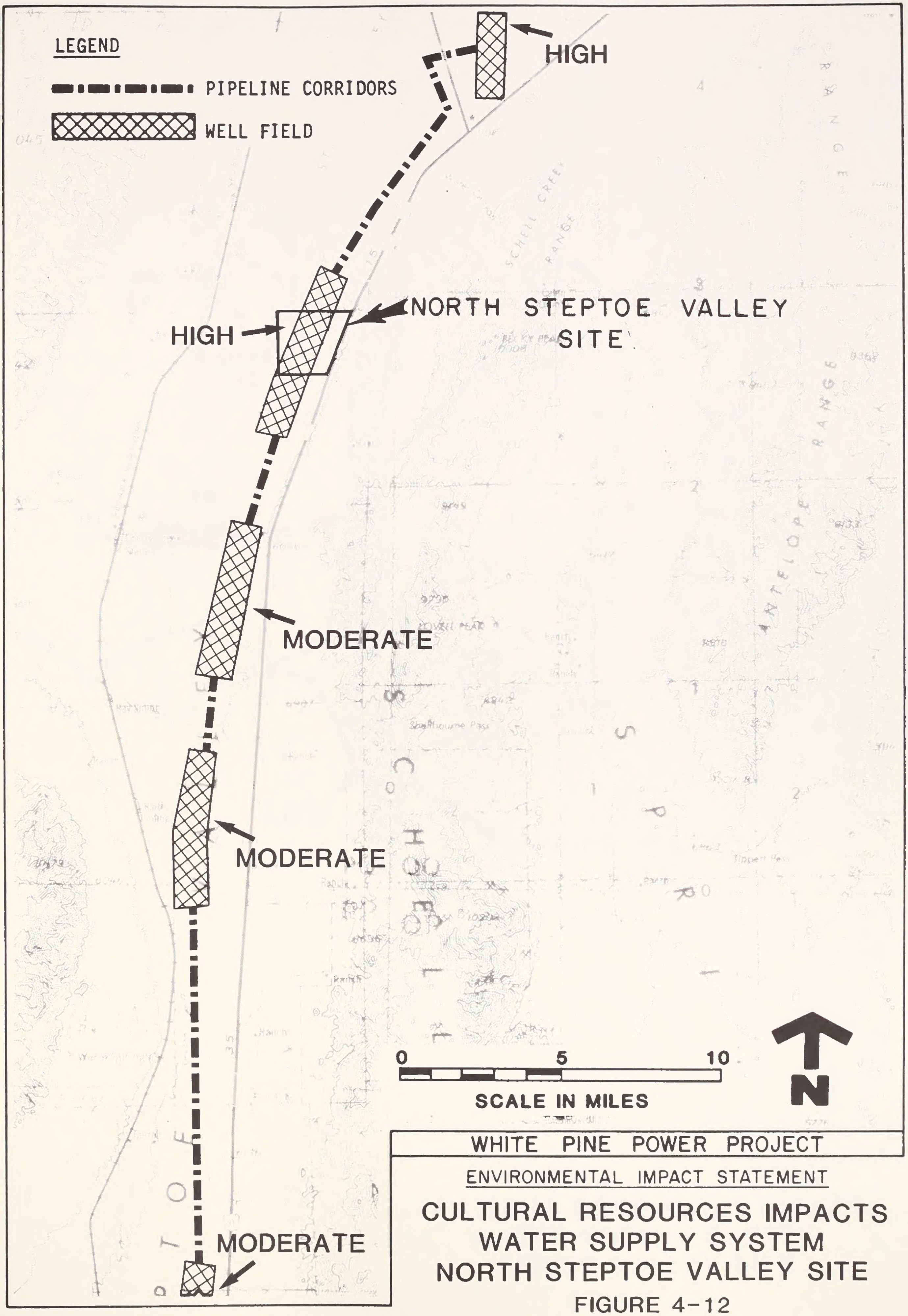


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

CULTURAL RESOURCES IMPACTS
WATER SUPPLY SYSTEM
BUTTE VALLEY SITE

FIGURE 4-11

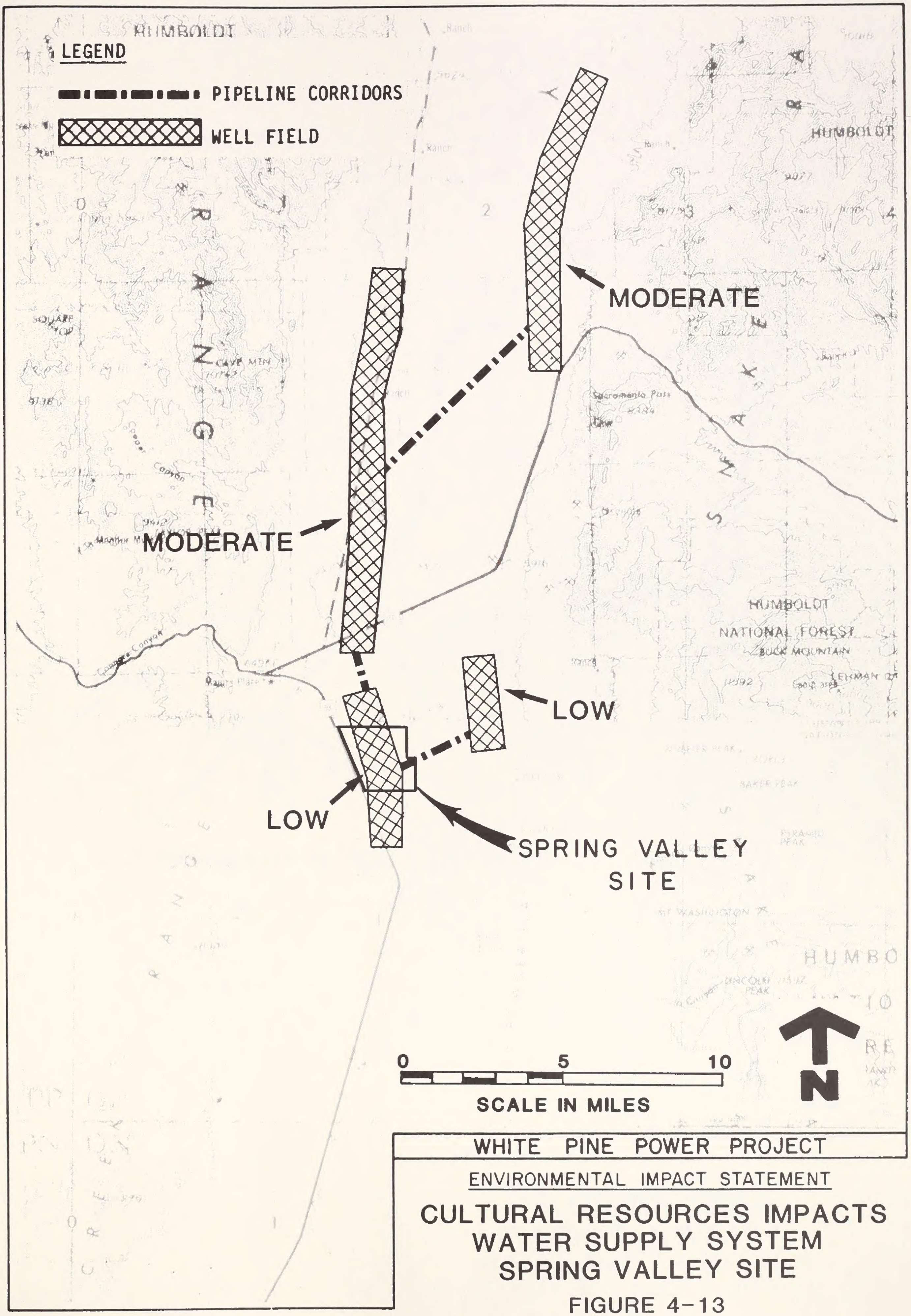


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

CULTURAL RESOURCES IMPACTS
WATER SUPPLY SYSTEM
NORTH STEPTOE VALLEY SITE

FIGURE 4-12

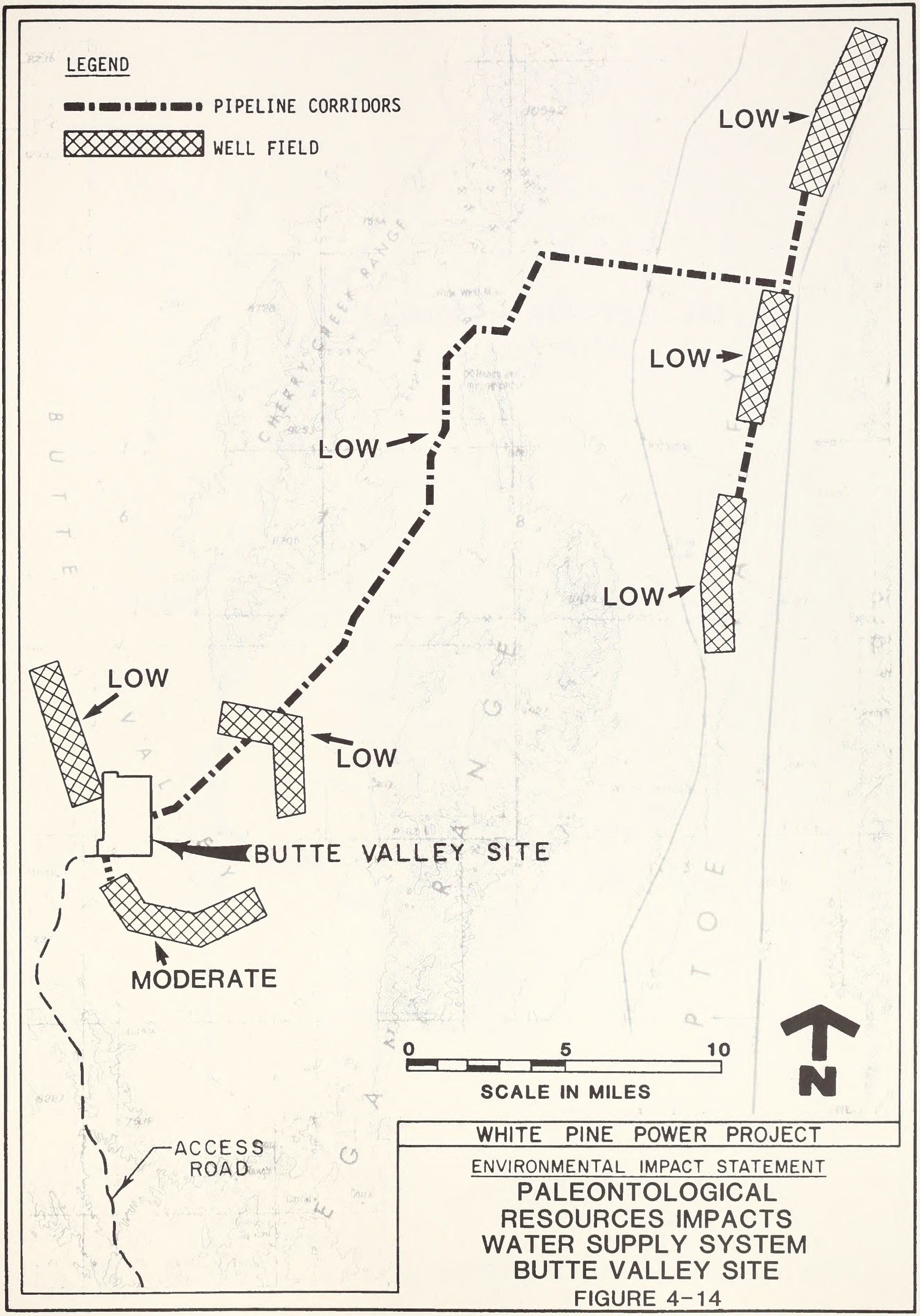


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

CULTURAL RESOURCES IMPACTS
WATER SUPPLY SYSTEM
SPRING VALLEY SITE

FIGURE 4-13

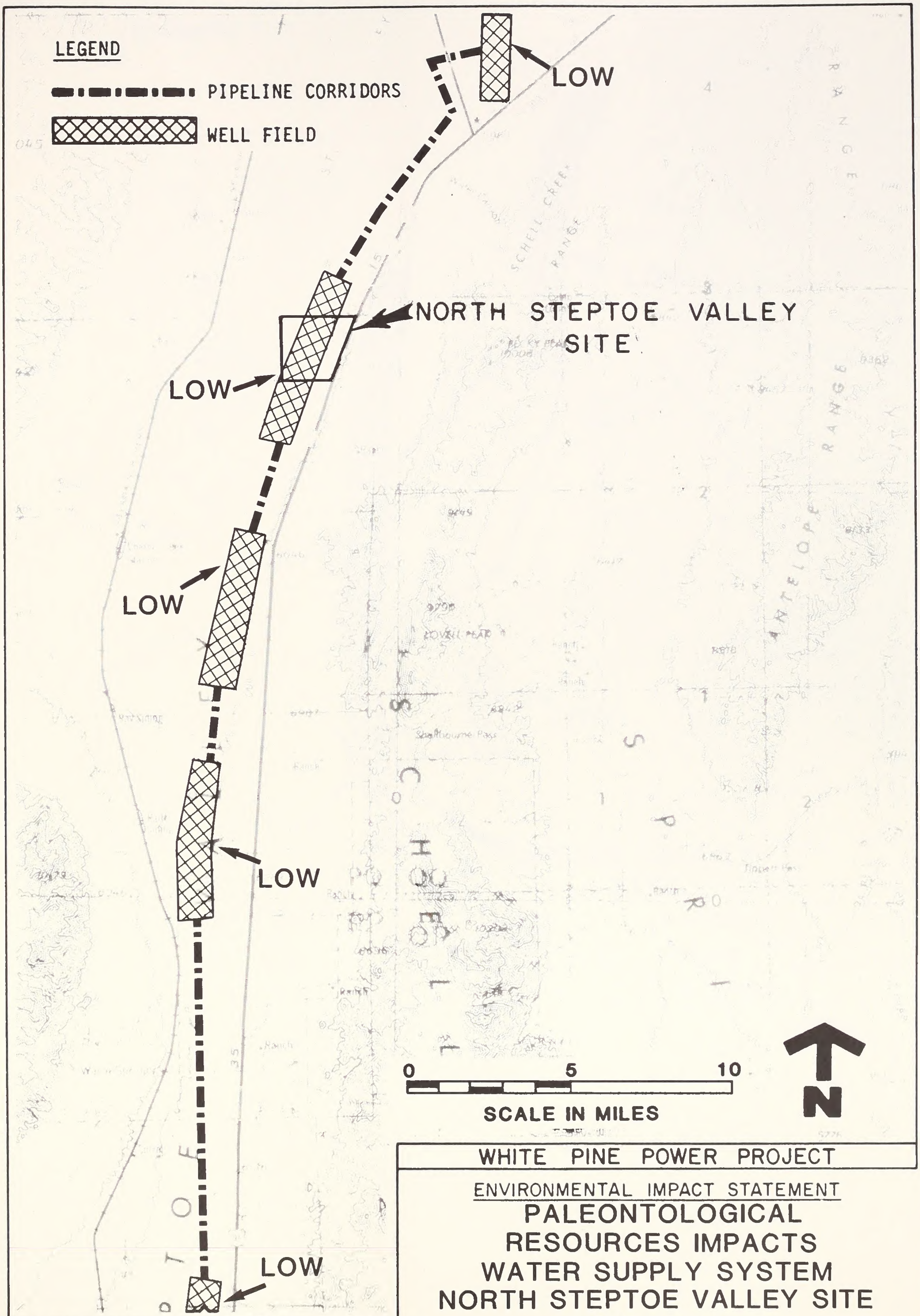


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

PALEONTOLOGICAL RESOURCES IMPACTS WATER SUPPLY SYSTEM BUTTE VALLEY SITE

FIGURE 4-14

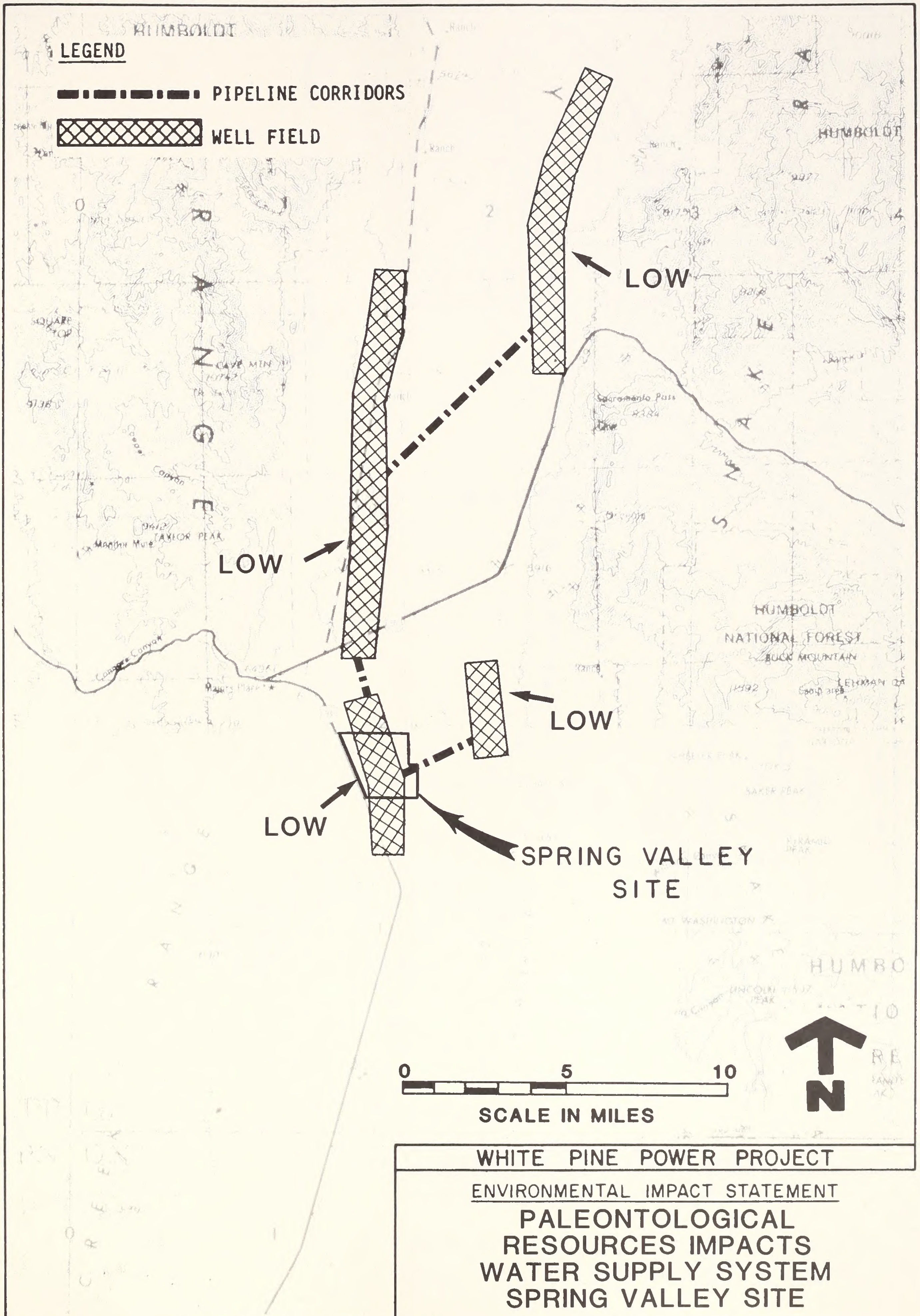


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

PALEONTOLOGICAL RESOURCES IMPACTS WATER SUPPLY SYSTEM NORTH STEPTOE VALLEY SITE

FIGURE 4-15

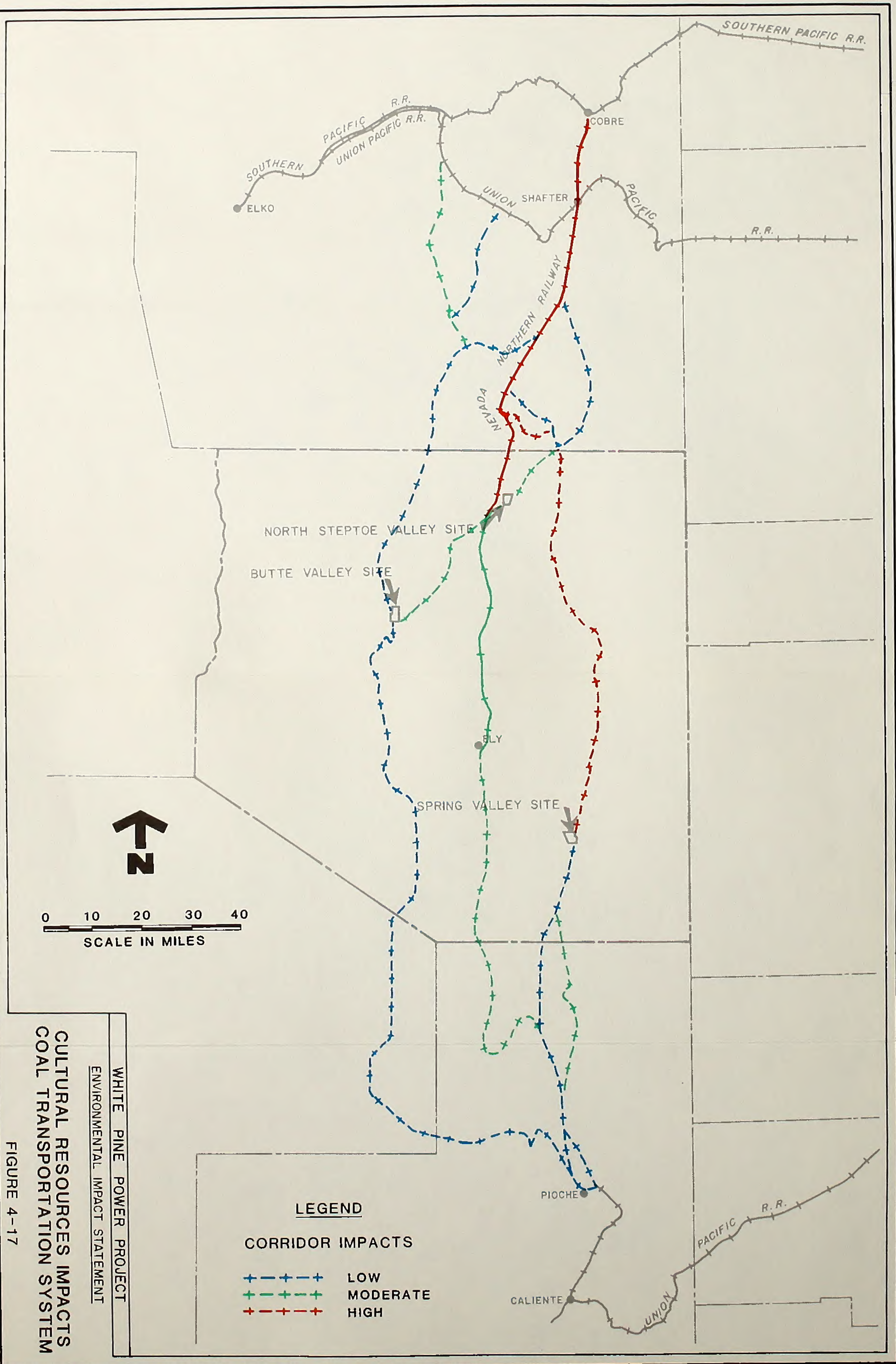


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

PALEONTOLOGICAL RESOURCES IMPACTS WATER SUPPLY SYSTEM SPRING VALLEY SITE

FIGURE 4-16

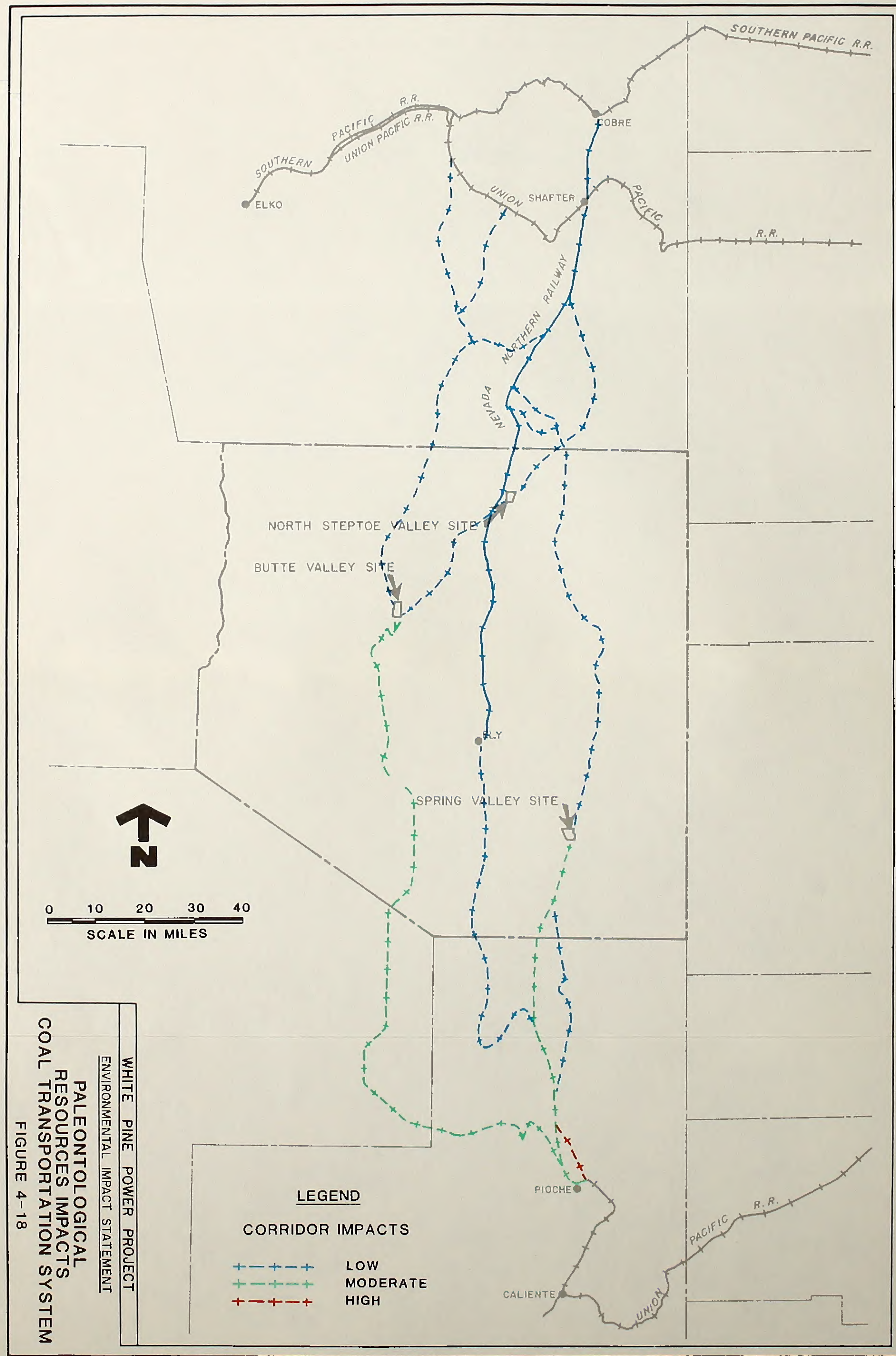


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

CULTURAL RESOURCES IMPACTS
COAL TRANSPORTATION SYSTEM

FIGURE 4-17

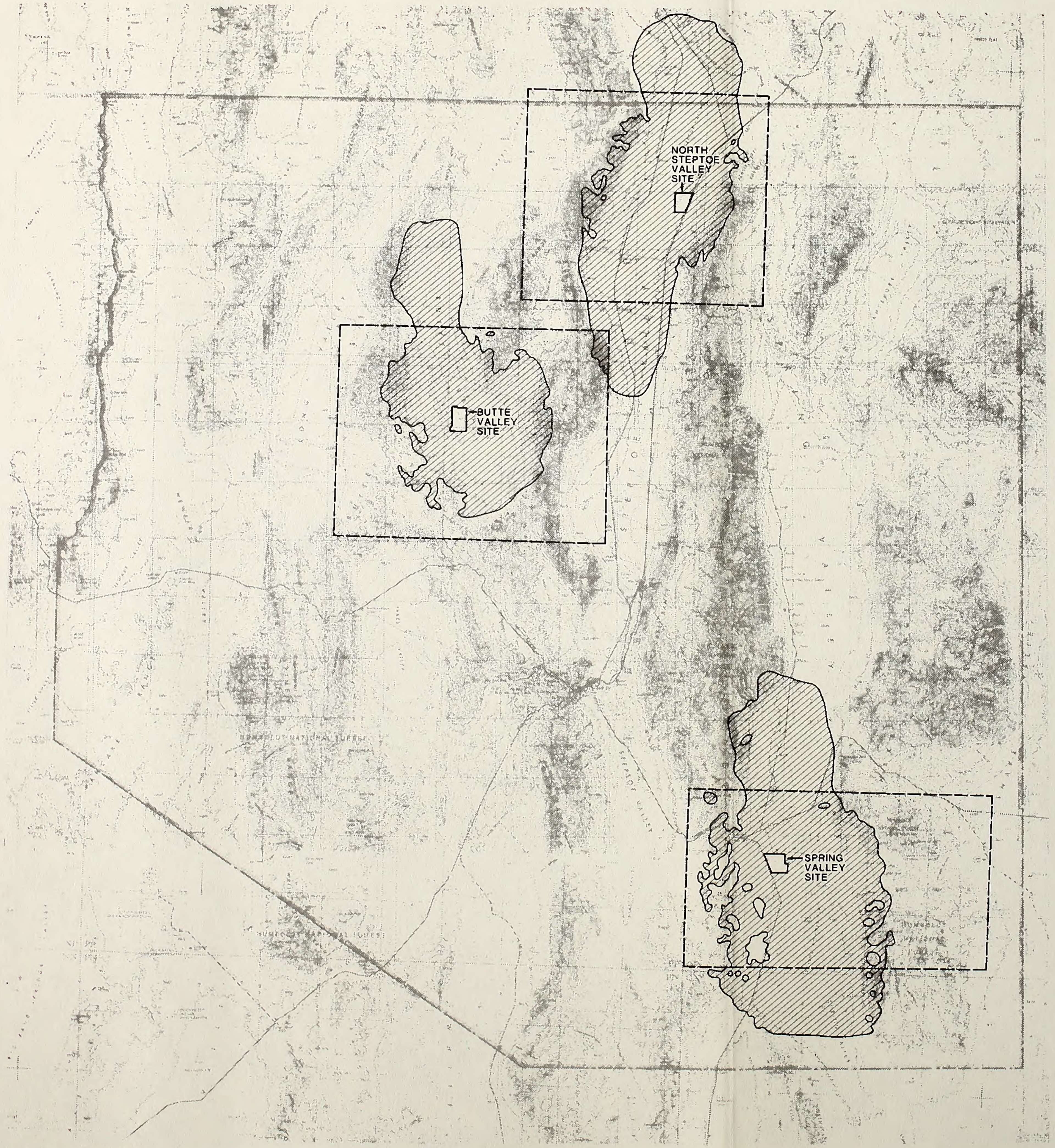


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

PALEONTOLOGICAL RESOURCES IMPACTS COAL TRANSPORTATION SYSTEM

FIGURE 4-18



LEGEND:

WPPP SITE

VIEWSHED (AREA FROM WHICH STACK WOULD BE SEEN)

LIMITS OF AREA SHOWN ON PERSPECTIVE VIEWS

NOTE: VIEWSHEDS WERE COMPUTED BY DAMES & MOORE'S GEOGRAPHIC INFORMATION MANAGEMENT SYSTEM (GIMS™) BASED ON DIGITAL TERRAIN DATA OBTAINED FROM THE USGS NATIONAL CARTOGRAPHIC INFORMATION CENTER.

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

VIEWSHED FOR WPPP GENERATING STATION

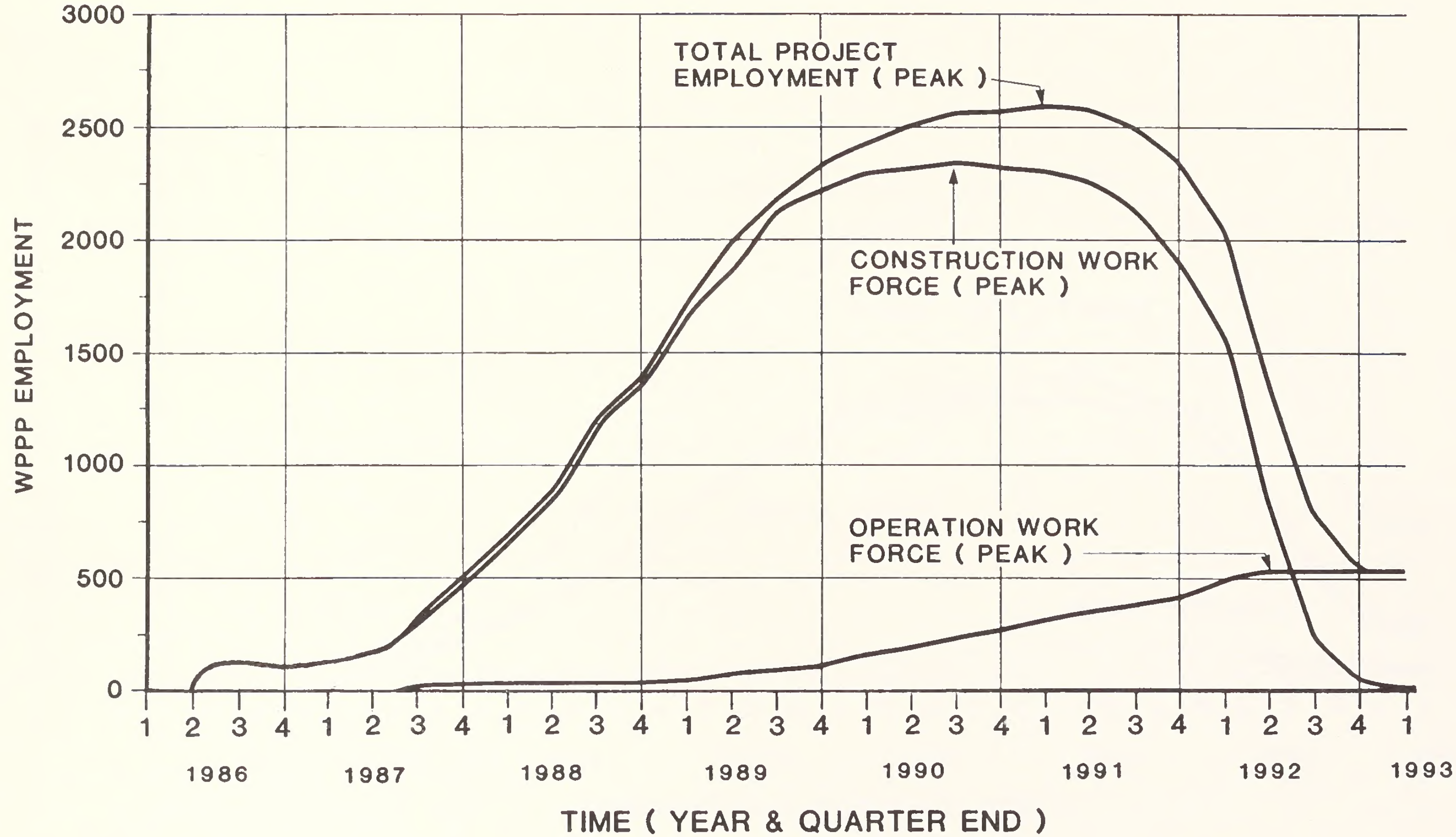
FIGURE 4-19

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

VISUAL SENSITIVITY RATINGS
POWER TRANSMISSION SYSTEM

FIGURE 4-20

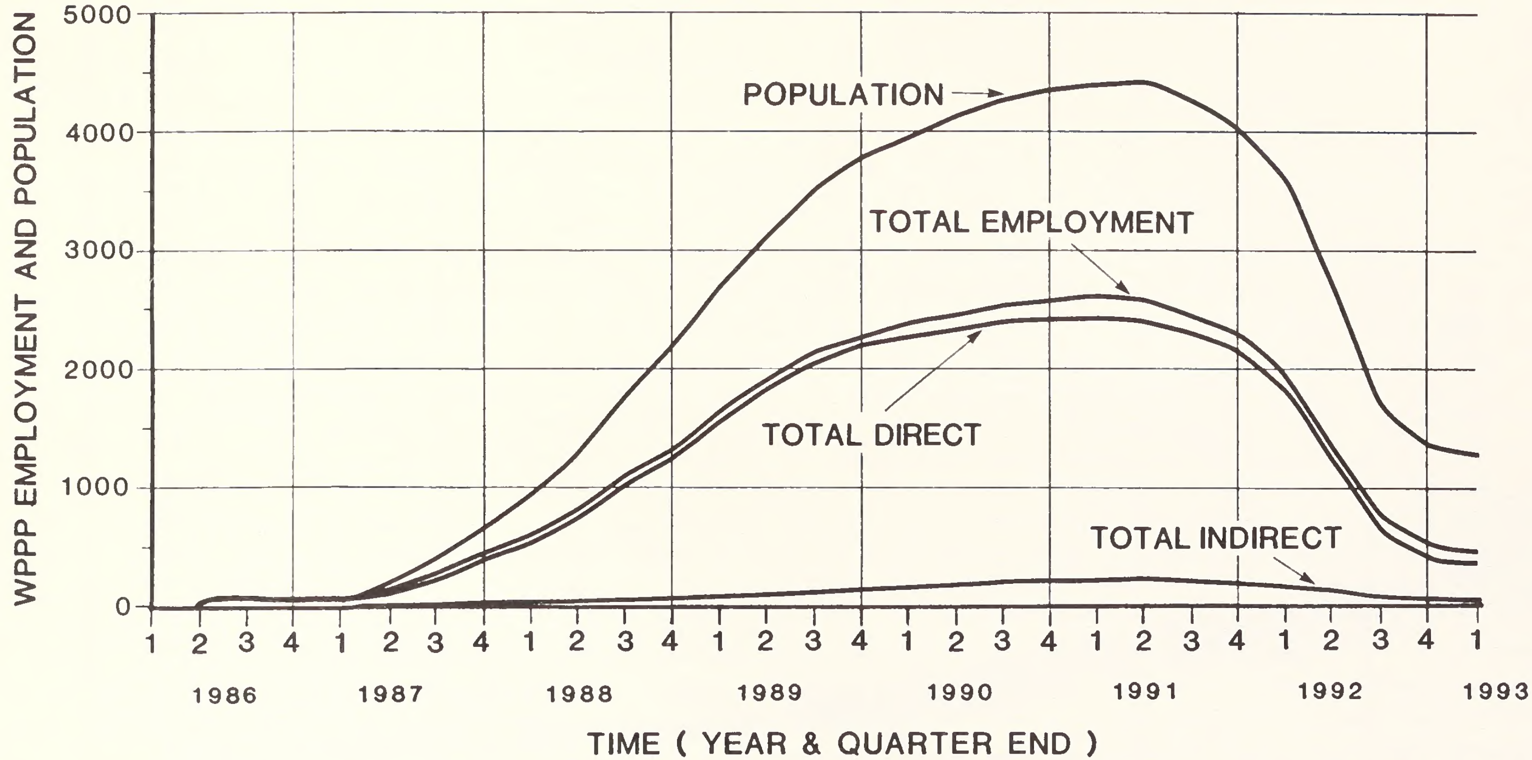


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

DIRECT WORK FORCE REQUIREMENTS

FIGURE 4-21

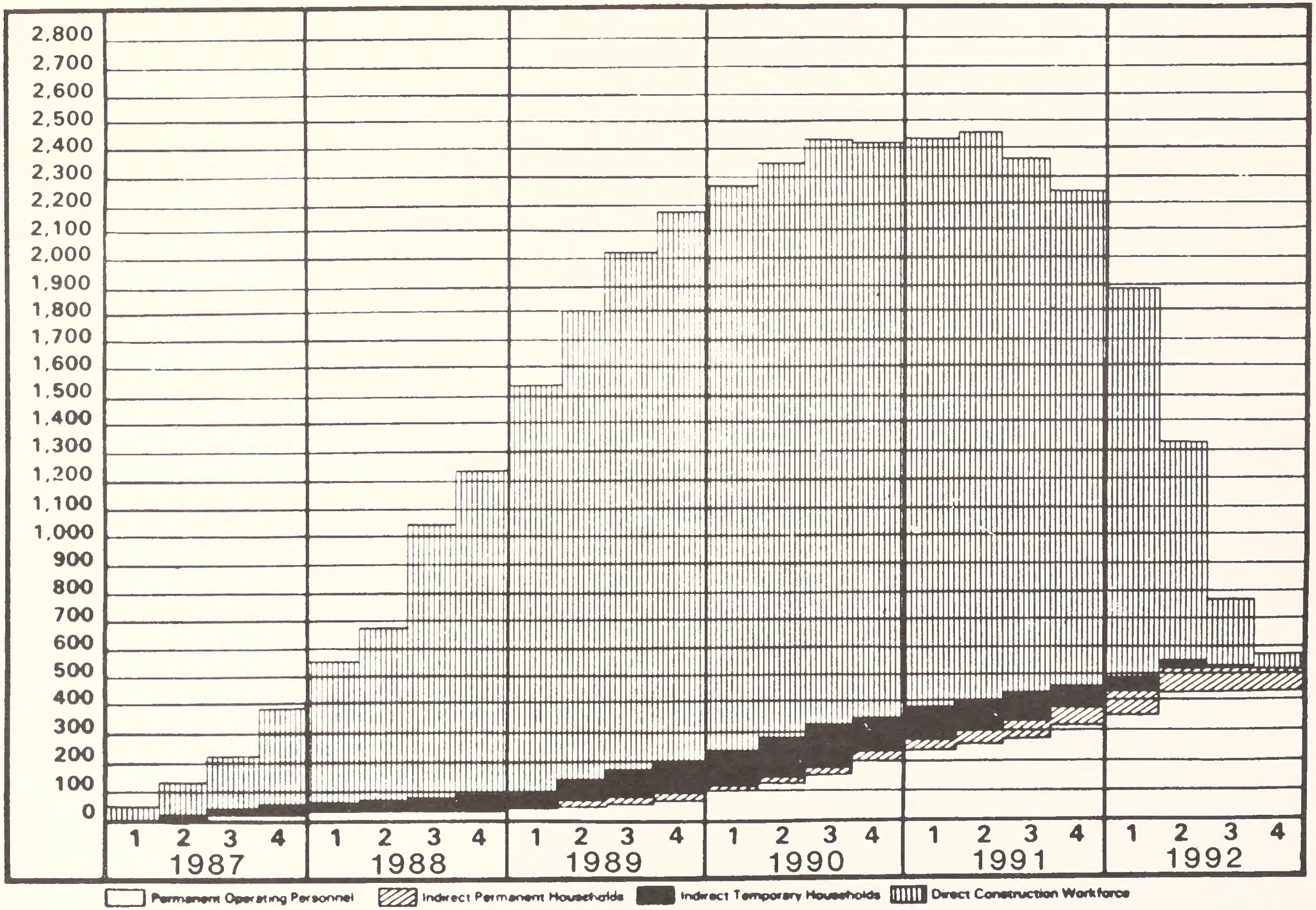


WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

DIRECT AND INDIRECT EMPLOYMENT AND POPULATION

FIGURE 4-22



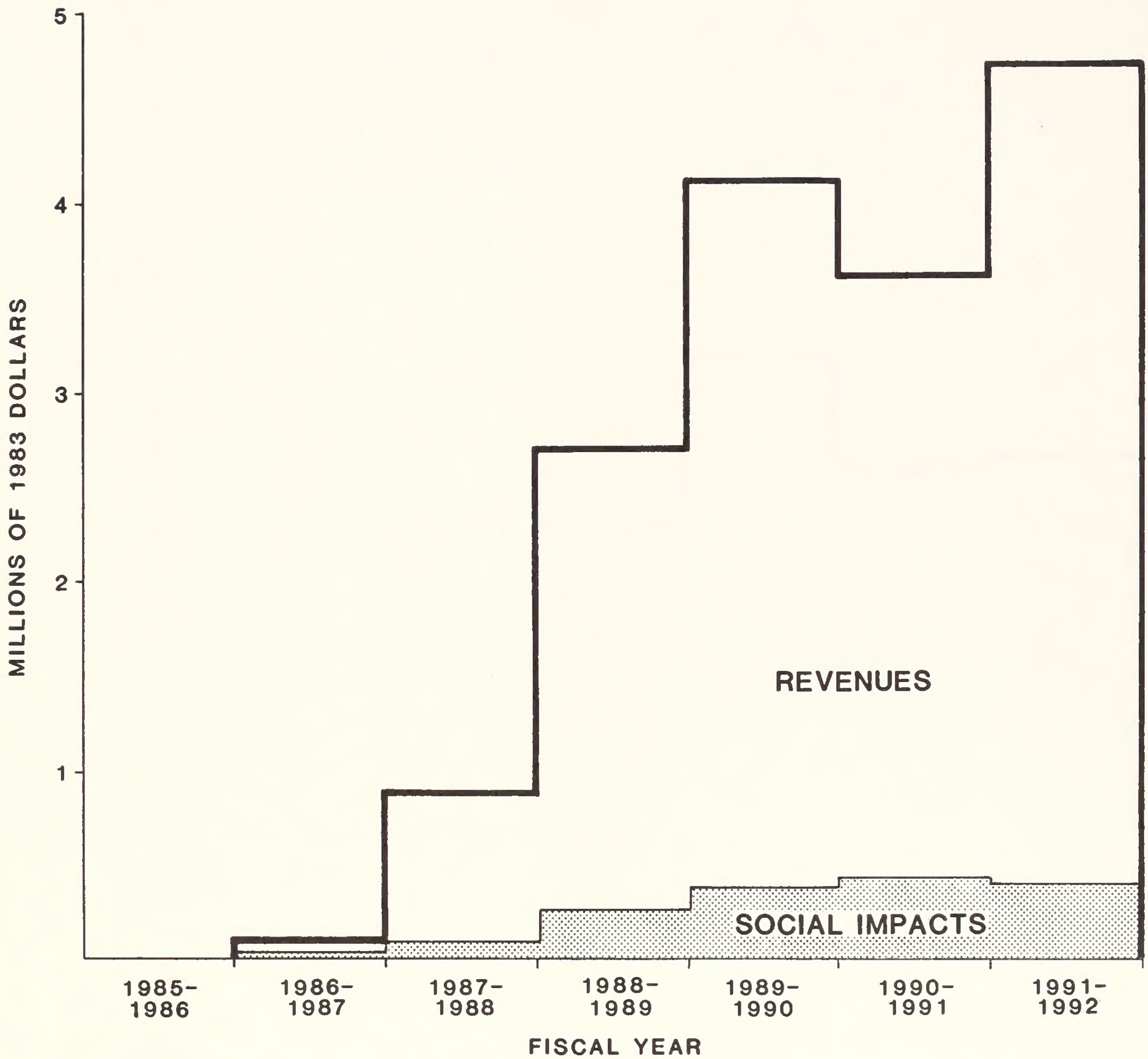
NOTE: A LIMITED AMOUNT OF HOUSING MAY BE NECESSARY FOR SOME DIRECT CONSTRUCTION WORKERS IN 1986

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

HOUSING DEMAND

FIGURE 4-23



REVENUES INCLUDE ALL TAX REVENUES AND IN LIEU OF AD VALOREM TAX REVENUES ATTRIBUTABLE TO WPPP PLUS SPECIAL CITY/COUNTY RELIEF TAX REVENUE RESULTING FROM WPPP ASSESSED VALUE ON CITY TAX ROLL.

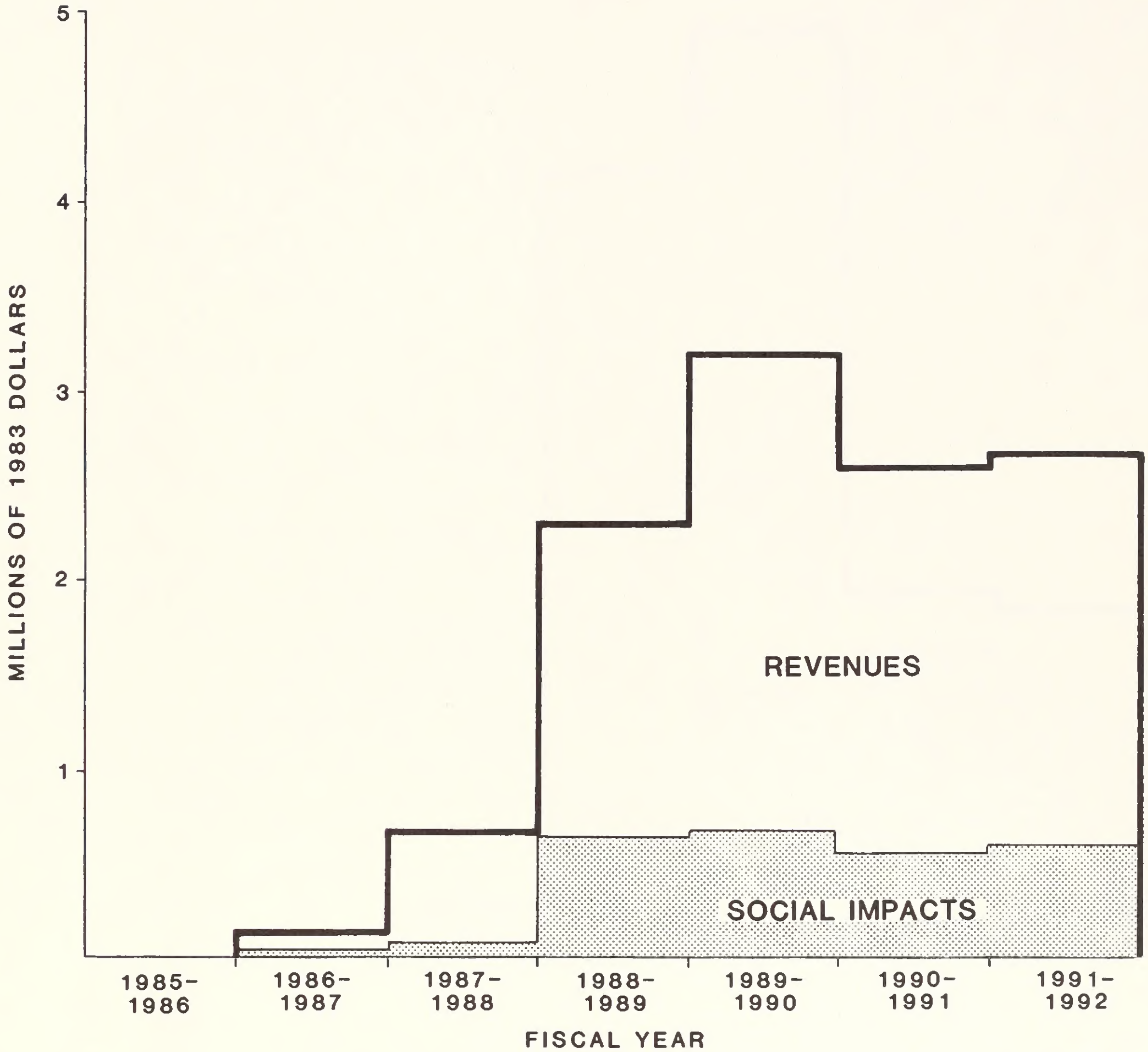
SOCIAL IMPACTS INCLUDE ALL COSTS NECESSARY TO ALLEVIATE FINANCIAL DEMANDS PLACED ON CITY SERVICES DUE TO WPPP.

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

REVENUES AND IMPACTS
WHITE PINE COUNTY

FIGURE 4-24



REVENUES INCLUDE ALL TAX REVENUES AND IN LIEU OF AD VALOREM TAX REVENUES ATTRIBUTABLE TO WPPP PLUS SPECIAL CITY/COUNTY RELIEF TAX REVENUE RESULTING FROM WPPP ASSESSED VALUE ON COUNTY TAX ROLL.

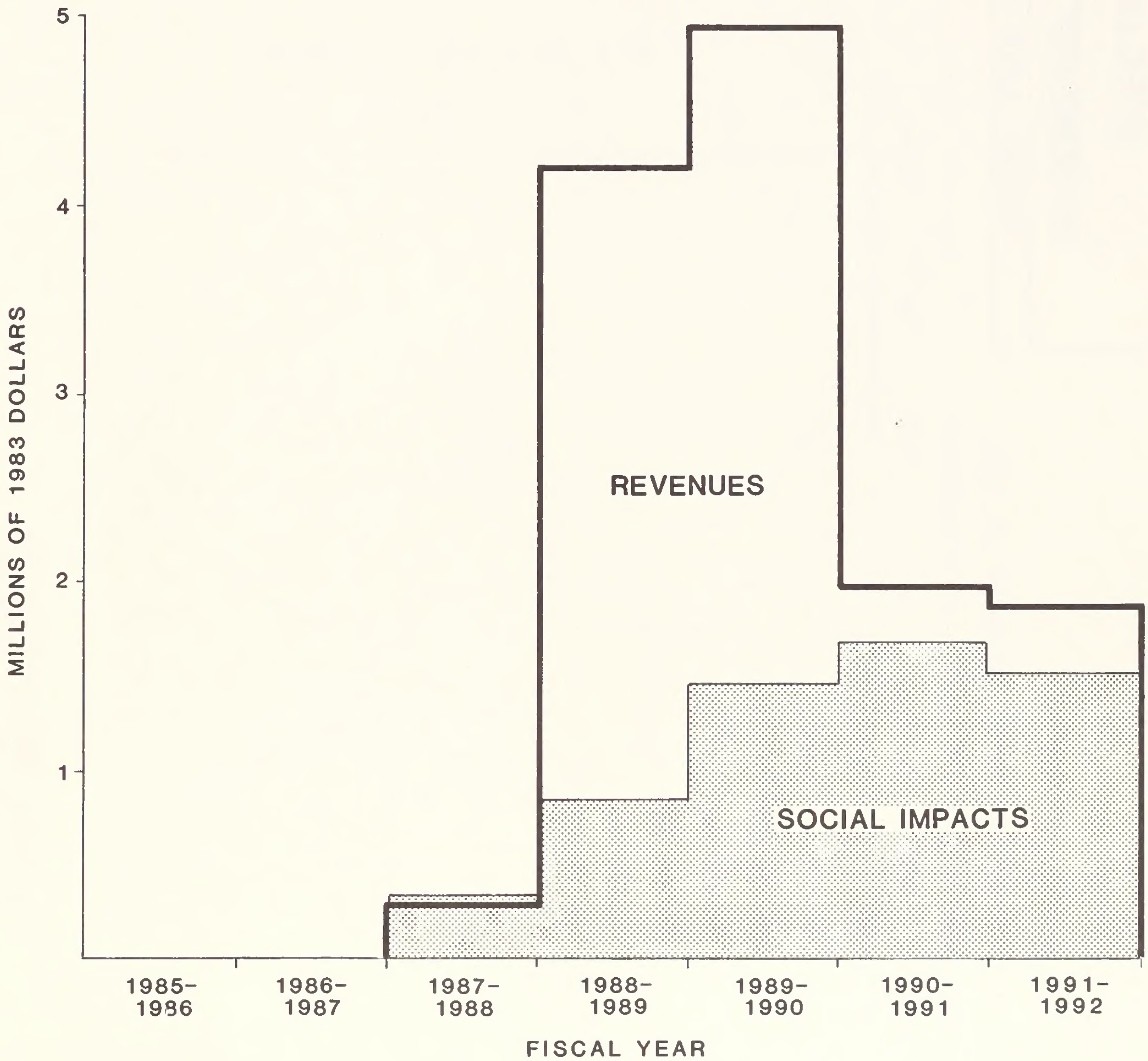
SOCIAL IMPACTS INCLUDE ALL COSTS NECESSARY TO ALLEVIATE FINANCIAL DEMANDS PLACED ON COUNTY SERVICES DUE TO WPPP.

WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

REVENUES AND IMPACTS
CITY OF ELY

FIGURE 4-25



REVENUES INCLUDE ALL TAX REVENUES AND IN LIEU OF AD VALOREM TAX REVENUES ATTRIBUTABLE TO WPPP.

SOCIAL IMPACTS INCLUDE ALL COSTS NECESSARY TO ALLEVIATE FINANCIAL DEMANDS PLACED ON SCHOOL DISTRICT SERVICES DUE TO WPPP.

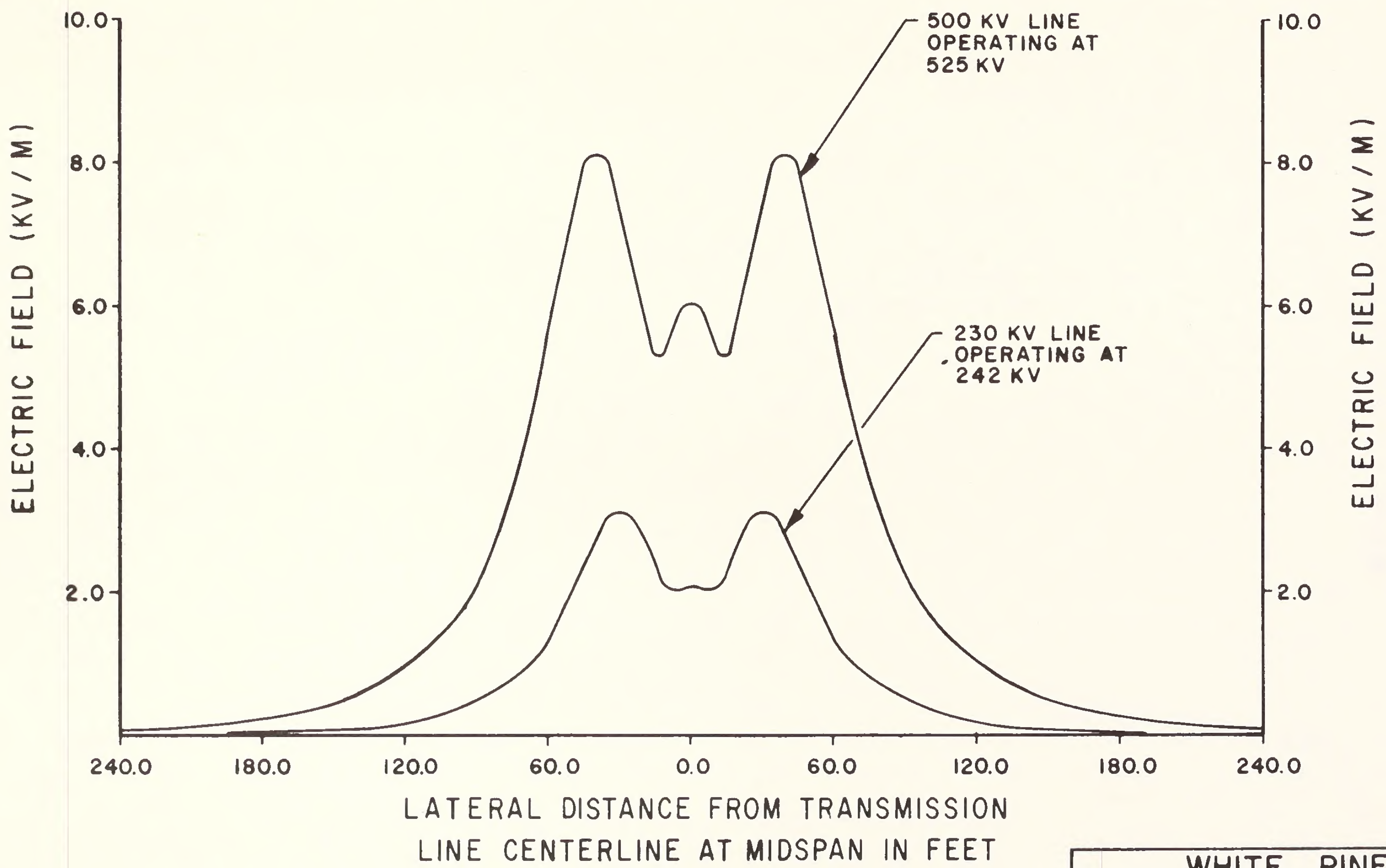
WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

REVENUES AND IMPACTS
WHITE PINE COUNTY
SCHOOL DISTRICT

FIGURE 4-26

ELECTRIC FIELD PROFILE
3.3 FEET ABOVE GROUND



KV/M - KILOVOLTS PER METER

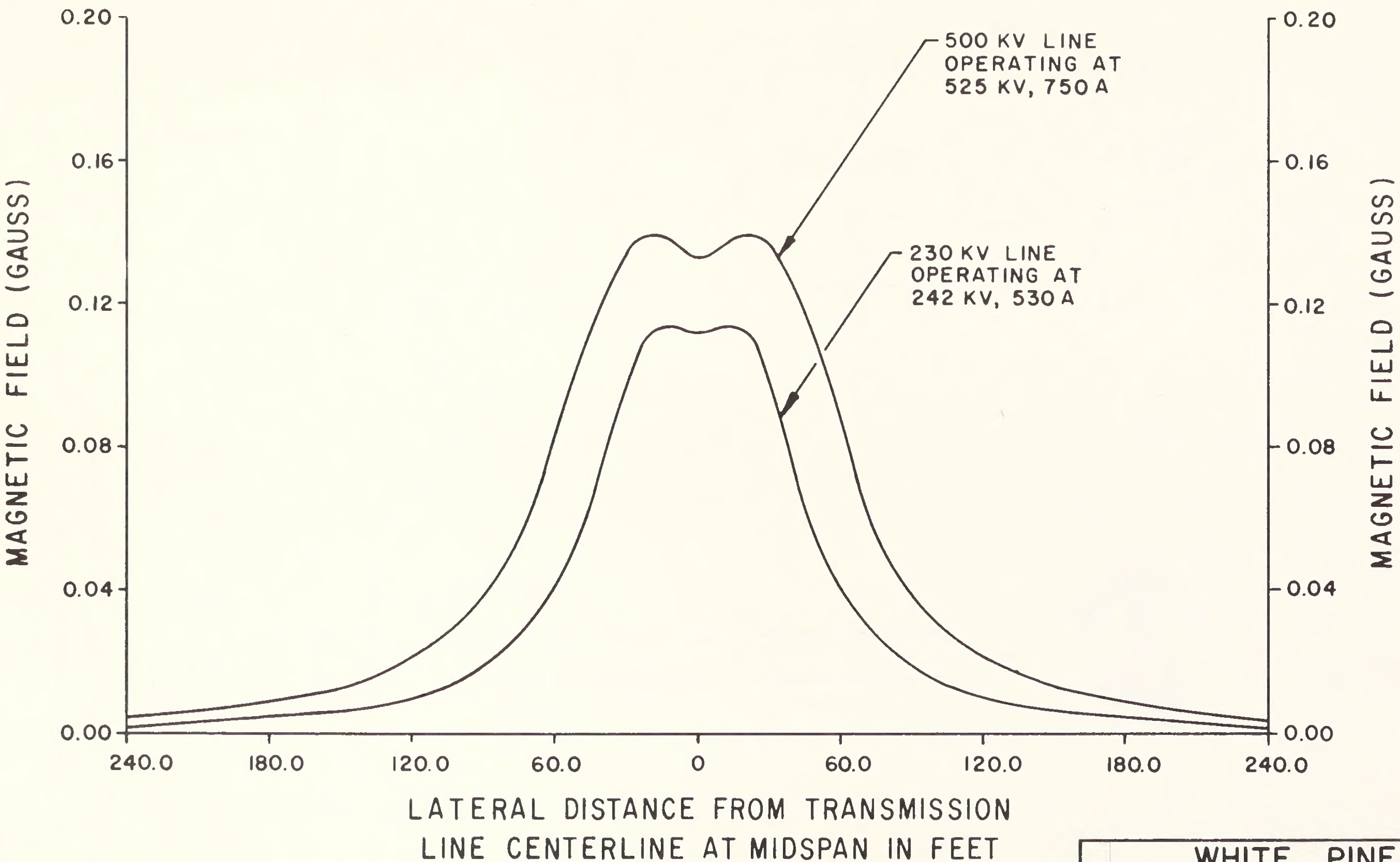
WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

ELECTRIC FIELDS
POWER TRANSMISSION LINES

FIGURE 4-27

MAGNETIC FIELD PROFILE
3.3 FEET ABOVE GROUND



WHITE PINE POWER PROJECT

ENVIRONMENTAL IMPACT STATEMENT

MAGNETIC FIELDS
POWER TRANSMISSION LINES

FIGURE 4-28

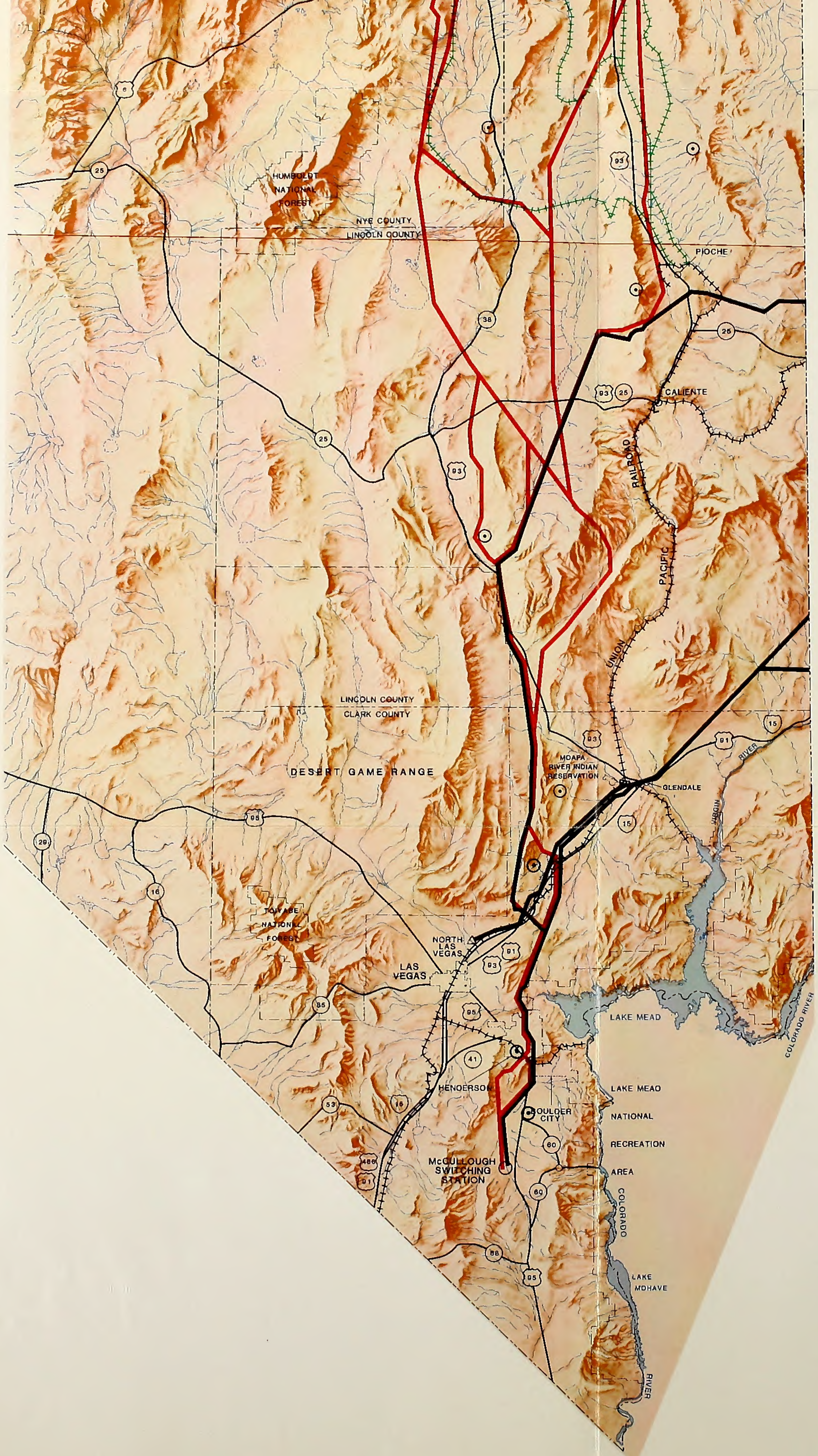
WHITE PINE POWER PROJECT

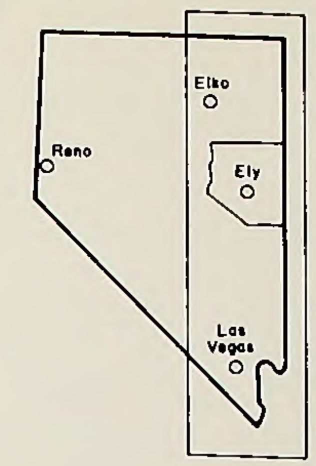
ENVIRONMENTAL IMPACT STATEMENT

TRANSMISSION LINE CORRIDORS
SOUTHERN NEVADA

FIGURE 5-1

HUMBOLDT NATIONAL FOREST
ELKO COUNTY
EUREKA COUNTY
ELKO
WELLS
SOUTHERN PACIFIC
UNION PACIFIC RAILROAD
PACIFIC
RAILROAD
COBRE
SHAFTER
SOUTH FORK INDIAN RESERVATION
HUMBOLDT NATIONAL FOREST
NEVADA NORTHERN RAILWAY
RUBY LAKE NATIONAL WILDLIFE REFUGE
ELKO COUNTY
WHITE PINE COUNTY
GOSHUTE INDIAN RESERVATION
NORTH STEPTOE VALLEY SITE
BUTTE VALLEY SITE
MACHACEK SUBSTATION
EUREKA
GONDER SUBSTATION
McGILL
RUTH
ELY
HUMBOLDT NATIONAL FOREST
TOIYABE NATIONAL FOREST
EUREKA COUNTY
NYE COUNTY
DUCKWATER INDIAN RESERVATION
PRESTON
LUND
SPRING VALLEY SITE
WHEELER PEAK
WHITE PINE COUNTY
LINCOLN COUNTY
N





LEGEND:

WPPP TRANSMISSION CORRIDORS

EXISTING AND PLANNED TRANSMISSION CORRIDORS

WPPP RAILROAD CORRIDORS

EXISTING RAILROAD

WPPP MICROWAVE SITE

WPPP ACCESS ROAD

0 5 10 15 20 25 MILES

0 10 20 30 40 KILOMETERS

WHITE PINE POWER PROJECT
STUDY AREA