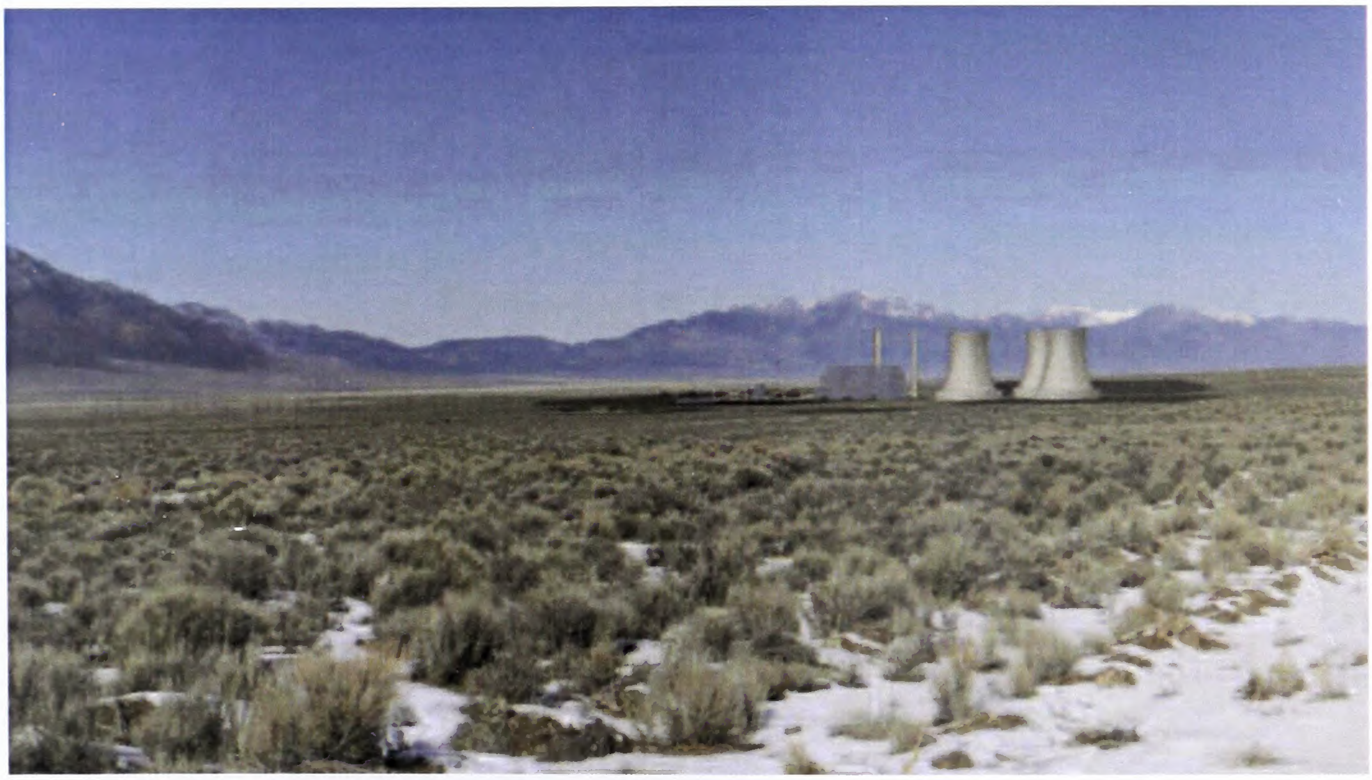
Draft Environmental Impact Statement for the White Pine Energy Station Project

DES 07-19



Volume 1

April 2007

BLM

Ely Field Office / Nevada

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BLM Mission Statement

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific and cultural values.

BLM/EL/ES 02/002+1793

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Ely Field Office
HC 33 Box 33500 (702 No. Industrial Way)
Ely, Nevada 89301-9408
http://www.nv.blm.gov/ely

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In Reply Refer To:
2850 (NV040)
N-78091

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Impact Statement (EIS) for the White Pine Energy Station Project. The EIS evaluates the environmental effects that would result from constructing and operating the White Pine Energy electric power generating plant proposed by White Pine Energy Associates, LLC, a wholly owned subsidiary of LS Power in St. Louis, Missouri. This approximately 1,590-megawatt coal-fired power plant and associated features would be located on public lands in White Pine County, eastern Nevada, that are presently managed by the Ely Field Office of the U.S. Bureau of Land Management. The power plant site for the Proposed Action is in the Steptoe Valley Hydrographic Basin, approximately 34 miles north of Ely, 22 miles north of McGill, and 1 mile west of U.S. 93.

Public comments concerning the adequacy and accuracy of this Draft EIS will be accepted until June 19, 2007, and must be submitted in writing to:

Bureau of Land Management
Ely Field Office
Jeffrey A. Weeks
HC 33, Box 33500
Ely, Nevada 89301-9408

Public meetings to accept verbal and written comments have also been scheduled for the following dates, times, and locations:

Date	Time	Location
May 8, 2007	6:00 to 9:00 p.m.	Bristlecone Convention Center, 150 6th St. Ely, Nevada
May 9, 2007	6:00 to 9:00 p.m.	Airport Plaza Hotel 1981 Terminal Way Reno, Nevada

Both written and oral comments received during the public comment period will be fully considered and evaluated for preparation of the Final EIS. If you would like any additional information, please contact Doris Metcalf, Ely Field Office at (775) 289-1852.

Sincerely,

John F. Ruhs
Field Manager

Draft Environmental Impact Statement for the White Pine Energy Station Project

(X) Draft ( ) Final

Lead Agency: United States Department of the Interior
Bureau of Land Management

Cooperating Agencies: National Park Service
Nevada Department of Wildlife
White Pine County, Nevada

Counties Directly Affected: White Pine County, Nevada

Environmental Impact Statement Contact:

Doris Metcalf
Ely Field Office

Correspondence on this Draft Environmental Impact Statement (Draft EIS) should be directed to:

Jeffrey A. Weeks
Bureau of Land Management, Ely Field Office
HC 33 Box 33500
Ely, Nevada 89301-9408

Date Draft EIS was filed with the U.S. Environmental Protection Agency: April 20, 2007

Date by which comments on this Draft EIS must be received to be considered in the Final EIS: June 19, 2007

Abstract

The Draft EIS evaluates the environmental effects that would result from constructing, operating, and maintaining the proposed White Pine Energy electric power generating plant. This approximately 1,590-megawatt coal-fired power plant and associated features would be located on public lands in White Pine County, eastern Nevada, that are presently managed by the Ely Field Office of the U.S. Bureau of Land Management (BLM). The Proposed Action and Alternative 1 include the following project actions and features: issue ROWs for White Pine Energy Station construction and operation and subsequently arrange for the sale of the power plant site to WPEA; construct, operate, and maintain an approximately 1,590-MW (maximum) coal-fired electric power generating plant using hybrid cooling systems that has an expected commercial life of 40 years or longer; develop a wellfield in the Steptoe Valley Hydrographic Basin to meet the water needs of the power plant; construct a new rail spur from the Nevada Northern Railway to the power plant site to supply coal; develop the linear infrastructure necessary to connect the power plant to the new water source, to existing electric transmission lines serving the region, and to provide site access; and implement a seeding project to enhance the grazing and wildlife value of 700 to 900 acres. The Proposed Action and Alternative 1 differ primarily in the location of the power plant site, wellfield, and transmission line alignment (northern vs. southern). The power plant site for the Proposed Action is in the Steptoe Valley Hydrographic Basin, approximately 34 miles north of Ely, 22 miles north of McGill, and 1 mile west of U.S. 93.

Federal actions addressed in the accompanying document are the BLM's issuance of rights-of-way needed to construct and operate the White Pine Energy Station Project and facilitate the ultimate sale of land for the power plant site. This Draft EIS satisfies the National Environmental Policy Act, which mandates that federal agencies analyze the environmental consequences of major undertakings.

Official responsible for the Environmental Impact Statement:

John F. Ruhs
Field Manager, Ely Field Office

4/6/07
Date

Draft Environmental Impact Statement for the White Pine Energy Station Project

U.S. Department of Interior
Bureau of Land Management
DES 07-19

Nevada State Office
April 2007

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Appendixes

Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
ACEC	Area of Critical Environmental Concern
ADT	average daily traffic
ADTT	average daily truck traffic
AEGL	acute exposure guideline levels
APE	Area of Potential Effect
n	nitrogen
bgs	below ground surface
BLM	Bureau of Land Management
BMPs	best management practices
BP	Before Present
BPI	Building Profile Input Program
CFR	Code of Federal Regulations
cfs	cubic feet per second
dBA	A-weighted decibels
DEIS	Draft Environmental Impact Statement
DOI	U.S. Department of the Interior
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Act
FLM	Federal Land Manager
FLPMA	Federal Land Policy and Management Act
FWS	U.S. Fish and Wildlife Service
FY	fiscal year
gal/day/ft	gallons per day per foot
GIS	geographic information system
gpd/ft	gallons per day per foot

gpm	gallons per minute
HAP	hazardous air pollutant
HMA	herd management area
HWI	Hawkwatch International
IPP	Intermountain Power Project
ISA	Instant Study Area
ITA	Indian Trust assets
IWAQM	Inter-Agency Work Group on Air Quality Monitoring
kg/ha.yr	kilogram per hectare per year
KOP	Key Observation Point
kV	kilovolt
LOS	Level of Service
$\mu g/m^3$	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act
MMBTU	million BTU
MP	milepost
MRL	Minimal Risk Levels
MW	megawatt
NAAQs	National Ambient Air Quality Standards
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NHT	National Historic Trail
NIEHS	National Institute of Environmental Health Sciences
NNHP	Nevada Natural Heritage Program
NNR	Nevada Northern Railway
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statute
NSPS	New Source Performance Standards

NWI	National Wetlands Inventory
NWP	Nationwide Permit Program
PCB	polychorinated biphenyls
PM_{10}	particulate matter with mean aerometric diameter smaller then 10 microns
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
RV	recreational vehicle
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCR	selective catalytic reduction
SHPO	State Historic Preservation Office
SIL	significant impact level
SNWA	Southern Nevada Water Authority
SPCCP	Spill Prevention, Control, and Countermeasure Plan
SR	State Route
SWIP	Southwest Intertie Project
TCP	traditional cultural property
TDS	total dissolved solids
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDI	U.S. Department of the Interior
USFS	U.S. Forest Service
USGS	United States Geological Survey
VOCs	volatile organic compounds
VRM	Visual Resource Management
WA	Wilderness Area
WMA	Wilderness Management Area
WPES	White Pine Energy Station
WPEA	White Pine Energy Associates, LLC
WSA	Wilderness Study Area

ES.0 Executive Summary

The following sections summarize the *Draft Environmental Impact Statement (DEIS) for the White Pine Energy Station Project*. This summary provides a general overview of the proposed project and its purpose and need; briefly describes the Proposed Action and other alternatives; summarizes major impacts for key resources associated with the Proposed Action, Alternative 1, and the No Action Alternative; and lists key consultation and coordination activities.

ES.1 Introduction

ES.1.1 General Overview

The Proposed Action and Alternative 1 for the White Pine Energy Station (the Station) were developed in response to a proposal by White Pine Energy Associates, LLC, (WPEA) to construct, own, operate, and maintain an approximately 1,590-megawatt (MW) coal-fired electric power generating plant in White Pine County in eastern Nevada. The power plant and associated features (electric transmission facilities, water supply system, electric distribution line, rail spur, access roads, additional construction sites, and Moriah Ranches Seeding Project) would be located primarily on lands managed by the Ely Field Office of the U.S. Department of the Interior Bureau of Land Management (BLM) (see Figure ES-1).

The power plant site for the Proposed Action is in Steptoe Valley, approximately 34 miles north of Ely, 22 miles north of McGill, and 1 mile west of U.S. Highway 93 (U.S. 93). Steptoe Valley is bordered on the east by the Schell Creek Range and on the west by the Egan Range. The Utah border is approximately 43 miles east and the northern boundary of Great Basin National Park approximately 57 miles southeast of the Proposed Action power plant site. An alternative power plant site (Alternative 1), also in Steptoe Valley, is approximately 12 miles south of the Proposed Action power plant site and 1 mile west of U.S. 93.

ES.1.2 Purpose

The purpose of the White Pine Energy Station is to supply reliable, low-cost electricity in an environmentally responsible manner to meet baseload energy needs in Nevada and the western United States, and to bring economic benefits to White Pine County, Nevada. To achieve this purpose, the Station must: (1) utilize commercially proven and reliable technology; (2) be cost-effective; (3) be located in proximity to infrastructure and water supplies in White Pine County needed to support the Station's operations; (4) put water rights held by White Pine County for energy production in Steptoe Valley to a beneficial use in producing energy; and (5) provide traffic for the Nevada Northern Railway (NNR).

ES.1.3 Need and Background

Adequate and reliable electricity supply is essential to the well-being of the American people and the economy. The construction of new power generation and transmission facilities is required to meet increasing demands for electricity. The White Pine Energy Station is being developed to serve baseload electric needs.

The Western Electricity Coordinating Council forecasts that "reported generating capacity additions in the region may not be sufficient to reliably supply the forecast firm peak demand and energy requirements throughout the [2005-2014] period" (Western Electricity Coordinating

Council, 2005). The Energy Information Administration (2006) forecasts the need for approximately 24,000 MW of new power generation in the western United States by 2015 (78,000 MW by 2030) to meet growing energy needs and maintain reliable operation of the electric system. The Energy Information Administration (2006) estimates that new coal-fired generation facilities will supply 5,700 MW by 2015 (47,000 MW by 2030) of this need for new generation capacity.

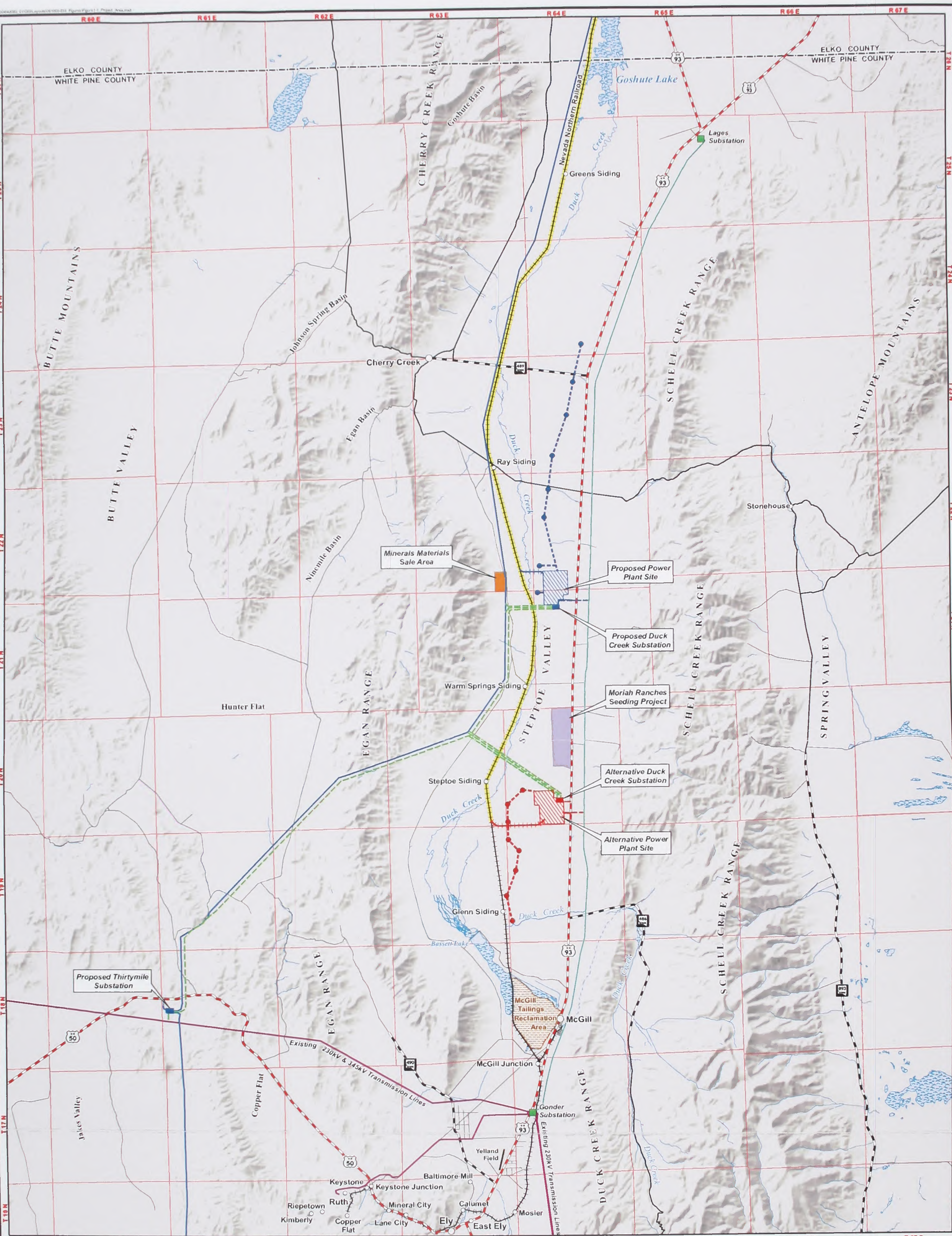
In Nevada, Nevada Power Company (2006) and Sierra Pacific Power Company (2006) have identified the need for approximately 5,500 MW of additional electric capacity beyond their existing generation capacity and secured purchases by 2015. The White Pine Energy Station would help fill part of the identified need for electricity by providing approximately 1,590 MW of new baseload coal-fired electric generation capacity.

Completion of the White Pine Energy Station also would help meet stated objectives of the Nevada State Office of Energy and Nevada electric utilities to increase fuel diversity in the State of Nevada. The addition of stable-priced, low-cost, coal-fired capacity would reduce the risk of reliance on volatile and more expensive natural gas-fired generation and the impacts of droughts on hydropower.

WPEA's proposal to locate the Station in Steptoe Valley approximately 34 miles (Proposed Action site) or 22 miles (Alternative 1 site) north of Ely is based on the following factors:

- The Station site is near the NNR, which would be used to supply coal to the power plant.
- The Station site is near a utility corridor that is permitted for a new 500,000-volt electric transmission line that would extend from Idaho to Clark County, Nevada. Access to this utility corridor provides a route to existing electric transmission facilities in White Pine County, specifically 345,000-volt and 230,000-volt transmission lines near Robinson Summit, and provides access to planned regional electric transmission facilities.
- The Station site is centrally located to the ground water source that would be used to supply the White Pine Energy Station's water needs. A reliable and economical water supply is central to a low-cost baseload, steam power plant and is available in the form of water rights held by White Pine County.
- The Station site can be easily accessed via U.S. 93 and is within a short driving distance to the population centers of Ely and McGill.
- The availability of a water supply was among the key factors in WPEA's decision to undertake the proposed Station and to site it at the proposed location in White Pine County.

Siting the Station in White Pine County, Nevada would meet long-held county objectives of attracting a coal-fired electric generation facility to bring needed and desired economic benefits to the county, strengthening and stabilizing the county economy, and improving the quality of life for county citizens. The Proposed Action and the other action alternative (Alternative 1) would put to beneficial use ground water rights granted to White Pine County by the Nevada State Engineer in Steptoe Valley for energy production purposes. The proposed Station also would help generate additional support for reactivating and upgrading the NNR, which would benefit the county's economy through recreational and industrial uses of the NNR.



Project Area
White Pine Energy Station Project

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Project Area
NEVADA

N
0 1.5 3 Miles
1:300,000 when printed at 11 x 17 inches

Figure ES-1

ES.2 Description of Proposed Action and Alternatives

ES.2.1 Proposed Action and Alternative 1

The Proposed Action and Alternative 1 were developed for the White Pine Energy Station and would each include a Power Station and would each include a Power Plant ROW and sale, Electric Transmission Facilities ROW, Water Supply System ROW, Rail Spur ROW, Access ROW, Additional Construction ROW, and Moriah Ranches Seeding Project. The Proposed Action and Alternative 1 would each include the following actions:

- Issue ROWs for construction and operation of the Station and subsequently arrange for the sale of the land covered by the Power Plant ROW to WPEA.
- Construction and operation of an approximately 1,590-MW coal-fired electric power generating plant using hybrid cooling systems that has an expected commercial life of 40 years or longer.
- Construction and operation of a water supply system in the Steptoe Valley Hydrographic Basin to meet the water needs of the power plant.
- Construction and operation of a new rail spur from the NNR to the power plant to supply coal.
- Construction and operation of electric transmission facilities to connect the power plant with existing and planned electric transmission facilities serving the region.
- Construction and operation of road access and certain utility access to the power plant and other Station features.
- Construction and operation of an electric distribution line for the supply of power during the construction period.
- Construction and operation of an off-site mineral materials sale area (borrow area) for the supply of earth and rock materials to be used in the construction process.
- Implementation of a seeding project to enhance the grazing and wildlife value on 700 to 900 acres.
- Implementation of best management practices (BMPs) during Station construction, operation, and maintenance to avoid or prevent the occurrence of impacts and, where possible, to minimize the magnitude, extent, and duration of those impacts when their occurrence can not be prevented.

Table ES-1 compares project components for the Station Proposed Action and Alternative 1.

ES.2.2 No Action Alternative

Under the No Action Alternative, Station-related ROWs would not be created, the land covered by the Power Plant ROW subsequently would not be sold to WPEA, and the Station power plant and related facilities would not be constructed or operated as described for the Proposed Action or Alternative 1.

ES.2.3 Preferred Alternative

BLM's Preferred Alternative is the Proposed Action.

TABLE ES-1

Comparison of Project Components for the White Pine Energy Station Proposed Action and Alternative 1

Project Component	Proposed Action	Alternative 1
BLM Action	Issue ROWs for construction and operation of all Station features on BLM-managed land. Subsequent sale of power plant site to WPEA	Issue ROWs for construction and operation of all Station features on BLM-managed land. Subsequent sale of power plant site to WPEA
Power Plant Construction	Construct and operate up to a three-unit, approximately 1,590-MW coal-fired, hybrid-cooled power plant	Construct and operate up to a three-unit, approximately 1,590-MW coal-fired, hybrid-cooled power plant
Power Plant Location	Sections 31 and 32, T22 North, R64 East and Sections 5 and 6, T21 North, R64 East in White Pine County, NV (Northern Site)	Sections 28, 29, 32 and 33, T20 North, R64 East in White Pine County, NV (Southern Site)
Electric Distribution and Transmission	Construct and operate a 32-mile-long overhead 500-kV transmission line connecting the Duck Creek Substation to the Thirtymile Substation. Construct and operate a 2.5-mile-long loop of the overhead 500-kV SWIP line connecting to the Duck Creek Substation.	Construct and operate a 28-mile-long overhead 500-kV transmission line connecting the Duck Creek Substation to the Thirtymile Substation. Construct and operate a 6-mile-long loop of the overhead 500-kV SWIP line connecting to the Duck Creek Substation.
Switchyards	Construct and operate the 60-acre Duck Creek Substation at the power plant and the 77-acre Thirtymile Substation near Robinson Summit	Construct and operate the 60-acre Duck Creek Substation at the power plant and the 77-acre Thirtymile Substation near Robinson Summit
Coal Supply Access	Construct and operate a 1.3-mile-long rail spur crossing Duck Creek and connecting to the upgraded NNR.	Construct and operate a 3-mile-long rail spur connecting to the upgraded NNR.
Power Plant Road Access	Construct and maintain a 1-mile-long paved access road from U.S. 93	Construct and maintain a 0.3-mile-long paved access road from U.S. 93
Ground Water Well Field	Construct and operate a system of 8 wells north of the power plant site	Construct and operate a system of 8 wells south of the power plant site
Well Field Pipelines	Construct and operate 13 miles of 10- to 30-inch-diameter water pipeline connecting the wells to the power plant	Construct and operate 8 miles of 10- to 30-inch-diameter water pipeline connecting the wells to the power plant
Well Field Electric Distribution Line and Access Road	Construct and operate 13 miles of 13.8-kV overhead distribution lines and a 10-foot-wide access road servicing each well site	Construct and operate 8 miles of 13.8-kV overhead distribution lines and a 10-foot-wide access road servicing each well site
Mineral Materials Sale Area	Use during construction, a 40-acre earth and rock borrow area in Section 35, T22 North, R63 East in White Pine County, NV.	Use during construction, a 40-acre earth and rock borrow area in Section 35, T22 North, R63 East in White Pine County, NV.
Moriah Ranches Seeding Project	Implement a seeding program on 700 to 900 acres to improve forage for livestock and wildlife on public lands 16 miles north of McGill and immediately west of U.S. 93	Implement a seeding program on 700 to 900 acres to improve forage for livestock and wildlife on public lands 16 miles north of McGill and immediately west of U.S. 93
Best Management Practices	Commitment to construct and operate the various Station features in accordance with a series of best management practices	Commitment to construct and operate the various Station features in accordance with a series of best management practices

ES.2.4 Alternatives Considered During Scoping but Eliminated from Further Consideration

A number of alternatives were considered during project scoping but were eliminated from detailed analysis because they failed to meet project purpose and need, were operationally infeasible, were economically infeasible, were environmentally unacceptable, and/or did not afford environemental advantages over the Proposed Action or Alternative 1. Alternative power generating technologies and fuels were eliminated because they did not meet one or more of the following six key criteria that were developed to evaluate the technical and economic feasibility, environmental soundness, and ability of the alternative energy technologies to meet project purpose and need:

- Capable of providing approximately 1,590 MW of reliable baseload power generation capacity
- Environmentally permitable
- Cost effectiveness relative to pulverized coal
- Commercially proven and reliable
- Place water held by White Pine County for power production in Steptoe Valley to beneficial use for power production
- Provide traffic for the NNR

Alternative power plant locations were eliminated because they were infeasible from engineering (infrastructure needs versus availability) and economic (construction and operational costs) perspectives, would result in unacceptable environmental and socioeconomic impacts, and/or did not afford environemental advantages over the Proposed Action or Alternative 1. Alternative power plant designs and site configurations, rail spur locations, bridge designs for crossing Duck Creek, and well field electric distribution lines alignment and design were considered but eliminated from detailed analysis primarily because of unacceptable environmental impacts to biological resources and potentially to cultural resources. An alternative power plant cooling technology was considered but eliminated from detailed analysis because of potential impacts to ground water. Alternative transmission line routes were eliminated because of engineering and environmental issues and concerns (inconsistent with land use plan, conflict with private property, need for multiple power lines, and viewshed impacts).

ES.3 Affected Environment and Environmental Consequences

ES.3.1 Proposed Action and Action Alternatives

Table ES-2, at the end of this chapter, summarizes major impacts, including unavoidable adverse impacts, anticipated under the Proposed Action and Alternative 1 by resource. Unavoidable adverse impacts on resources are those residual impacts remaining after implementation of mitigation measures. These impacts would primarily be associated with lands that would be disturbed and/or included in construction ROWs. Under the Proposed Action, 1,902 acres would be temporarily disturbed by Station construction and 1,510 acres would be permanently disturbed by Station operations. The power plant ROW that the BLM would subsequently sell to WPEA would make up 1,281 acres of the permanently disturbed acres under the Proposed Action. Under Alternative 1, 1,946 acres would be temporarily disturbed and 1,569 acres would be permanently disturbed. The power plant ROW would make up 1,330 acres of the permanently disturbed acres under Alternative 1. Although the power plant parcels have been identified for disposal by the BLM, their transferal from public to private ownership would preclude the continuation of existing land uses (some recreation, grazing) on the fenced site.

TABLE ES-2

Summary of Impacts by Resource for the White Pine Energy Station Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
3.2 and 4.2*—Geology, Soils, and Minerals		
1,902 acres of soil disturbed during construction. 1,510 acres permanently disturbed.	1,946 acres of soil disturbed during construction. 1,569 acres permanently disturbed.	No Station-related impacts would occur.
3.3 and 4.3*—Surface Water Resources		
No effect	No effect	No Station-related impacts would occur.
3.4 and 4.4*—Ground Water Resources		
Lowers ground water level near production wells. No effect on existing wells but may affect 12 areas where springs are present. This will be monitored and mitigated.	Lowers ground water level near production wells. No effect on existing wells or springs.	No Station-related impacts would occur.
3.5.1 and 4.5.1*—Biological Resources: Vegetation		
395 acres of vegetation temporarily disturbed during construction. 1,516 acres of vegetation permanently disturbed.	378 acres of vegetation temporarily disturbed during construction. 1,534 acres of vegetation permanently disturbed.	No Station-related impacts would occur.
3.5.2 and 4.5.2*—Biological Resources: Noxious and Invasive Weeds		
Potential for spread of noxious and invasive weeds but minimized by BMPs	Potential for spread of noxious and invasive weeds but minimized by BMPs	No Station-related impacts would occur.
3.5.3 and 4.5.3*—Biological Resources: Wildlife and Fisheries Resources		
395 acres of wildlife habitat disturbed during construction. 1,516 acres of wildlife habitat permanently disturbed. No effect on fisheries. The Moriah Ranches Seeding Project would enhance wildlife value on 700 to 900 acres.	378 acres of wildlife habitat disturbed during construction. 1,534 acres of wildlife habitat permanently disturbed. No effect on fisheries. The Moriah Ranches Seeding Project would enhance wildlife value on 700 to 900 acres.	No Station-related impacts would occur.
3.5.4 and 4.5.4*—Biological Resources: Threatened, Endangered, Candidate, and Sensitive Species		
Potential to affect special status species because of loss of habitat. May affect but not likely to adversely affect bald eagles.	Potential to affect special status species because of loss of habitat. May affect but not likely to adversely affect bald eagles.	No Station-related impacts would occur.

TABLE ES-2

Summary of Impacts by Resource for the White Pine Energy Station Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
3.6.1 and 4.6.1*—Air Quality		
Minimal impacts during construction; the primary issue would be fugitive dust, which would be controlled by water spray on disturbed areas. Emissions during Station operations would meet PSD permit requirements, including a modeled demonstration that ambient impacts would be within applicable air quality standards, but some potential exceedances of visibility criteria may occur in Jarbidge Wilderness Area and Zion National Park. While Great Basin National Park and Ruby Lake National Wildlife Refuge are not PSD Class I areas, the dispersion modeling also demonstrates that acid deposition and visibility criteria may be exceeded in these locations if managed to Class I standards.	Minimal impacts during construction; the primary issue would be fugitive dust, which would be controlled by water spray on disturbed areas. Emissions during operations would meet PSD permit requirements, including a modeled demonstration that ambient impacts would be within applicable air quality standards, but some potential exceedances of visibility criteria may occur in Jarbidge Wilderness Area and Zion National Park. While Great Basin National Park and Ruby Lake National Wildlife Refuge are not PSD Class I areas, the dispersion modeling also demonstrates that acid deposition and visibility criteria may be exceeded in these locations if managed to Class I standards.	No Station-related impacts would occur.
3.6.2 and 4.6.2*—Noise		
Highest noise level during construction estimated at 74 dBA at nearest receptor. This level would be short term and result from steam blowouts. Noise from operations would be below background levels.	Lower potential impact than for Proposed Action because nearest receptor further away. Noise from operations would be below background levels.	No Station-related impacts would occur.
3.7 and 4.7*—Visual Resources		
The power plant, particularly the stacks and cooling towers, and transmission towers would be visible from much of Steptoe Valley. However, all features would meet VRM class objectives except for one location.	The power plant, particularly the stacks and cooling towers, and transmission towers would be visible from much of Steptoe Valley. However, all features would meet VRM class objectives except for one location.	No Station-related impacts would occur.
3.8 and 4.8*—Recreation Resources		
The increase in number of workers during construction and operation would increase the use of recreation resources in the Station project area.	The increase in number of workers during construction and operation would increase the use of recreation resources in the Station project area.	No Station-related impacts would occur.
3.9 and 4.9*—Land Use		
All facilities would be on BLM-administered land. Proposed ROWs would be shared with some other ROW holders. The proposed Station facilities comply with federal and local land use policies.	Nearly all facilities would be on BLM-administered land. Proposed ROWs would be shared with some other ROW holders. The proposed Station facilities comply with federal and local land use policies.	No Station-related impacts would occur.

TABLE ES-2

Summary of Impacts by Resource for the White Pine Energy Station Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
3.10 and 4.10*—Rangeland Resources		
The Moriah Ranches Seeding Project would enhance grazing value on 700 to 900 acres.	The Moriah Ranches Seeding Project would enhance grazing value on 700 to 900 acres.	No Station-related impacts would occur.
3.11 and 4.11*—Wilderness and Areas of Critical Environmental Concern		
No Wilderness or Areas of Critical Environmental Concern would be affected by the Station.	No Wilderness or Areas of Critical Environmental Concern would be affected by the Station.	No Station-related impacts would occur.
3.12 and 4.12*—Wastes, Hazardous and Solid		
The Station would result in a solid waste disposal area being constructed and operated at the power plant site and would be permanently located there. Some hazardous materials would be stored on the power plant site.	The Station would result in a solid waste disposal area being constructed and operated at the power plant site and would be permanently located there. Some hazardous materials would be stored on the power plant site.	No Station-related impacts would occur.
3.13 and 4.13*—Cultural Resources		
One prehistoric site and a segment of the Nevada Northern Railroad would be disturbed that are considered eligible for the National Register of Historical Places (NRHP). In addition, three prehistoric sites eligible for the NRHP are located in the Thirtymile Substation area. Up to six historic ranches, two points along the Lincoln Highway and two points along the NNR would be subject to high indirect visual impacts.	A segment of the Nevada Northern Railroad would be reconstructed that is considered eligible for the NRHP. Four prehistoric properties would be affected by project features in Steptoe Valley. In addition, three prehistoric sites eligible for the NRHP are located in the Thirtymile Substation area. One point along the Lincoln Highway and three points along the NNR would be subject to high indirect visual impacts.	No Station-related impacts would occur.
3.15 and 4.15*—Native American Religious Concerns		
None were identified	None were identified	No Station-related impacts would occur.
3.14 and 4.14*—Environmental Justice		
No impacts	No impacts	No Station-related impacts would occur.
3.16 and 4.16*—Paleontological Resources		
None identified	None identified	No Station-related impacts would occur.

TABLE ES-2

Summary of Impacts by Resource for the White Pine Energy Station Proposed Action, Alternative 1, and No Action Alternative

Proposed Action	Alternative 1	No Action Alternative
3.17 and 4.17*—Socioecomics		
Economic benefits to White Pine County would result from the Station. Local infrastructure would be stressed during construction but Station construction commitments, including provision of onsite housing for construction workers, would prevent most impacts.	Economic benefits to White Pine County would result from the Station. Local infrastructure would be stressed during construction but Station construction commitments, including provision of onsite housing for construction workers, would prevent most impacts.	No Station-related impacts would occur.
3.18 and 4.18*—Transportation		
Traffic on U.S. 93 would increase during Station construction but not reduce the Level of Service class. The NNR is to be upgraded to Class 3 status and accommodate 12 coal trains to and from the power plant per week.	Traffic on U.S. 93 would increase during Station construction but not reduce the Level of Service class. The NNR is to be upgraded to Class 3 status and accommodate 12 coal trains to and from the power plant per week.	No Station-related impacts would occur.

*Refers to detailed resource discussions in EIS sections of Chapter 3 (Affected Environment) and Chapter 4 (Environmental Consequences).

Other affected or potentially affected resources would include soils; several special status plant and animal species; plant species and vegetative cover; and various wildlife species and their habitat. Use of ground water for the Proposed Action (but not Alternative 1) may potentially reduce flows and water levels at 12 nearby areas where springs are present and adversely affect one species of special status aquatic springsnail and possibly other wildlife and plant species associated with spring environments.

Other Station-related effects would include the presence of construction vehicles, equipment, personnel, and activities, and associated fugitive dust emissions during construction. Emissions during Station operations would meet PSD permit requirements, but some potential exceedances of visibility criteria may occur in Jarbidge Wilderness Area and Zion National Park. While Great Basin National Park and Ruby Lake National Wildlife Refuge are not PSD Class I areas, dispersion modeling also demonstrates that acid deposition and visibility criteria may be exceeded in these locations if managed to Class I standards. Also, constructed Station features would not comply with the BLM's designated VRM Classes when viewed from one location each for the Proposed Action and Alternative 1.

Related visual impacts of project features on the historic integrity of several historical resources (NNR, Magnuson Ranch rest stop, Whiteman Ranch, and Lincoln Highway) could be minimized but not entirely mitigated. Another possible unavoidable adverse impact on cultural resources would be their accidental disturbance if inadvertently encountered during construction. Station effects on transportation would include traffic increases during Station construction on highways that are considered potential access routes to the proposed power plant sites but no change in the Level of Service class for these highways.

Overall, development of the White Pine Energy Station would result in a range of economic benefits to White Pine County. These benefits include, but are not limited to, local income and job creation, generation of tax revenue, and the development of a reliable and affordable source of power. Also, the Station would help diversify the local economy, resulting in less dependence on the boom-and-bust cycle of the mining industry. Economic benefits would likely also extend outside of the county based on purchases of goods and services during Station construction and operations, as well as power-related benefits. These economic benefits would be derived, in part, from putting to beneficial use water rights held by White Pine County and re-establishment of the NNR. Construction of the proposed White Pine Energy Station would result in the irreversible and irretrievable commitments of some resources. Irreversible impacts would include labor, capital, some construction materials, fuels, and ground water. Irretrievable impacts on environmental resources would generally not extend past the life of the Station. Affected resources would include biological resources, air quality and noise, soils, ground water, visual and recreation resources, land use, possibly cultural resources, and socioeconomics.

ES.3.2 No Action Alternative

If the No Action Alternative is selected for implementation, existing conditions and trends for the affected environment in the Station project area would continue. The purposes and needs that were identified for the proposed Station would not be met. Under the No Action Alternative, water rights held by White Pine County for energy production in Steptoe Valley may not be placed to a beneficial use and may be subject to forfeit by the Nevada State Engineer. Additional traffice on the NNR may be forgone, challenging the economic feasibility of rehabilitation of the line by the City of Ely.

ES.4 Consultation and Coordination

Public scoping meetings for the White Pine Energy Station were held in Ely on August 23, 2004, and in Reno on August 24, 2004. Meeting objectives were to learn the concerns of individuals, organizations, and agencies regarding the proposed Station and to allow interested parties to participate in developing a list of issues to be addressed in the EIS.

The meetings were publicized through newspaper advertisements and individual mailings. On August 13 and August 20, 2004, advertisements were published in the *Ely Times* and the *Reno Gazette-Journal*. Mailings were sent to 210 addresses. The meetings were conducted using an open-house format. At each meeting, WPEA, EIS contractor, and BLM representatives presented Station information on display boards and handouts, and discussed concerns with individuals. The Ely meeting was attended by 42 people, and the Reno meeting was attended by 11 people.

Individuals, public agencies, and non-profit organizations submitted written comments to the BLM after the meetings. Thirty-five letters containing 231 comments were received. Most commentors expressed concerns regarding potential impacts of the proposed power plant on local resources and suggested the following issues should be addressed in the EIS: air quality; water development, use, and ground water; wildlife, habitat, and ecological concerns; socioeconomics, visual resources, and recreation; transportation, roads, and railroad; power need and recipients; proposed site, alternatives, and transmission lines; energy efficiency, conservation, and alternative energy; waste and hazardous materials, and; power plant technology and noise.

Numerous federal, state, and county agencies, and Native American Tribes were consulted during the preparation of this DEIS. BLM representatives initiated formal and informal communication with Native American Tribal representatives in the Station project area to discuss the proposed White Pine Energy Station. This process provided Tribes the opportunity to identify potential effects of the Station on Native American interests. A Native American coordination meeting was conducted on December 8, 2004, in the BLM Ely Field Office with representatives from the Ely Shoshone Tribe, Duckwater Shoshone Tribe, WPEA, and the Ely Field Office. Station details were presented to the group by WPEA, followed by a discussion of issues and concerns. Subsequent to the meeting in December, BLM Ely Field Office staff have remained in communication with the Tribes regarding the Station. The most recent meeting with the Tribes was in July 2006. Another meeting with the Tribes is anticipated to coincide with the release of this DEIS to the public for review and comment. To date, no issues or concerns have been raised by the Tribes regarding any religious or traditional cultural properties that might be impacted by the Proposed Action or Alternative 1.

This DEIS has been sent to, and comments requested from, the general public and entities including federal, state, and local governments; Tribal governments; other organizations; and Members of the U.S. Congress and the Governor of Nevada. This DEIS is available at numerous public libraries and BLM offices.

Two public meetings will be held to receive comments on this DEIS. Dates and locations of these meetings are as follows:

- May 8, 2007, Ely, Nevada
- May 9, 2007, Reno, Nevada

Chapter 1.0 Introduction

1.1 General Overview

This document presents the Draft Environmental Impact Statement (DEIS) for the proposed White Pine Energy Station (also referred to as the Station) in White Pine County in eastern Nevada. The Proposed Action and alternatives evaluated in this document were developed in response to a proposal by White Pine Energy Associates, LLC, (WPEA) to construct, own, operate, and maintain an approximately 1,590-megawatt (MW) coal-fired electric power generating plant. The power plant and associated features (electric transmission facilities, water supply system, electric distribution line, rail spur, and access roads) would be located primarily on lands managed by the Ely Field Office of the U.S. Department of the Interior Bureau of Land Management (BLM). This document evaluates the BLM action and potential environmental effects that would result from the issuance of Rights-of-Way (ROWs) and the ultimate sale of the power plant site under the Federal Land Policy and Management Act (FLPMA) for the construction, operation, and maintenance of the electric power generating plant, electric transmission lines and substations, wellfield and water pipeline, electric distribution line, railroad spur, access roads, and ancillary features. The power plant site would subsequently be sold to WPEA.

This document was prepared in compliance with the Council on Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA) (40 CFR Sec. 1500-1508); the *NEPA Handbook*, H-1790-1; and the Ely Field Office *Environmental Analysis Guidebook*: Sections 201, 202, and 206 of FLPMA of 1976 (43 CFR Sec. 1600). The Ely, Nevada, Field Office of the BLM is the federal lead agency in the NEPA process and development of this document. The National Park Service, Nevada Department of Wildlife, and White Pine County, Nevada, are cooperating agencies.

1.2 Purpose, Need, and Background

1.2.1 Introduction

The construction of new power generation facilities is required throughout the western United States to meet the increasing demand for power resulting from population growth, business expansion, and other factors.

The western United States is projected to have the largest percent change in population of any region with an estimated 45.8 percent growth between 2000 and 2030 (Census Bureau, 2005). Nevada has the fastest rate of population growth in the United States and the demand for power continues to increase. Population increases and economic growth in Nevada will result in a demand for electricity that cannot be met with existing power generation resources.

According to Executive Order 13212, May 18, 2001, "The increased production and transmission of energy in a safe and environmentally sound manner is essential to the well-being of the American people…agencies shall take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy."

WPEA is proposing the White Pine Energy Station in White Pine County, Nevada, to help meet baseload electricity demand in Nevada and the western United States. WPEA is proposing to locate the

White Pine Energy Station on federally administered lands managed by the BLM.

1.2.2 Purpose

The purpose of the White Pine Energy Station is to supply reliable, low-cost electricity in an environmentally responsible manner to meet baseload energy needs in Nevada and the western United States, and to bring economic benefits to White Pine County, Nevada. To achieve this purpose, the Station must: (1) utilize commercially proven and reliable technology; (2) be cost-effective; (3) be located in proximity to infrastructure and water supplies in White Pine County needed to support the Station's operations; (4) put water rights held by White Pine County for energy production in Steptoe Valley to a beneficial use in producing energy; and (5) provide traffic for the Nevada Northern Railway (NNR).

1.2.3 Need and Background

Adequate and reliable electricity supply is essential to the well-being of the American people and the economy. The construction of new power generation and transmission facilities is required to meet increasing demands for electricity.

Electricity demand varies on an instantaneous, daily, and seasonal basis as a function of the usage of electrical devices. Generally, the most economical and reliable means of supplying electric load is to have three types of generating facilities: baseload facilities; intermediate load facilities; and peaking load facilities. The White Pine Energy Station is being developed to serve baseload electric needs.

Baseload facilities operate near full capacity 24 hours per day and must be efficient, highly reliable, and economize fuel. Large-scale generating facilities fueled by coal, nuclear, or hydropower typically serve baseload energy needs in the most economical manner. Intermediate load facilities operate seasonally and in a cycling fashion, and typically have a higher operating cost than baseload facilities. Natural gas-fired combined-cycle generating facilities have become a predominant supplier of intermediate energy needs. Wind, hydropower, gas steam boilers, and smaller coal-fired plants also can serve intermediate energy needs. Peaking load facilities operate only during peak demand periods and during emergencies because of their higher operating costs relative to baseload and intermediate load facilities. Peaking facilities include quick-start natural gas and oil-fired combustion turbines, diesel generators, natural gas and oil-fired steam boilers, and hydropower.

The Energy Information Administration forecasts that coal-fired plants will make up most of the capacity additions during the forecast period. Specifically, in the western United States, the Energy Information Administration states that the choice to build mostly coal-fired plants is based on the region's lower-than-average coal prices and higher-than-average natural gas prices (Energy Information Administration, 2006). The Western Electricity Coordinating Council forecasts that "reported generating capacity additions in the region may not be sufficient to reliably supply the forecast firm peak demand and energy requirements throughout the [2005-2014] period" (Western Electricity Coordinating Council, 2005).

The Energy Information Administration forecasts energy needs through 2030. The Energy Information Administration (2006) forecasts the need for approximately 24,000 MW of new power generation in the western United States by 2015 (78,000 MW by 2030) to meet growing energy needs and maintain reliable operation of the electric system. The Energy Information Administration (2006) estimates that new coal-fired generation facilities will supply 5,700 MW by 2015 (47,000 MW by 2030) of this need for new generation capacity. In Nevada, Nevada Power Company (2006) and Sierra Pacific Power Company (2006) have identified the need for approximately 5,500 MW of additional electric capacity beyond their existing generation capacity and secured purchases by 2015. The White Pine Energy Station would help fill part of the identified need for electricity by providing approximately 1,590 MW of new baseload coal-fired electric generation capacity.

Completion of the White Pine Energy Station also would help meet stated objectives of the Nevada State Office of Energy and Nevada electric utilities to increase fuel diversity in the State of Nevada. The addition of stable-priced, low-cost, coal-fired capacity would reduce the risk of reliance on volatile and more expensive natural gas-fired generation and the impacts of droughts on hydropower.

WPEA's proposal to locate the Station in Steptoe Valley approximately 34 miles (proposed site) or 22 miles (alternative site) north of Ely is based on the following factors:

- The proposed site is near the NNR, which would be used to supply coal to the power plant.
- The proposed site is near a utility corridor that is permitted for a new 500,000-volt electric transmission line that would extend from Idaho to Clark County, Nevada. Access to this utility corridor provides a route to existing electric transmission facilities in White Pine County, specifically 345,000-volt and 230,000-volt transmission lines near Robinson Summit, and provides access to planned regional electric transmission facilities.
- The site is centrally located to the ground water source that would be used to supply the White Pine Energy Station's water needs. A reliable and economical water supply is central to a low-cost baseload, steam power plant and is available in the form of water rights held by White Pine County.
- The proposed site can be easily accessed via U.S. Highway 93 (U.S. 93) and is within a short driving distance to the population centers of Ely and McGill.
- The availability of a water supply was among the key factors in WPEA's decision to undertake the proposed project and to site it at the proposed location in White Pine County.

Siting the Station in White Pine County, Nevada, would meet long-held county objectives of attracting a coal-fired electric generation facility to bring needed and desired economic benefits to the county, strengthening and stabilizing the county economy, and, therefore, improving the quality of life for county citizens. The Proposed Action and the other action alternative (Alternative 1) would put to beneficial use ground water rights granted to White Pine County by the Nevada State Engineer in Steptoe Valley for energy production purposes. If these rights are not put to beneficial use, White Pine County is at risk of having the rights withdrawn by the State Engineer. The proposed project also would help generate additional support for reactivating and upgrading the NNR, which would benefit the county's economy through recreational and industrial uses of the NNR.

White Pine County is approximately 93 percent public land and its economy has historically relied on the boom-bust cycles of the mining industry. This has resulted in significant fluctuations in population, employment, tax base, and revenues. Specifically, with the closing of the Robinson Copper Mine in 1999, White Pine County has seen its population decrease from 10,134 in 1996 to 8,842 in 2003 (Nevada State Demographer's Office, 2006) and its labor force decrease from 4,337 in 1995 to 3,694 in 2003 (Nevada Department of Employment, Training & Rehabilitation, 2006). Likewise, White Pine County has seen the assessed valuation of its tax base decrease from $173,614,000 in 1999-2000 to $126,300,000 in 2003-2004. The county's median household income of $36,622 in 2003 was the fourth lowest in Nevada and ranks below the state and national averages of $45,249 and $43,318, respectively. More recently, with the re-opening of the Robinson Copper Mine in 2004, the population has increased to 9,275 in 2005 and the labor force has increased to 4,300 in 2005. The construction and operation of the White Pine Energy Station would provide a steady, long-term positive effect on employment opportunities, tax revenues, household incomes, and sales of local goods and services in the county.

In 1983, to facilitate such a project, the county secured 25,000 acre-feet of water rights for power generation purposes and has since been maintaining these water rights with regular filings with the State Engineer of Nevada. In February 2004, White Pine County entered into an agreement granting WPEA the exclusive right to use these water rights for development and operation of the White Pine Energy Station. The Station would use up to 5,000 acre-feet of water per year.

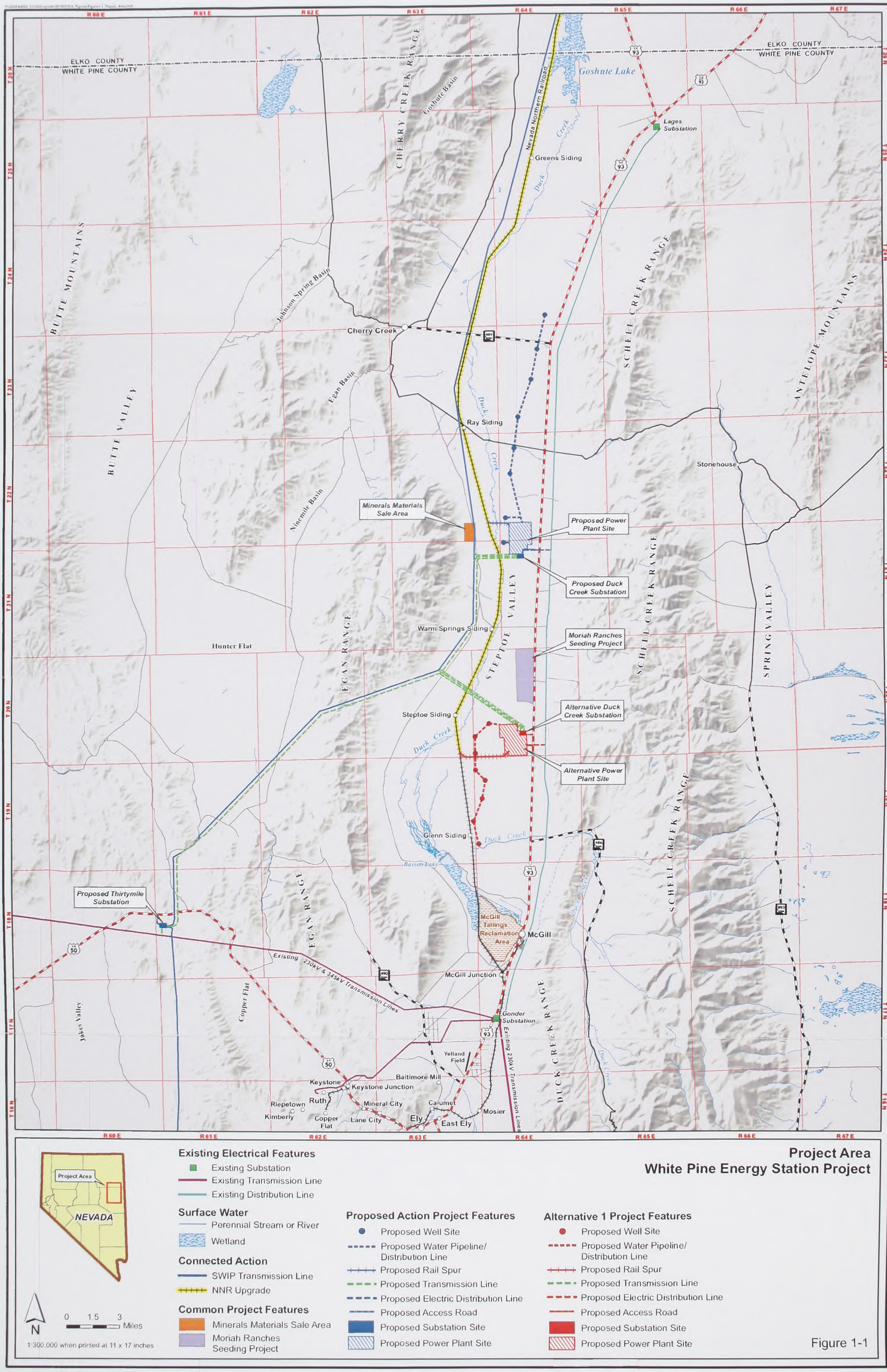
1.3 Project Location

The White Pine Energy Station site is located in White Pine County in eastern Nevada primarily on public lands managed by the Ely Field Office of the BLM (see Figure 1-1). The power plant site for the Proposed Action is in the Steptoe Valley Hydrographic Basin, approximately 34 miles north of Ely, 22 miles north of McGill, and 1 mile west of U.S. 93. The Steptoe Valley is bordered on the east by the Schell Creek Range and on the west by the Egan Range (approximately 8 miles and 5 miles from the Proposed Action power plant site, respectively). The Utah border is approximately 43 miles east and the northern boundary of Great Basin National Park approximately 57 miles southeast of the Proposed Action power plant site. An alternative power plant site (Alternative 1), also in Steptoe Valley, is approximately 12 miles south of the Proposed Action power plant site and 1 mile west of U.S. 93.

1.4 Policies, Plans, and Programs

1.4.1 Relationships to BLM Policies, Plans, and Programs

The BLM is responsible for managing the lands requested for use by WPEA for the White Pine Energy Station. WPEA's proposed use of public land for the Station conforms to BLM's land management policies under the Egan Resource Management Plan, as well as the FLPMA. The Ely Field Office is now preparing the Ely Resource Management Plan, which will consolidate and update management direction for all BLM-managed lands in the Ely District and replace three separate planning documents (the Egan Resource Management Plan and the Schell and Caliente Management Framework Plans) that have guided management of public lands in the Ely District for over 15 years. WPEA's proposed Station is being considered under, and conforms to, the existing Egan Resource Management Plan.



Project Area
White Pine Energy Station Project
ELKO COUNTY
WHITE PINE COUNTY
Goshute Lake
Lages Substation
Nevada Northern Railroad
Greens Siding
Duck Creek
CHERRY CREEK RANGE
Goshute Basin
BUTTE MOUNTAINS
Johnson Spring Basin
Cherry Creek
SCHELL CREEK RANGE
ANTELOPE MOUNTAINS
Egan Basin
BUTTE VALLEY
Ray Siding
Stonehouse
Ninemile Basin
Minerals Materials Sale Area
Proposed Power Plant Site
Proposed Duck Creek Substation
STEPTOE VALLEY
SPRING VALLEY
Warm Springs Siding
Hunter Flat
EGAN RANGE
Moriah Ranches Seeding Project
Steptoe Siding
Alternative Duck Creek Substation
Alternative Power Plant Site
Glenn Siding
Bassett Lake
Proposed Thirtymile Substation
McGill Tailings Reclamation Area
McGill
McGill Junction
Existing 230kV & 345kV Transmission Lines
Copper Flat
Jakes Valley
Gonder Substation
Existing 230kV Transmission Lines
DUCK CREEK RANGE
Yelland Field
Baltimore Mill
Keystone
Keystone Junction
Riepetown
Ruth
Kimberly
Mineral City
Calumet
Copper Flat
Lane City
Ely
East Ely
Mosier
Existing Electrical Features
Existing Substation
Existing Transmission Line
Existing Distribution Line
Surface Water
Perennial Stream or River
Wetland
Connected Action
SWIP Transmission Line
NNR Upgrade
Common Project Features
Minerals Materials Sale Area
Moriah Ranches Seeding Project
Proposed Action Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Alternative 1 Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Project Area
NEVADA
N
0 1.5 3 Miles
1:300,000 when printed at 11 x 17 inches

Figure 1-1

The BLM must review WPEA's development plans to ensure that adequate provisions are included to: (1) prevent unnecessary degradation of public lands and their resources; (2) ensure reclamation of disturbed areas; and (3) ensure compliance with applicable state and federal laws. Approved BLM land use plans in adjacent or nearby administrative units are the Schell and Caliente Management Framework Plans, and the Elko and Egan Resource Management Plans. The Schell and Caliente Management Framework Plans and the Egan Resource Management Plan will subsequently be replaced by the Ely Resource Management Plan (BLM, 2005a).

1.4.2 Relationships to Non-BLM Policies, Plans, and Programs

The Proposed Action and the other action alternative (Alternative 1) being evaluated in this document are consistent with approved resource-related policies and programs of other federal agencies, Indian Tribes, local governments, and the State of Nevada.

1.5 Applicable Laws and Regulations and Authorizing Actions and Permits

1.5.1 Applicable Laws and Regulations

Table 1-1 lists laws, regulations, and executive orders potentially applicable to the Proposed Action and Alternative 1.

1.5.2 Permits and Approvals

Table 1-2 lists federal, state, county, and other permits and approvals that may be needed to implement the Proposed Action or Alternative 1.

1.6 Summary of Public Scoping and Issue Identification

Public scoping for the White Pine Energy Station DEIS occurred in Ely, Nevada on August 23, 2004, and Reno Nevada on August 24, 2004. Forty-two individuals attended the Ely meeting and 11 individuals attended the Reno meeting. WPEA and BLM representatives presented project information and discussed concerns with individuals in an open-house format at both meetings.

Individuals, public agencies, and non-profit organizations submitted 35 letters containing written comments to the BLM after the meetings. The majority of the comments expressed concern about potential impacts of the power plant to air quality and water development in the area. Numbers of comments (from highest to lowest) provided in each resource category by the public follow, and were used to identify issues addressed in this DEIS:

- Air quality: 44 comments
- Water development, use, and ground water impacts: 41 comments
- Wildlife, habitat, and ecological concerns: 33 comments
- Transmission: 15 comments
- Socioeconomics: 13 comments
- Visual resources: 13 comments
- Transportation, roads, and railroad: 12 comments
- Power need and recipients: 10 comments
- Proposed site and alternatives: 10 comments

- Waste and hazardous materials: 9 comments
- Energy efficiency, conservation, and alternative energy: 7 comments
- Power plant technology: 6 comments
- Noise: 6 comments
- Recreation: 2 comments
- Other: 10 comments

Public scoping and issue identification are discussed further in *Chapter 5, Consultation and Coordination.*

1.7 Projects Considered for Cumulative Analysis

Council on Environmental Quality guidelines for the preparation of EISs require that cumulative impacts be addressed in addition to direct and indirect impacts. Cumulative impacts are those incremental impacts that would result from the effects of the Proposed Action or Alternative 1 when added to the effects of other past, present, and reasonably foreseeable projects. The BLM recognizes the need for a thorough analysis of potential cumulative effects, not only from power plant siting activities, but from other development activities as well.

This section identifies 11 large projects whose cumulative impacts may extend across a broad range of the resource categories being assessed in this document (see Figure 1-2). Each project has been evaluated to determine if it is sufficiently defined (reasonably foreseeable) to be: (1) relevant to potential impacts; (2) within the project area of influence; and (3) of a magnitude that could potentially result in a cumulative impact. Descriptions and cumulative effects, if any, of the projects listed below are presented in Section 4.19, *Cumulative Impacts,* of Chapter 4, *Environmental Consequences*, together with any other projects not listed here whose effects would be very resource-specific. The 11 large projects considered in the cumulative impacts analysis are the following:

- Southwest Intertie Project (also a connected action as described in Section 2.2.3.7, *Connected Actions*)
- Nevada Northern Railway Upgrade (also a connected action)
- Nevada Northern Railway Operation (also a connected action)
- White Pine County Airport (Yelland Field) Expansion
- Basset Lake Expansion
- Egan Range Wind Generating Project
- Intermountain Power Project Phase III
- Newmont Gold Coal-fired Power Plant
- Clark, Lincoln, and White Pine Counties Groundwater Development Project (Southern Nevada Water Authority Project)
- Toquop Coal-fired Power Plant
- Ely Energy Center

TABLE 1-1

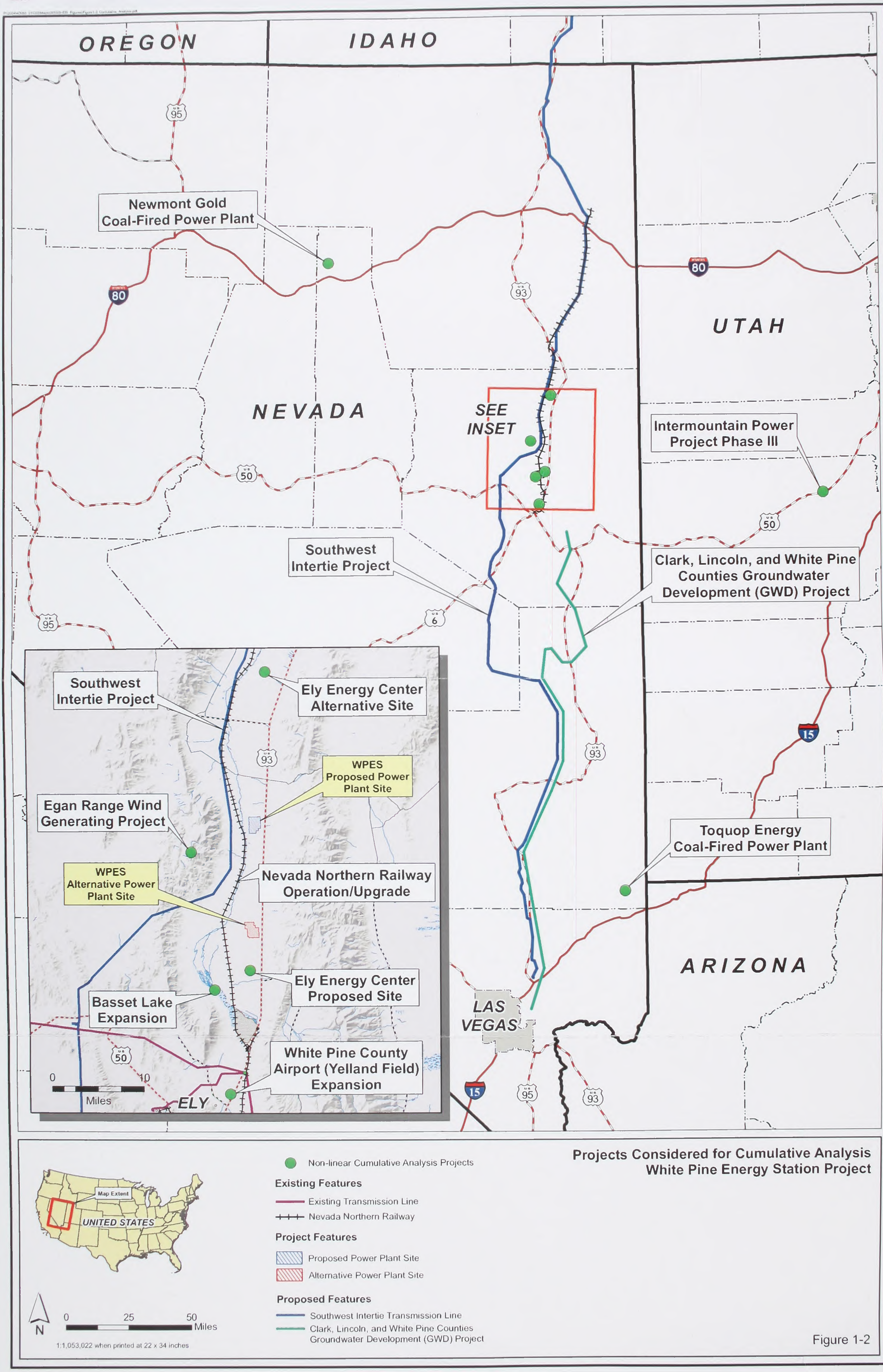
Laws, Regulations, and Executive Orders That May Apply to the Proposed Action and Alternative 1 of the White Pine Energy Station

National Environmental Policy Act (NEPA) 42 USC 4321 et seq.
Council on Environmental Quality general regulations implementing NEPA (40 CFR Parts 1500-1508)
Department of the Interior's implementing procedures and proposed revisions (August 28, 2000, Federal Register)
National Historic Preservation Act and regulations implementing NHPA 16 USC 470 et seq.
Antiquities Act of 1906 16 USC 431 et seq.
Archaeological Resources Protection Act, as amended 16 USC 470aa et seq.
Native American Graves Protection and Repatriation Act of 1990
Clean Air Act 42 USC 7401 et seq.
Clean Water Act 33 USC 1251 et seq.
Disposition: Sales—43 CFR 2700
Endangered Species Act (ESA) 16 USC 1531 et seq.
Nevada Division of Forestry Critically Endangered Flora Law (NRS 5.27-5.33)
Noise Control Act of 1972, as amended 42 USC 4901 et seq.
Occupational Safety and Health Act 29 USC 651 et seq. (1970)
Mineral Leasing Act
Pollution Prevention Act of 1990 42 USC 13101 et seq.
Safe Drinking Water Act 42 USC s/s 300f et seq. (1974)
Migratory Bird Treaty Act (Migratory Bird Guidance) 16 USC 703–711 Executive Order January 1, 2001
NEPA, Protection and Enhancement of Environmental Quality Executive Order 11512
National Historic Preservation Executive Order 11593
Floodplain Management Executive Order 11988
Protection of Wetlands Executive Order 11990
Federal Compliance with Pollution Control Standards Executive Order 12088
Environmental Justice Executive Order 12898
Indian Sacred Sites Executive Order 13007
American Indian Religious Freedom Act of 1978 (42 USC 1996)
Memorandum on Government-to-Government Relations with Native American Tribal Governments of 1994
Indian Self-Determination and Educational Assistance Act of 1975, Title I
Indian Self-Determination and Educational Assistance Act of 1994, Title IV
Departmental Responsibilities for Indian Trust Resources, 512 DM 2.1
Sacred Sites, 512 DM 3
Consultation and Coordination with Indian Tribal Governments Executive Order 13175
Invasive Species Executive Order 13112
Responsibilities, and the Endangered Species Act, Secretarial Order 3206 (June 5, 1997)
Federal Land Policy and Management Act of 1976 (FLPMA) 43 USC 1701 et seq.
BLM right-of-way regulations 43 CFR 2800

TABLE 1-2

Federal, State, and County Permits and Approvals That May be Needed to Implement the Proposed Action or Alternative 1 of the White Pine Energy Station

Federal Permits and Approvals
Bureau of Land Management NEPA Record of Decision for Proposed Action
Bureau of Land Management Rights-of-Way for electric power generating plant, electric transmission lines and substations, wellfield and water pipeline, electric distribution line, access roads, railroad spur, and other ancillary approvals
U.S. Fish and Wildlife Service, Endangered Species Act Section 7 Consultation and Biological Opinion
Acid Rain (Title IV CAA) Permit
U.S. Environmental Protection Agency, Region IX, Title V (CAA) Operating Permit
U.S. Environmental Protection Agency, Section 402 National Pollutant Discharge Elimination System Notification for Stormwater Management during Construction
U.S. Environmental Protection Agency, Section 402 National Pollutant Discharge Elimination System Notification for Stormwater Management during Operation
U.S. Army Corps of Engineers, Section 404 Excavation or Discharge of Fill Material into Waters of the U.S., Including Wetlands
State of Nevada Permits and Approvals
Nevada State Historic Preservation Office (SHPO), Section 106 review and concurrence, per National Historic Preservation Act for BLM lands, per protocol between BLM and Nevada SHPO
Nevada Department of Wildlife Project Review: Wildlife and Habitat Consultation for Disturbance on BLM land
Temporary Discharge Permit—Nevada Division of Environmental Protection, Bureau of Water Pollution Control
Nevada Public Utilities Commission Utility Environmental Protection Act Permit
Nevada Division of Environmental Protection, Section 401 Water Quality Certification
Water Right Permit-State Engineer—Nevada Department of Water Resources
Prevention of Significant Deterioration Program Major Source Permit—Nevada Department of Environmental Quality
Dust Control Permit—Nevada Department of Environmental Quality
Ground Water Discharge Permit—Nevada Division of Environmental Protection, Bureau of Water Pollution Control
Industrial Artificial Pond Permit—Nevada Department of Wildlife
Nevada Department of Transportation Encroachment Permit
White Pine County Permits and Approvals
White Pine County Master Plan Amendment, Zone Change, and Special Use Permit
Grading permits



Projects Considered for Cumulative Analysis
White Pine Energy Station Project

Figure 1-2

2.1 Introduction

This chapter describes the Proposed Action, one other action alternative (Alternative 1), and the No Action Alternative for the Station. Each action is analyzed in detail in Chapter 4, *Environmental Consequences,* of this document and includes the following:

- **Proposed Action and Alternative 1.** Power Plant Right-of-Way (ROW) and Sale, Electric Transmission Facilities ROW, Water Supply System ROW, Rail Spur ROW, Access ROW, Additional Construction ROW (Electric Distribution Line and Mineral Materials Sale), and Enhancement Measures (Moriah Ranches Seeding Project). In addition, Appendix A describes Best Management Practices (BMPs) that would be implemented as an integral part of the Proposed Action and Alternative 1.
- **No Action Alternative.** The No Action Alternative represents the status quo (not approving or implementing the Proposed Action or Alternative 1). Analysis of the No Action Alternative is required by National Environmental Policy Act (NEPA) guidelines. It is assumed that the Nevada Northern Railway (NNR) Project and the Southwest Intertie Project (SWIP) connected actions would be implemented.

This chapter also describes alternatives that were considered during scoping of this EIS, but eliminated from detailed analysis.

The Proposed Action and Alternative 1 were developed for initial presentation at public scoping meetings in Ely, Nevada, on August 23, 2004, and Reno, Nevada, on August 24, 2004. Comments received during those meetings and during the public scoping comment period (August 6, 2004, to September 7, 2004) for the Station were considered in formulating the Proposed Action and Alternative 1 presented in this document. In addition, meetings were held with local and regional staff of the Bureau of Land Management (BLM) and technical staff of the project proponent (WPEA) to aid in further formulating the Proposed Action and Alternative 1.

As required for the issuance of ROWs by the BLM, a Plan of Development would be finalized for the alternative selected for implementation. Prior to construction, a Construction, Operation, and Maintenance Plan would be prepared that details the methods and procedures to be used in the construction of the Station features. The Construction, Operation, and Maintenance Plan will incorporate site-specific stipulations, terms, and conditions in order to satisfy all Station-related construction requirements, as well as operational, maintenance, and restoration requirements associated with lands administered by the Ely Field Office of the BLM where Station features would be located.

2.2 Proposed Action

2.2.1 Description of BLM Actions

2.2.1.1 Issuance of ROWs

BLM actions that would occur under the Proposed Action include issuing ROWs necessary for construction and operation of the Station. Subsequent to the issuance of ROWs, arrangements would be made for the sale of the power plant ROW to WPEA (see Section 2.2.1.4, *Sale of Power*

Plant ROW). ROWs would be issued for the following activities:

- Construction and operation of the power plant including the power island; coal unloading, handling, and storage facilities; a solid waste disposal facility; an evaporation pond; an electric switchyard; and temporary construction worker housing (Power Plant ROW)
- Construction and operation of the water supply system to provide water for the power plant including ground water wells, underground water pipelines, electric distribution lines, communication lines, and access roads (Water Supply System ROW)
- Construction and operation of a rail spur from the existing Nevada Northern Railway (NNR) to the power plant for the supply of coal (Rail Spur ROW)
- Construction and operation of electric transmission facilities to interconnect the power plant with existing and planned transmission facilities including substations and transmission lines (Electric Transmission Facilities ROW)
- Construction and operation of road access and certain utility access to the power plant and other Station features (Access ROW)
- Construction and operation of certain components necessary during construction including a temporary electric distribution line for the supply of power
- Permanent ROWs would be necessary for the operation and maintenance of all Station facilities located on BLM-managed public land. In addition, temporary ROWs would be required from the BLM to accommodate construction activities such as drilling, trenching, paving, and material/ equipment staging

All ROWs would be issued to WPEA; however, after issuance WPEA may request to assign interest to certain ROWs to other parties. Examples could include assigning ROW interest to a local communication company for communication lines to the Station, and assigning certain electrical facilities to local electric providers.

2.2.1.2 Mineral Materials Sale

An offsite borrow area would be constructed and operated to supply earth and rock materials for project construction.

2.2.1.3 Moriah Ranches Seeding Project

A seeding project would be implemented to enhance grazing and wildlife value on 700 to 900 acres of public land in the Ely BLM District.

2.2.1.4 Sale of Power Plant ROW

Under BLM regulations and guidance, federal land identified for disposal in the applicable BLM Resource Management Plan may be sold by competitive bid, modified competitive bid, or direct sale (for example, sold directly to a specified party without bidding). In all cases, the BLM must obtain not less than fair market value for land it sells.

WPEA has requested the BLM dispose of the Power Plant ROW to WPEA by direct sale. In a submittal to BLM, WPEA (2004) described why land disposal of the Power Plant ROW by direct sale to WPEA would be consistent with BLM regulations and in the public interest.

WPEA's proposed Station would be located within the Egan Resource Management Plan area. The Egan Resource Management Plan identifies several thousand acres of public land for disposal in Steptoe Valley north of Ely, including land in the area of the proposed power plant. Land disposal of the Power Plant ROW is consistent with the Egan Resource Management Plan.

WPEA intends to operate an onsite non-hazardous, industrial solid waste disposal facility. BLM policy discourages such facilities on BLM-administered land and therefore would dispose of the Power Plant ROW by direct sale.

If a Record of Decision is issued approving the Station, the BLM would first grant the Power Plant ROW to WPEA to accommodate the Station's financing and construction schedule. The BLM would subsequently dispose of the Power Plant ROW by sale, which would include the land where the solid waste disposal facility would be located.

2.2.2 Description of Station Area

Figure 2-1 depicts the Power Plant ROW and locations of prominent Station features associated with the Proposed Action. The Power Plant ROW would be located entirely in White Pine County, Nevada, approximately 26 miles south of the White Pine County/Elko County line and approximately 40 miles west of the Nevada/Utah border. Prominent landmarks in the area of the Power Plant ROW include U.S. Highway 93 (U.S. 93) and the Schell Creek Range (in the Humboldt National Forest) to the east; Duck Creek and the Egan Range to the west; and Goshute Lake to the north. The communities of McGill and Ely are approximately 22 miles and 34 miles south of the Power Plant ROW, respectively, and Great Basin National Park is approximately 57 miles to the southeast.

The Station would primarily be located in the Steptoe Valley Hydrographic Basin. The electric transmission facilities would extend beyond the Steptoe Valley Hydrographic Basin into the Butte Valley and Jakes Valley Hydrographic Basins. Duck Creek is the primary drainage in Steptoe Valley near the Power Plant ROW. The creek receives runoff from the western flank of the Schell Creek Range and the eastern flank of the Egan Range and flows north toward Goshute Lake.

2.2.3 Description of Project Features and Rights-of-Way

Project features and ROWs associated with the Proposed Action for the Station are described in the following text. ROWs that would be needed for the Station include the Power Plant ROW, Electric Transmission Facilities ROW, Water Supply System ROW, Rail Spur ROW, Access ROW, and Additional Construction ROW.

Table 2-1 summarizes the estimated acres that would be needed for each ROW and whether the ROWs would be temporary (construction only) or permanent (construction plus the life of the Station). Table 2-1 also summarizes the estimated acres of construction-related and permanent (during operations) land disturbances that would result from the construction and operation of the Station as well as acres of lands that would be reclaimed.

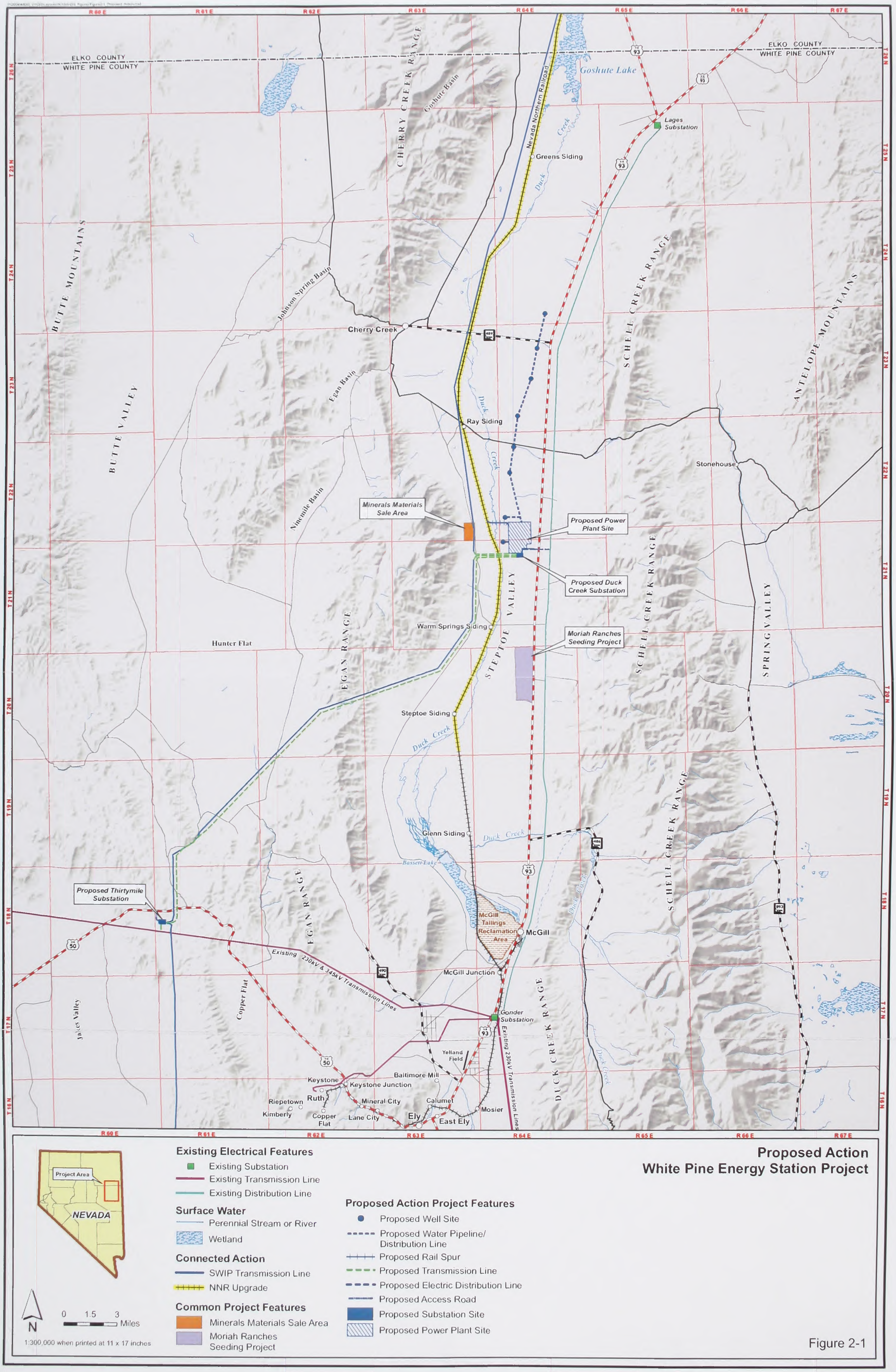
The Proposed Action would require approximately 2,510 acres of ROWs, including 2,409 acres of permanent ROWs and 101 acres of temporary, construction ROWs (Table 2-1). Subsequent to the issuance of ROWs, arrangements would be made for the sale of the 1,281-acre Power Plant ROW to WPEA. Sale of the Power Plant ROW would reduce the amount of permanent ROWs needed to 1,128 acres. Table 2-1 also shows estimated acres of temporary and permanent disturbed areas and acres reclaimed for the Proposed Action.

TABLE 2-1

Estimated Acres of ROWs and Disturbed and Reclaimed Areas for the Proposed Action

	ROWs		Disturbed and Reclaimed Areas		
	Temporary (acres)[a]	Permanent (acres)[b]	Construction[a] (acres)	Reclaimed (acres)	Permanent[c] (acres)
Power Plant ROW/Power Plant Site	0	1,281	1,281	0	1,281
Electric Transmission Facilities ROW					
Duck Creek Substation ROW	0	60	60	0	60
Thirtymile Substation ROW	0	77	77	0	77
Duck Creek to Thirtymile 500-kV Line ROW	0	774	249	199	50
Falcon-Gonder 345-kV Interconnection ROW	0	9	8	7	1
SWIP 500 kV Interconnection ROW	0	122	40	34	6
Water Supply System ROW					
Linear Facilities ROW (30-foot-wide temporary)	48	0	48	48	0
Linear Facilities ROW (40-foot-wide permanent)	0	64	64	48	16
Ground Water Well ROW (8 wells)	0	4	4	3	1
Construction Staging Area ROW	2	0	2	2	0
Rail Spur ROW					
Temporary ROW (30-foot-wide)	5	0	5	5	0
Permanent ROW (35- to 70-foot-wide)	0	9	9	0	9
Access ROW					
Power Plant ROW Access	0	6	6	0	6
Duck Creek Substation ROW Access	0	1	1	0	1
Thirtymile Substation ROW Access	0	2	2	0	2
Additional Construction ROW					
Electric Distribution Line	6	0	6	6	0
Mineral Materials Sale area (Offsite Borrow Area)	40	0	40	40	0
Total	**101**	**2,409**	**1,902**	**392**	**1,510**

[a] Construction
[b] Construction plus life of Station
[c] Operations



Proposed Action
White Pine Energy Station Project
Existing Electrical Features
Existing Substation
Existing Transmission Line
Existing Distribution Line
Surface Water
Perennial Stream or River
Wetland
Connected Action
SWIP Transmission Line
NNR Upgrade
Common Project Features
Minerals Materials Sale Area
Moriah Ranches Seeding Project
Proposed Action Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Project Area
NEVADA
N
0 1.5 3 Miles
1:300,000 when printed at 11 x 17 inches
ELKO COUNTY
WHITE PINE COUNTY
Goshute Lake
Lages Substation
Greens Siding
Nevada Northern Railroad
Duck Creek
CHERRY CREEK RANGE
Goshute Basin
SCHELL CREEK RANGE
ANTELOPE MOUNTAINS
BUTTE MOUNTAINS
Johnson Spring Basin
Cherry Creek
Egan Basin
BUTTE VALLEY
Ray Siding
Stonehouse
Ninemile Basin
Minerals Materials Sale Area
Proposed Power Plant Site
Proposed Duck Creek Substation
STEPTOE VALLEY
Warm Springs Siding
Hunter Flat
Moriah Ranches Seeding Project
EGAN RANGE
SPRING VALLEY
Steptoe Siding
Glenn Siding
Bassett Lake
Proposed Thirtymile Substation
McGill Tailings Reclamation Area
McGill
McGill Junction
Existing 230kV & 345kV Transmission Lines
Existing 230kV Transmission Lines
Copper Flat
Jakes Valley
Gonder Substation
DUCK CREEK RANGE
Yelland Field
Baltimore Mill
Keystone
Keystone Junction
Riepetown
Ruth
Kimberly
Mineral City
Calumet
Copper Flat
Lane City
Ely
East Ely
Mosier

Figure 2-1

2.2.3.1 Power Plant ROW

The equipment and operations to be located on the Power Plant ROW would include the power island; coal unloading, handling, and storage facilities; a solid waste disposal facility for coal combustion byproducts; evaporation ponds; and construction worker housing. Figure 2-2 shows the preliminary site plan for the Proposed Action Power Plant ROW. Figure 2-3 presents a conceptual rendering of the Station. Approximately 1,281 acres would be required for the Power Plant ROW (Table 2-1). The Power Plant ROW would be located within Sections 31 and 32, Township 22 North, Range 64 East and Sections 5 and 6, Township 21 North, Range 64 East of White Pine County.

2.2.3.1.1 Power Island

The power island area would include the equipment and associated support facilities necessary to produce electricity. Major power island components are described below and depicted in Figure 2-4 in a schematic of the proposed electric power production process. The figure shows the power production process in which water is heated in coal-fired boilers to produce steam and drive turbines and generate electricity. The rate of water use is described in Section 2.2.3.3, *Water Supply System ROW*. The major power island components are as follows:

- **Pulverized Coal-Fired Boiler(s).** Up to three supercritical, pulverized coal-fired boilers would be constructed at the power plant to produce steam for the steam turbine-generator(s). The boilers would be designed to maximize efficiency and minimize air pollution during the combustion process. The boilers would be fueled primarily by low-sulfur western coal and use ultra-low sulfur distillate oil as fuel for startup and flame stabilization. Each boiler could be up to 300 feet tall.
- **Steam Turbine-Generator(s).** Each pulverized coal-fired boiler would have a dedicated steam-turbine generator. The steam turbine-generators would use steam produced by the boilers to drive electric generators. Each steam turbine-generator is expected to have a nominal generating capacity of 500 megawatts (MW) to 800 MW. The maximum net generating capacity of the combined steam turbine generators is expected to be no more than approximately 1,590 MW. The steam used in the steam turbine-generators would exhaust from the steam turbine-generator into a condenser.
- **Condenser(s).** A condenser would attach to each steam turbine to receive exhaust steam. Inside the condenser, the exhaust steam would condense to its liquid state for reuse in the boiler.
- **Cooling Towers.** Up to three cooling towers would be constructed at the power plant site to reject heat from each steam condenser. It is anticipated that natural draft cooling towers would be used. Each cooling tower would be approximately 550 feet tall with diameters of approximately 590 feet at the base, 330 feet at the throat, and 350 feet at the top of the structure. At higher ambient air temperatures, water spray augmentation would be utilized to increase the cooling efficiency.
- **Air Pollution Control Equipment.** The emissions control equipment for each pulverized coal-fired boiler would consist of low nitrogen oxide burners, overfire air, selective catalytic reduction, spray dryer absorber (dry

scrubber), fabric filter baghouse, and halogenated activated carbon injection. Exhaust gases from the boilers would flow through the emissions control equipment, as applicable, before being discharged to the atmosphere via the pulverized coal-fired boiler stack(s). The emissions control equipment is effective in reducing nitrogen oxide, sulfur dioxide, particulate matter, and hazardous air pollutants, including mercury. The systems would be designed to meet or exceed the requirements of the power plant's air permit.

- **Pulverized Coal-Fired Boiler Stack(s).** The power plant would include up to two pulverized coal-fired boiler stacks, one for two pulverized coal-fired boilers and a second for the third pulverized coal-fired boiler. Each stack is expected to be approximately 600 feet tall.

- **Plant Electric Switchyard**. An electric switchyard would be located on the power plant site to increase the voltage of the electricity produced to 500 kilovolts (kV). The switchyard may include circuit breakers, disconnect switches, generator step-up transformers, auxiliary power transformers, steel structures, and a control building. One or more 500-kV transmission lines would be built from the plant electric switchyard across the power plant site to the Duck Creek Substation. Lower voltage electric distribution lines would extend from the switchyard to provide power to water wells that would supply water to the power plant.

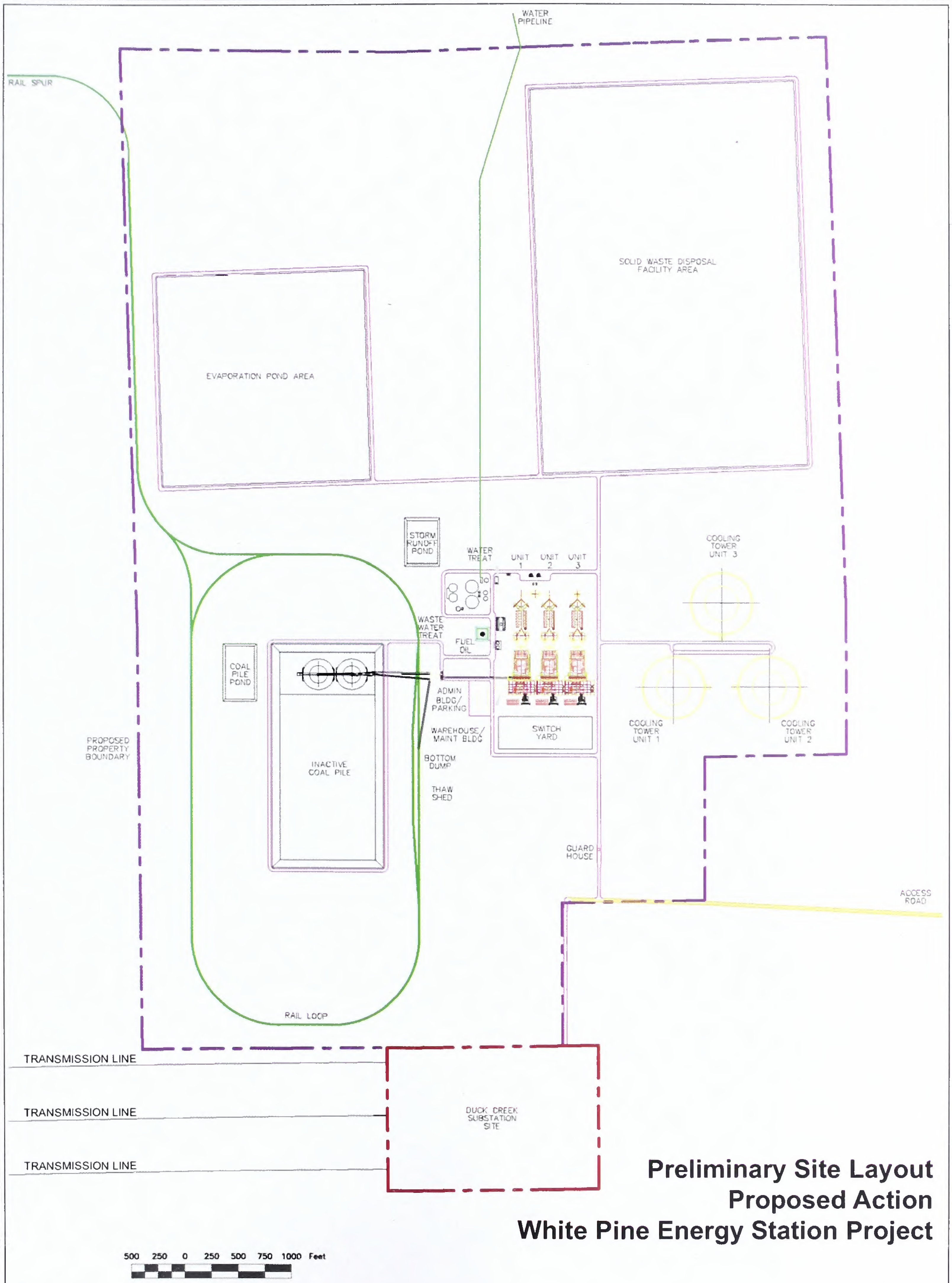
- **Water Treatment**. The power island would include water treatment facilities for raw water, feed water to the plant, condensate, and circulating cooling water in order to maintain water quality for the process equipment. The water treatment facilities would include a water treatment building, water storage tanks, chemical storage tanks and areas, clarifiers, and demineralizers.

- **Auxiliary Boiler**. The power island would include an auxiliary boiler to be used during startup of the pulverized coal-fired boilers and during periods when a pulverized coal-fired boiler is offline. The auxiliary boiler would be fueled primarily by ultra-low sulfur distillate oil. The stack for the auxiliary boiler is anticipated to be 225 feet tall.

- **Additional Facilities**. The power island area may also include various buildings to house equipment and conduct administration, operations, and maintenance activities; warehouses; electrical switchgear buildings; various pumps, motors, and fans; fuel and chemical storage tanks/areas; lime/limestone, ammonia, and mercury sorbent storage and handling equipment; fire protection, security, and safety systems; stormwater facilities; continuous emission monitoring systems; auxiliary boilers; and back-up electric generators.

2.2.3.1.2 Coal Unloading, Storage, and Handling

Low-sulfur western coal from the Powder River Basin in Wyoming would be the primary fuel for the Station and would be delivered to the power plant site via trains. The estimated life of Powder River Basin coal reserves is approximately 300 to 500 years. The power plant would use approximately 22,500 tons of coal per day when the Station is at full load operation.

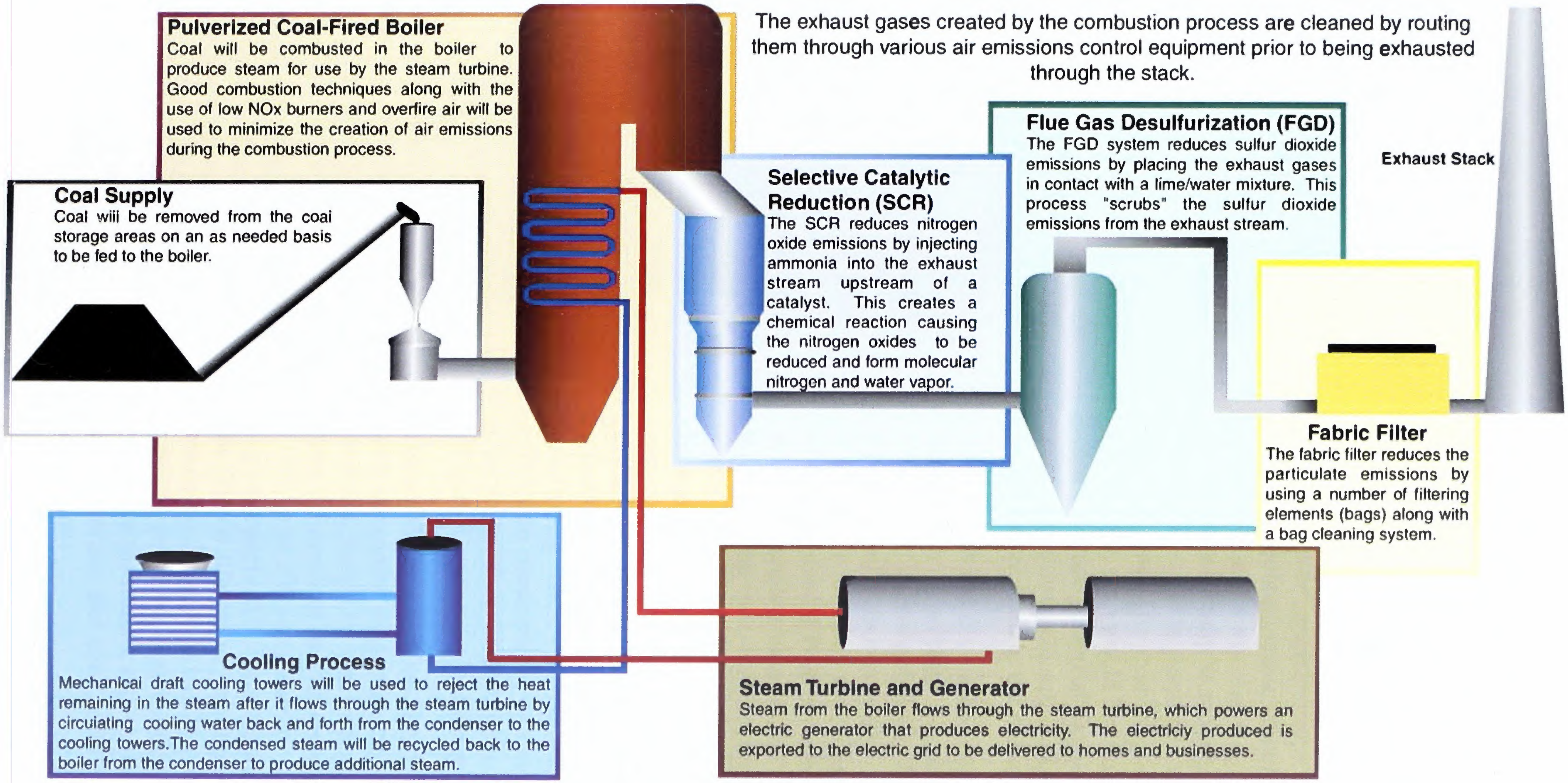


Preliminary Site Layout
Proposed Action
White Pine Energy Station Project

Figure 2-2

Conceptual Rendering of Proposed Power Plant White Pine Energy Station

Figure 2.3



Schematic of the Production Process
White Pine Energy Station

Figure 2-4

The following onsite facilities would be designed to accommodate the unloading, storage, and handling of coal.

- **Rail Loop.** A rail loop would be built onsite to accommodate coal train deliveries. The rail loop would be designed so that no public roads would be blocked while the train is being unloaded. The rail loop is expected to require approximately 11,000 linear feet of track.
- **Coal Unloading Station**. Each rail car would pass through a partially enclosed building for unloading. The unloading station would be designed with dust suppression systems to minimize dust emissions.
- **Coal Storage**. Coal would be stored outdoors in designated active and inactive coal storage areas. The coal storage piles would consist of approximately 45 acres of property onsite. The coal piles within the coal storage areas would be maintained using mobile equipment described under coal handling. Water sprays would be used for dust suppression.
- **Coal Handling.** Coal would be transported from various points on the power plant site by use of conveyor systems. The conveyors would be designed to minimize dust emissions. At the coal storage areas, equipment such as stackers, reclaimers, bull dozers, and front-end loaders may be used to manage the coal piles.
- **Coal Preparation Equipment.** Before consumption in the power plant, coal would pass through preparation equipment such as crushers and pulverizers. These processes would take place in enclosed areas to minimize the release of dust.

2.2.3.1.3 Solid Waste Disposal

An onsite solid waste disposal facility would be constructed and operated for the disposal of coal combustion byproducts including fly ash, bottom ash, economizer ash, scrubber byproducts and coal rejects, and other inert, nonhazardous industrial wastes generated onsite including construction and maintenance debris. Certain wastes may be remarketed for beneficial reuse as practical. All other types of waste (for example, office wastes, oil, liquids, etc.) would be hauled to an offsite licensed disposal facility. Wastes generated during construction activities would be recycled to the extent practical.

The solid waste disposal facility would be designed in accordance with all applicable federal and state regulations. The facility would include environmental protection measures required by the Nevada Division of Environmental Protection to prevent the release of contaminants to the environment, including surface and ground water. These measures include a bottom liner and leachate collection and control system, a surface water runoff management system with a sediment retention basin, and environmental monitoring. These environmental protection measures are outlined in the Operations Plan, Closure Plan, and Post-Closure Plan (SRK Consulting, 2006b).

The solid waste disposal facility, together with associated stormwater control facilities, would be constructed in stages to meet the needs of the Station and may cover up to 200 acres and be approximately 100 feet tall by the end of the Station life. Waste handling systems would be designed to handle the various types of waste and may include storage/preparation areas, conveyors, silos, piping, trucks, and other mobile equipment.

2.2.3.1.4 Evaporation Pond

An evaporation pond with a surface area of up to 75 acres would be constructed on the power plant site. Berms and setbacks around the evaporation pond could cover approximately 15 additional acres for a total of up to 90 acres needed for the evaporation pond.

Wastewater from the power plant site and stormwater runoff that has been collected after coming into contact with potential pollution sources would be discharged to the evaporation pond in accordance with applicable federal and state regulations. The evaporation pond would include environmental protection measures required by the Nevada Division of Environmental Protection, including an appropriate pond lining and leak detection system, additional liner protection at the discharge point for the inlet piping, specially engineered berms to ensure stability during operation, and environmental monitoring. These environmental protection measures are outlined in SRK Consulting (2006a). In addition, protective measures would be implemented and the pond would be monitored to minimize the potential for water quality or other pond-related impacts to wildlife (see Appendix A, *Best Management Practices,* Biological Resources, Item No. 4*).*

2.2.3.1.5 Construction Worker Housing

Construction worker housing would include both onsite and offsite housing. The power plant site would include an onsite construction worker housing area with the facilities necessary to support the living accommodations of up to 1,000 workers during construction of the Station. The remaining 200 workers of the peak construction workforce of approximately 1,200 workers would reside in offsite housing.

The onsite construction worker housing facilities would be located within the power plant site. Onsite community facilities would include housing, kitchen/dining facilities, water and fire protection facilities, sanitary facilities, medical facilities, security and administrative facilities, recreational facilities, and parking. Recreational facilities may include indoor facilities such as TV rooms, game rooms, and gym area and outdoor facilities such as basketball courts and ball fields. Medical facilities would be limited to first response and may include an ambulance station onsite and an area designated for helicopter landing.

Up to 20 modular, dormitory style community housing facilities would be used as the living quarters to accommodate as many as 800 workers onsite. Each dormitory would be prefabricated and erected on a concrete slab. Each dormitory would include private or communal wash/toilet areas and laundry and mudroom facilities. An onsite recreational vehicle (RV) park would be established in addition to the dormitory housing to accommodate approximately 200 additional workers for a total capacity of approximately 1,000 workers onsite.

The primary infrastructure to support the construction worker housing would be potable water systems, sanitary wastewater treatment, and electric power and communication lines. Potable water would be provided using the water supply system for the Station. Sanitary wastewater would be collected and treated with an onsite package wastewater treatment plant. Electric power would be established via a temporary distribution line (see Section 2.2.3.6.1) and through the use of diesel generators, as required. Parking areas would be provided throughout the construction area and surfaced with crushed aggregate or gravels. Refuse materials would be collected regularly and transported to an offsite, licensed landfill.

Upon completion of Station construction, modular housing and buildings would be removed from the power plant site and use of the RV park would be limited to periods of major maintenance on the Station. Selected facilities used to support the onsite housing may be converted to permanent use to support the permanent operations and maintenance of the Station. Depending on the size of the power plant initially built, future expansion of the plant would require the re-establishment of the construction worker housing on the power plant site (see discussion in Section 2.2.4.2, *Construction Schedule and Workforce*, regarding construction scenarios and construction worker housing).

2.2.3.2 Electric Transmission Facilities ROW

The electric transmission facilities would consist of overhead 500-kV and 345-kV electric transmission lines and two electric substations (see Figure 2-1). The permanent ROW needed for the electric transmission facilities would total approximately 1,042 acres (see Table 2-1) and include the following:

- Approximately 60-acre electric Duck Creek Substation ROW
- Approximately 77-acre electric Thirtymile Substation ROW
- Approximately 32 mile-long, 200-foot-wide ROW (774 acres) for one 500-kV transmission line from the Duck Creek Substation to the Thirtymile Substation
- Two approximately 0.2 mile-long, 160-foot-wide ROWs (9 acres) for two 345-kV transmission lines to interconnect the Falcon-Gonder 345-kV transmission line to the Thirtymile Substation
- Two approximately 2.5 mile-long, 200-foot-wide ROWs (122 acres) for two 500-kV transmission lines to interconnect the planned SWIP 500-kV transmission line to the Duck Creek Substation

2.2.3.2.1 Duck Creek Substation ROW

The Duck Creek Substation would be located adjacent to and immediately south of the power plant site on approximately 60 acres of ROW (see Figures 2-1 and 2-2). The Duck Creek Substation would contain 500-kV electric equipment necessary to operate the substation, which may include circuit breakers, disconnect switches, coupling capacitor voltage transformers, surge arresters, current transformers, phase shifters, series compensators, communications equipment, steel structures, and a control building. Lower voltage equipment may also be included in the substation at a later date to meet the needs of the regional electric system. The substation would be fenced to restrict public access. Transmission towers and lines would also be placed within the Duck Creek Substation ROW.

2.2.3.2.2 Thirtymile Substation ROW

The Thirtymile Substation would be located on approximately 77 acres in Section 19, Township 18 North, Range 61 East (see Figure 2-1). The Thirtymile Substation would contain 500-kV and 345-kV equipment necessary to operate the substation, which may include transformers, circuit breakers, disconnect switches, coupling capacitor voltage transformers, surge arresters, current transformers, phase shifters, series compensators, communications equipment, steel structures, and a control building. The substation would be fenced to restrict public access. Transmission towers and lines would also be placed within the Thirtymile Substation ROW.

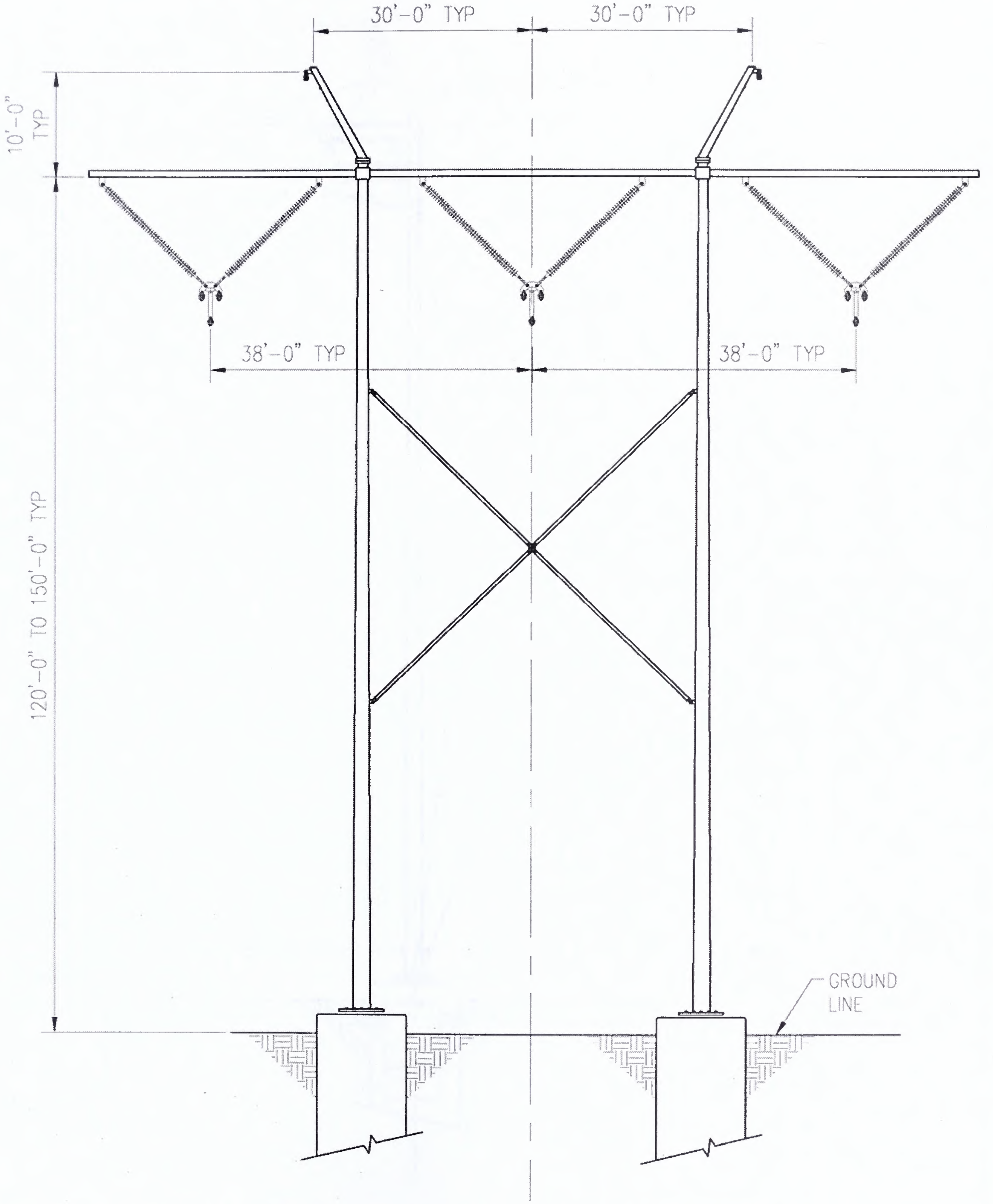
2.2.3.2.3 Duck Creek to Thirtymile 500-kV Transmission Line ROW

One new aboveground 500-kV transmission line originating at the Duck Creek Substation would be constructed in a 200-foot-wide ROW and extend 32 miles southwest to the proposed Thirtymile Substation near Robinson Summit (see Figure 2-1). The type of transmission tower utilized for the Duck Creek to Thirtymile 500-kV transmission line would vary among steel pole H-frame (3-pole dead end) and single and double circuit self-supporting steel lattice towers to accommodate various mitigation, engineering, and maintenance needs. In Steptoe and Butte Valleys, the towers used would be steel pole H-frames with avian predator perch deterrents. Across the Egan Range, the towers used would be single-circuit self-supporting lattices to provide structural integrity and minimize construction and maintenance costs in this uneven terrain. Through the narrow canyon along Bothwick Road at the south end of Butte Valley, the towers used would be double-circuit self-supporting lattices to accommodate a potential second circuit associated with the SWIP. After passing through this canyon, the towers used would be single-circuit self-supporting lattices until reaching the Thirtymile Substation. These self-supporting lattice structures would not need avian predator deterrents because they are not in an area that is suitable habitat for sage-grouse. It is estimated that there would be approximately 21 miles of transmission line utilizing H-frame towers, approximately 10 miles of transmission line utilizing single-circuit self-supporting lattice towers, and approximately 1 mile of transmission line utilizing double-circuit self-supporting lattice towers.

Figures 2-5 through 2-9 contain typical representations of planned transmission towers. As noted on the figures, avian predator perch deterrents/nest construction barriers would be utilized on all electrical transmission support structures in all habitats except pinyon-juniper (not sage-grouse habitat). Angle suspension towers, which look essentially the same as tangent towers, would be required at turning points in the line.

The height of and spacing between each tower would be determined based on detailed engineering and be dependent on the type of tower used and the terrain. Typically, steel pole H-frame towers would be 120 to 150 feet tall; single-circuit lattice towers would typically be 125 to 155 feet tall; and double-circuit lattice towers would typically be 170 to 200 feet tall.

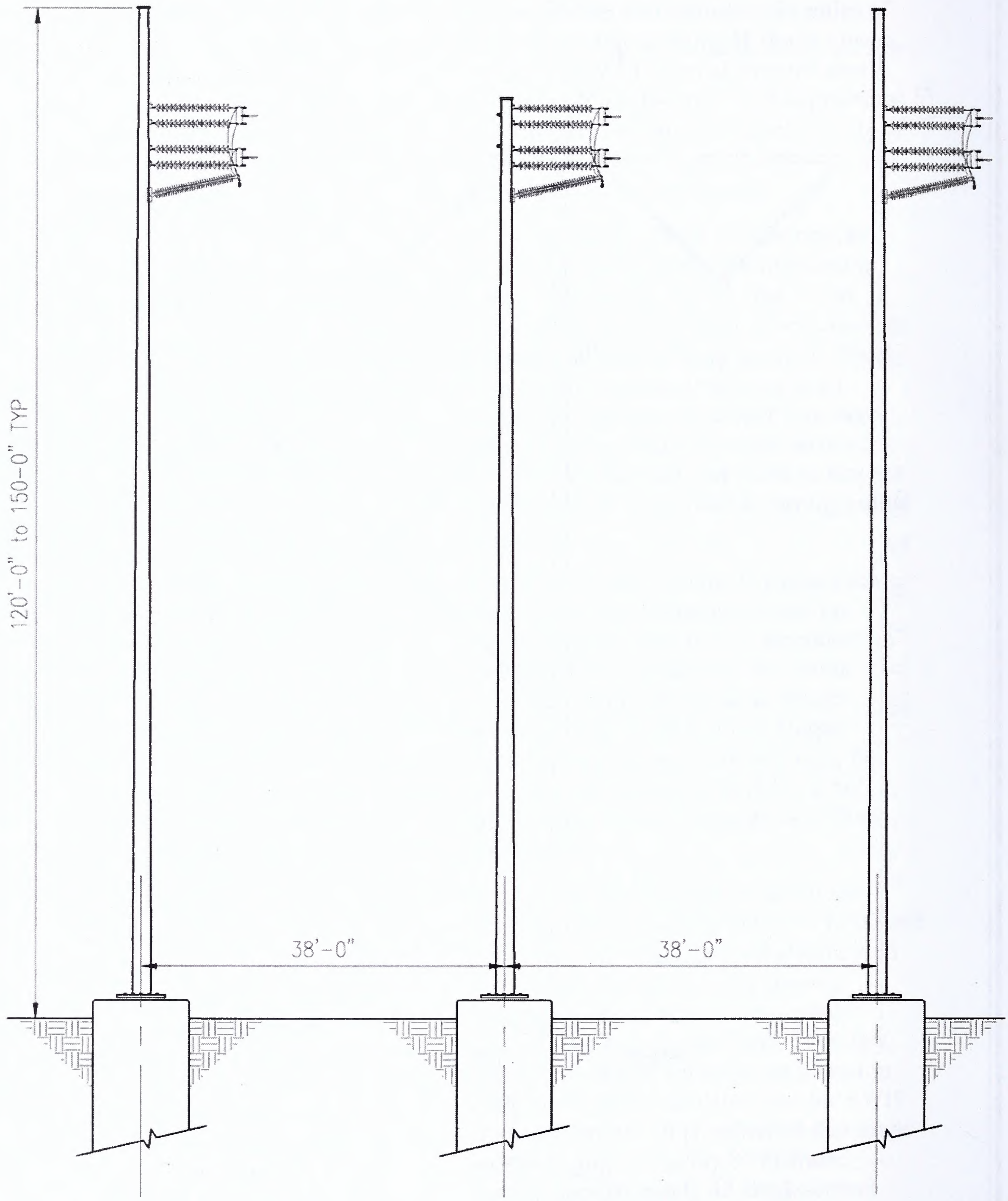
The spacing between tower structures would generally average between 1,300 and 1,600 feet, but could vary substantially in steep or uneven terrain. The spacing between double-circuit towers would generally be between 900 and 1,100 feet. The towers would generally be placed in tandem with tower locations for the SWIP transmission line. It is estimated that there would be approximately 86 H-frame towers, approximately 43 single-circuit self-supporting lattice towers, and approximately 6 double-circuit self-supporting lattice towers.



500-kV Transmission Line
Typical Tangent Steel Pole H-Frame
White Pine Energy Station Project

NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

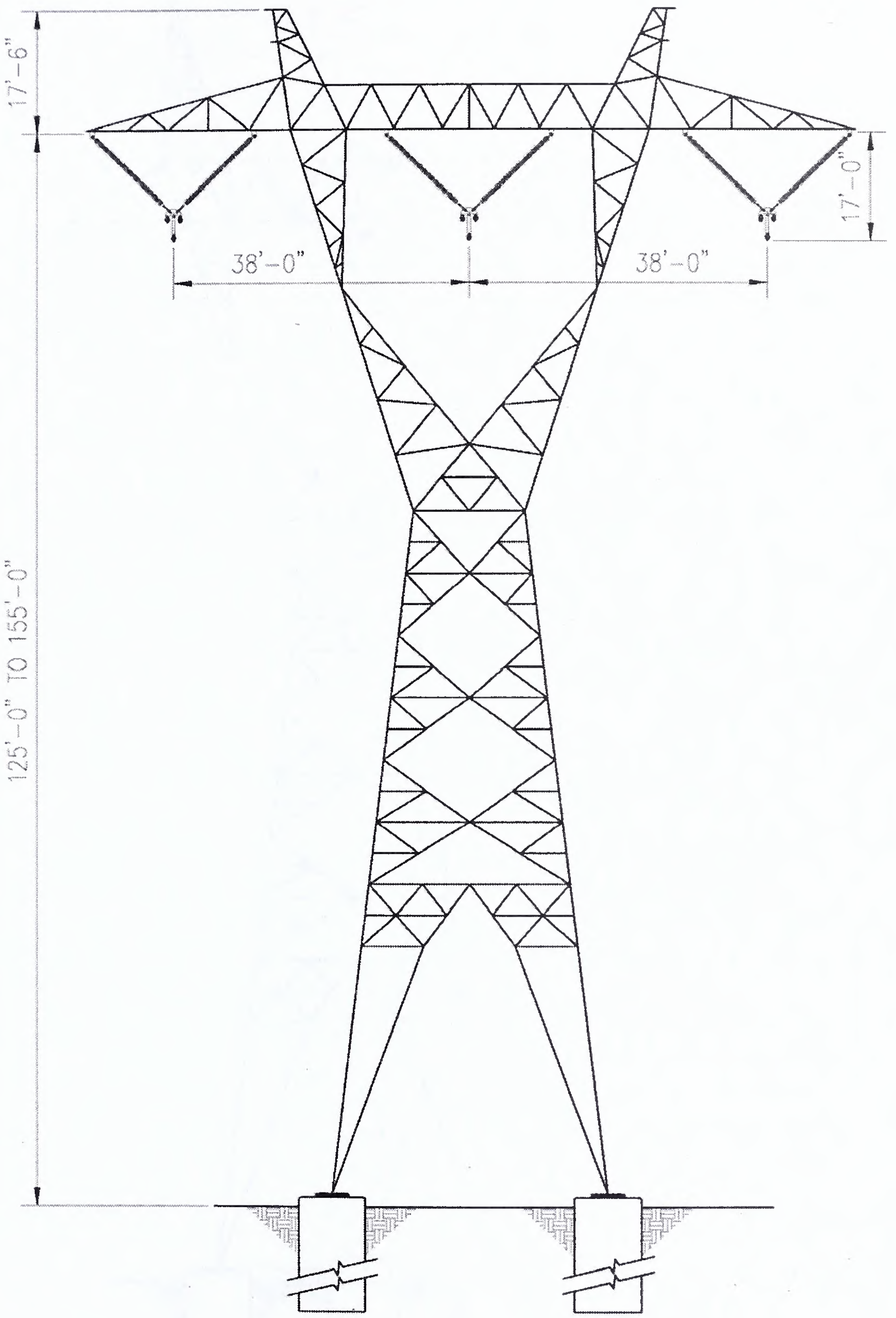
Figure 2-5



500-kV Transmission Line
Typical Dead End Steel Pole
White Pine Energy Station Project

NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

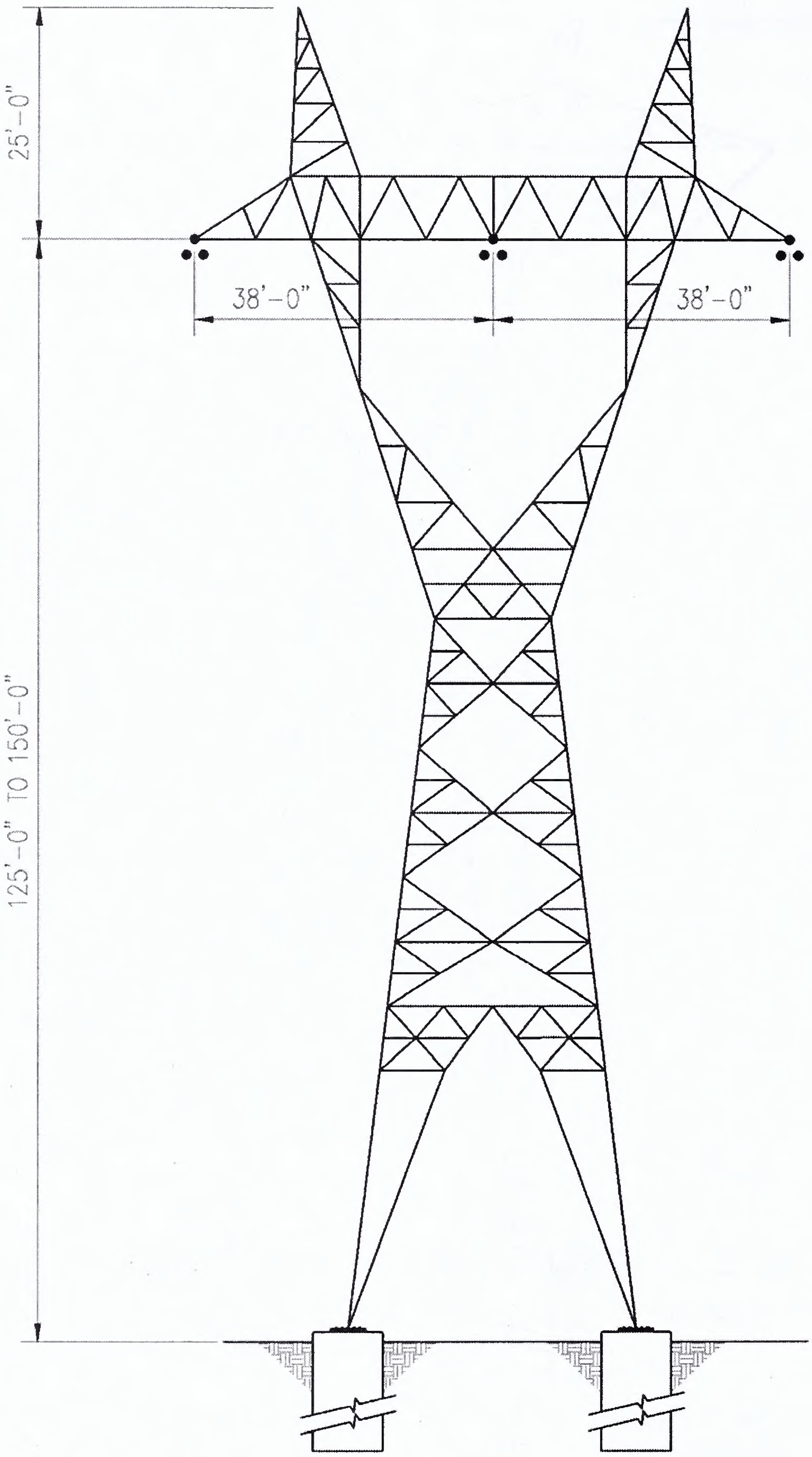
Figure 2-6



500-kV Transmission Line
Typical Single Circuit Tangent
White Pine Energy Station Project

NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

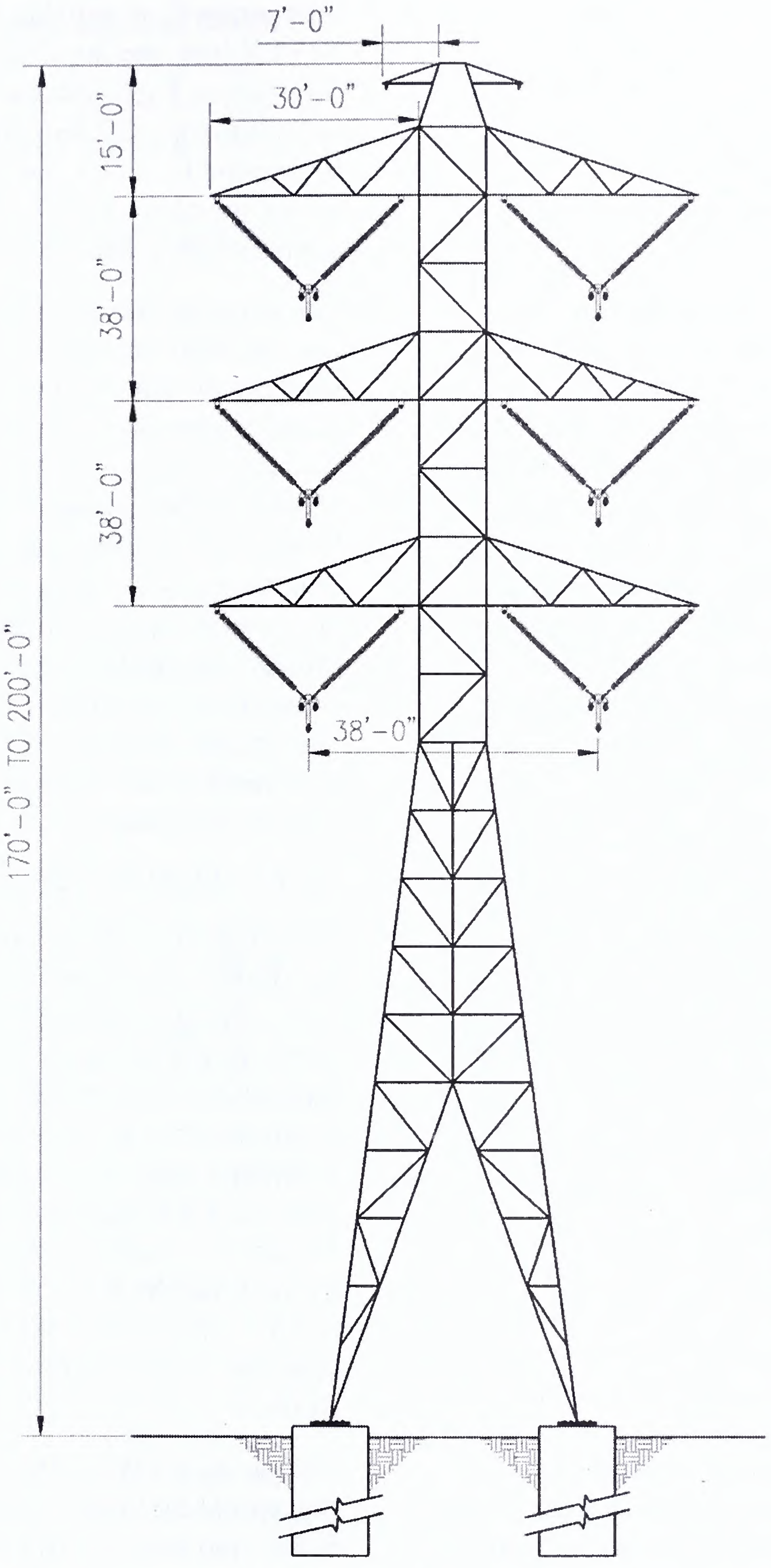
Figure 2-7



NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

500-kV Transmission Line
Typical Single Circuit Dead End
White Pine Energy Station Project

Figure 2-8



500-kV Transmission Line
Typical Tangent Tower Double Circuit
White Pine Energy Station Project

NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

Figure 2-9

Footings for each tower are generally expected to occupy approximately 28 square feet for single-circuit lattice towers, approximately 64 square feet for double-circuit lattice towers, and approximately 127 square feet for steel pole H-frame towers.

Access roads would be constructed to allow for construction access and the long term maintenance of the transmission line. The access roads would include spur roads to access the transmission line ROW and a centerline travel route that would generally run along the centerline of the transmission line ROW. Certain existing roads may be upgraded with new road construction utilizing overland construction techniques (crush and roll) with selective clearing of vegetation and avoidance of sensitive resources.

The average width of the new construction access roads would be approximately 15 feet; however, some areas may be widened up to 30 feet to allow for vehicle passing areas and other surface improvements. Widening beyond 30 feet is not expected; however, this may occur occasionally depending on field conditions. The average width of disturbance for upgrading existing roads is estimated to be 5 feet; however, this may vary considerably depending on field conditions. Following construction, the new construction access roads would be converted to a 10-foot-wide, two-track path that would be utilized for annual inspections, maintenance, and repair. An estimated 12 miles of existing roads would need to be upgraded and approximately 35 miles of new roads would have to be constructed.

2.2.3.2.4 Falcon-Gonder 345-kV Interconnection ROW

Two separate 160-foot-wide transmission line ROWs would be required to interconnect the existing Falcon-Gonder 345-kV line into the Thirtymile Substation. Each 160-foot ROW would be approximately 0.2 mile long. They would be parallel to each other with the centerline of each ROW separated by approximately 300 feet (see Figure 2-1).

The existing Falcon-Gonder 345-kV transmission line would be broken just south of the Thirtymile Substation and new transmission lines would be constructed to connect each segment to the Thirtymile Substation. The towers would be steel pole H-frame and dead end structures, as required. It is estimated that approximately four towers would be utilized, two pulling and tensioning sites would be required, and access roads along each transmission line ROW would be required for construction access and long term maintenance.

2.2.3.2.5 SWIP 500-kV Interconnection ROW

Two separate 200-foot-wide transmission line ROWs would be required to interconnect the planned SWIP transmission line with the Duck Creek Substation. Each ROW would be approximately 2.5 miles long and run west from the Duck Creek Substation to the planned SWIP transmission line (see Figures 2-1 and 2-2). These ROWs would parallel the Duck Creek to Thirtymile 500-kV line ROW with 500 feet of separation between the centerlines of each ROW.

The planned SWIP 500 kV transmission line would be looped into the Duck Creek Substation and new transmission towers would be erected to connect each segment into the 500-kV equipment at the Duck Creek Substation. The towers would be steel pole H-frame and dead end structures, as required. It is estimated that approximately 24 towers would be utilized, four pulling and tensioning sites would be required, and access roads along each transmission line ROW would be required for construction access and long term maintenance.

2.2.3.3 Water Supply System ROW

The Station would require water for construction, process, cooling, potable, and fire protection purposes. Instantaneous water usage at the power plant would be approximately 2,000 gallons per minute (gpm) under normal operating conditions. At higher ambient temperatures, the power plant would utilize water spray augmentation to increase the cooling efficiency and, as such, the instantaneous water usage would increase to approximately 6,000 gpm. The maximum anticipated water usage at the Station would be 5,000 acre-feet annually.

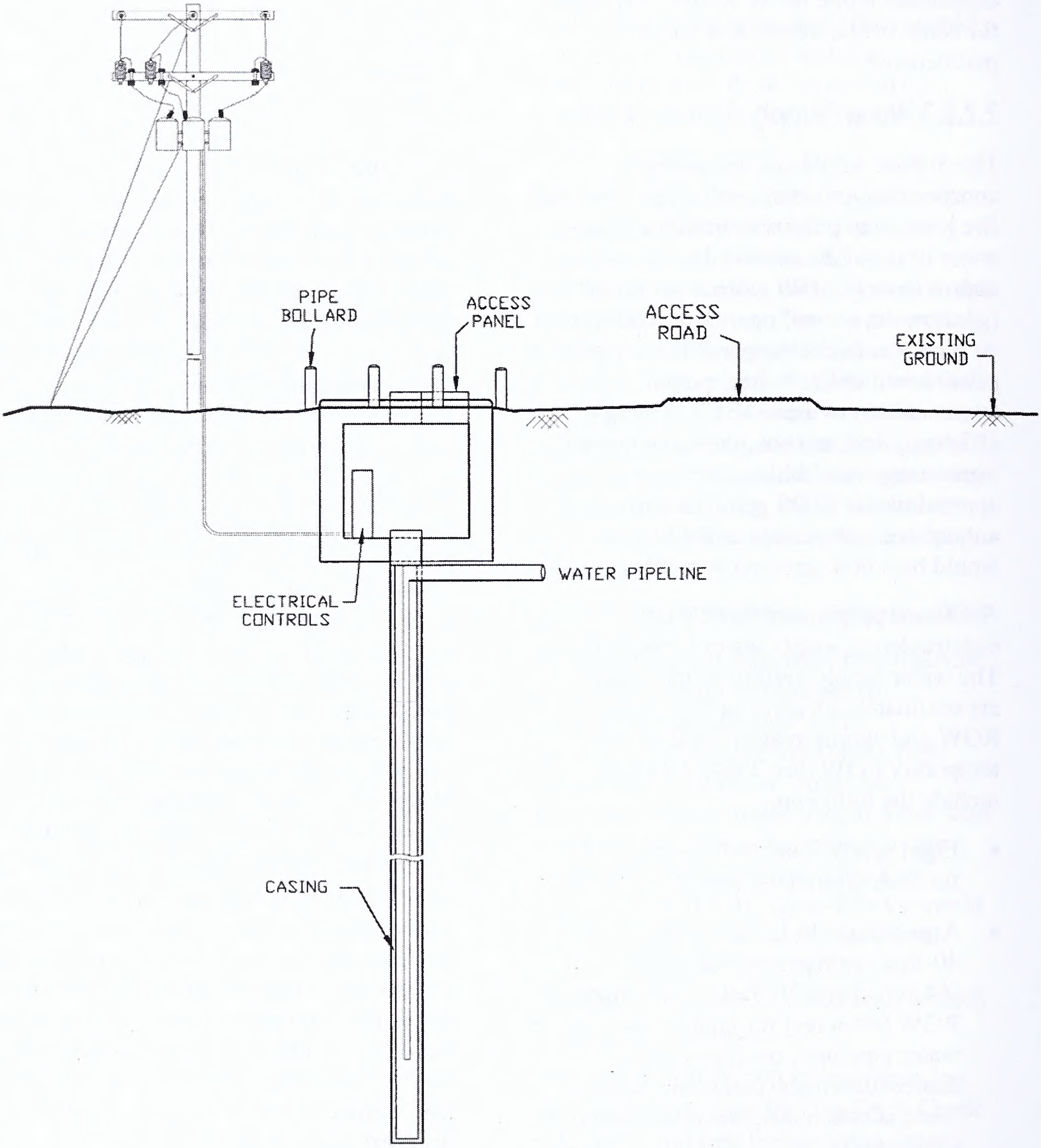
A water supply system would be constructed to supply water to the Station. The water supply system would require approximately 68 acres of permanent ROW and approximately 50 acres of temporary ROW (see Table 2-1) and include the following:

- Eight approximately 1/2-acre ROWs for each ground water well
- Approximately 13 mile-long, 40-foot-wide permanent ROW (64 acres) and 30-foot-wide temporary ROW (48 acres) for underground water pipelines, overhead electric distribution lines, communications lines, access roads, and other facilities as necessary
- Approximately 2-acre temporary ROW as a staging area for the placement of materials and equipment during construction

2.2.3.3.1 Ground Water Well ROW

The Station would use up to eight ground water wells for water supply. Construction and operation of the ground water wells would occupy approximately 0.2 acre total. The wells would be approximately 1,000 feet deep and withdraw water from the basin-fill aquifer. Each well is permitted to withdraw up to 3 cubic feet per second of water. The location for the ground water wells associated with the water supply system is constrained by defined well locations as specified under permits issued to White Pine County by the Nevada State Engineer's Office. Figure 2-1 depicts the locations where the eight water wells would be drilled.

An underground vault (approximately 8 feet by 8 feet by 8 feet) would be constructed at each well site to house the well and control equipment. The vault floor, walls, and roof would be constructed of concrete. A two-panel hinged metal door would be installed in the roof to provide access. Each well would have a 250- to 600-horsepower motor to accommodate the pumping requirements for the well. The ultimate motor size would be determined based on the pumping requirements of the well and its distance from the power plant. At the well site, the electrical feed for the motor and other electrical equipment would be buried underground from the electric distribution line to the well. Pipe bollards (pipes installed in the ground as a barrier) would be installed above ground around the vault for visibility and to protect the vault from vehicular traffic. A typical well site is depicted in Figure 2-10.



Typical Groundwater Well Site
White Pine Energy Station Project

Figure 2-10

2.2.3.3.2 Water Supply System Linear Facilities ROW

One 40-foot-wide permanent ROW and one 30-foot-wide temporary ROW would extend from the power plant site approximately 13 miles generally north to each of the ground water wells (see Figure 2-1). The water supply system linear facilities would include the underground water pipelines, overhead electric distribution lines, access roads, and communication lines. They would generally run parallel to one another in the same ROW as depicted in Figure 2-11.

Underground Water Pipelines

Underground water pipelines would be constructed to connect each of the wells and to transport the water to the power plant site. The diameter of the pipeline would vary from 10 inches to 30 inches depending on the distance from the power plant and the amount of water being transported. The pipeline would be constructed of a ductile iron, steel, high-density polyethylene and/or concrete. No permanent disturbance is expected for the underground water pipelines.

Overhead Electric Distribution Lines

New electric distribution lines would be constructed from the plant switchyard to each ground water well and generally run parallel to the underground water pipeline. The distribution line would consist of a 13.8-kV circuit supported from single wood poles up to approximately 55 feet tall and spaced generally at 200- to 300-foot intervals. The single wood poles would include avian predator perch deterrents with the intent of mitigating potential impacts to greater sage-grouse and other species susceptible to avian predation. In addition, any nests constructed on transformer cross members would be physically removed, as allowed by law. Figure 2-12 shows a depiction of the typical structure design.

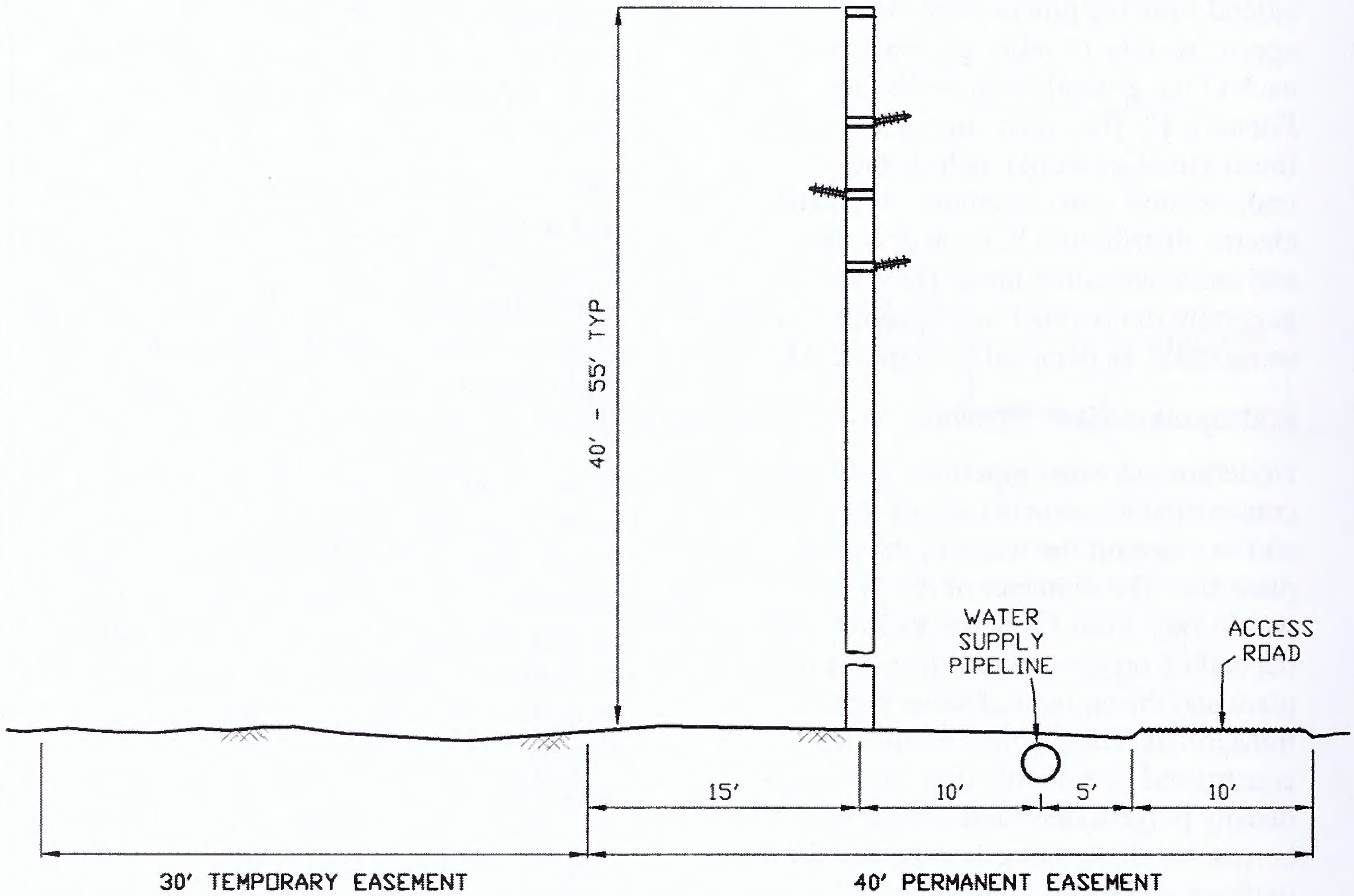
For turning structures and at other select pole locations, guy wires would be used to aid in stabilizing the structure as shown in Figure 2-13. The guy wire would extend up to approximately 35 feet from the structure.

The base of the guy wire would be fenced and within the permanent ROW, and the first 10 feet of guy wire would be marked with safety reflectors, high-visibility tape or plastic, or a similar material to make it highly visible to the public and wildlife species.

Pole-mounted transformers would be located at each ground water well site to transform the 13.8-kV distribution voltage down to the voltage required by the well pumps and electrical equipment installed at each well. A depiction of the typical on-pole structure design is shown in Figure 2-14. The electric distribution lines would be associated with the poles and guy wires, which are estimated to occupy less than 0.05 acre total.

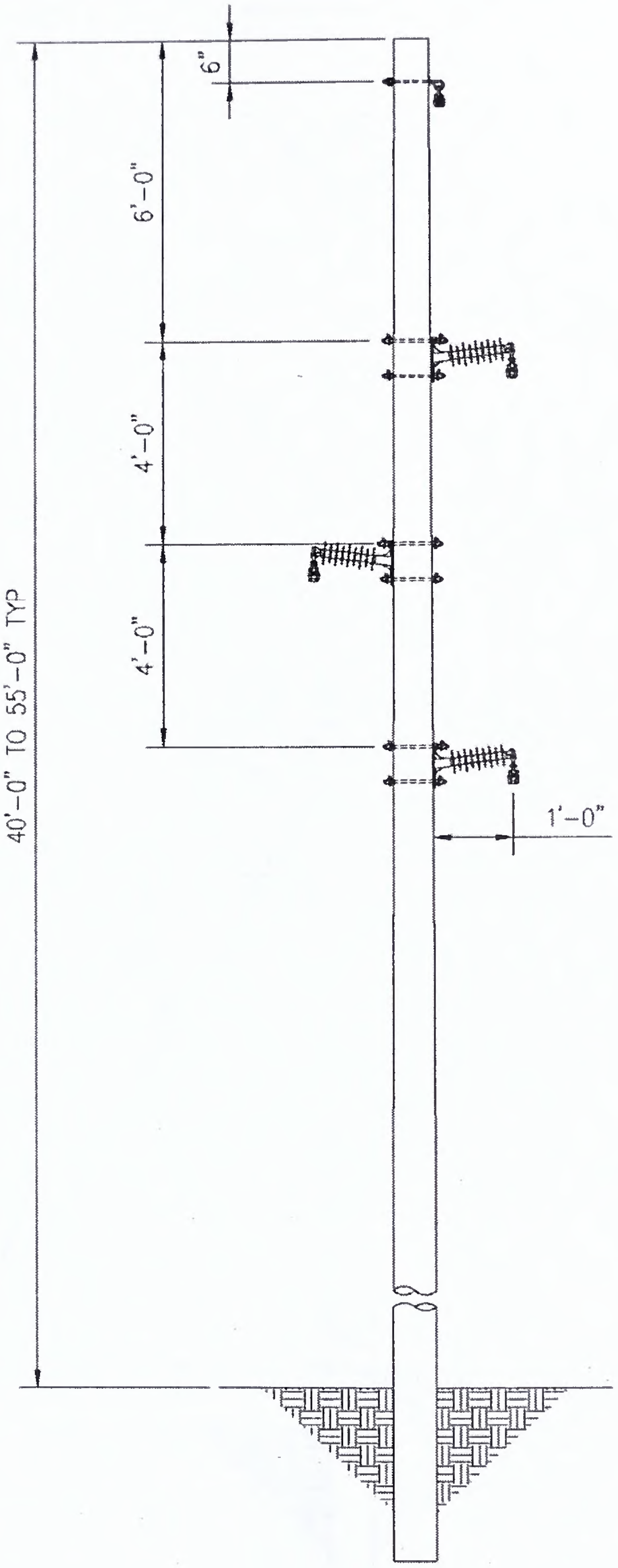
Access Roads

An access road would be located along the water pipeline and electrical distribution line for maintenance purposes and to provide access to each well site. Approximately 2 miles of the access road would be improved with gravel to allow for access to the two closest wells during wet periods. The remainder of the access road would remain dirt with limited improvements. Construction would be conducted utilizing overland construction techniques (crush and roll) with selective clearing of vegetation and avoidance of sensitive resources. Roads would typically be 10 feet wide.



Water Supply System
Linear Facilities
White Pine Energy Station Project

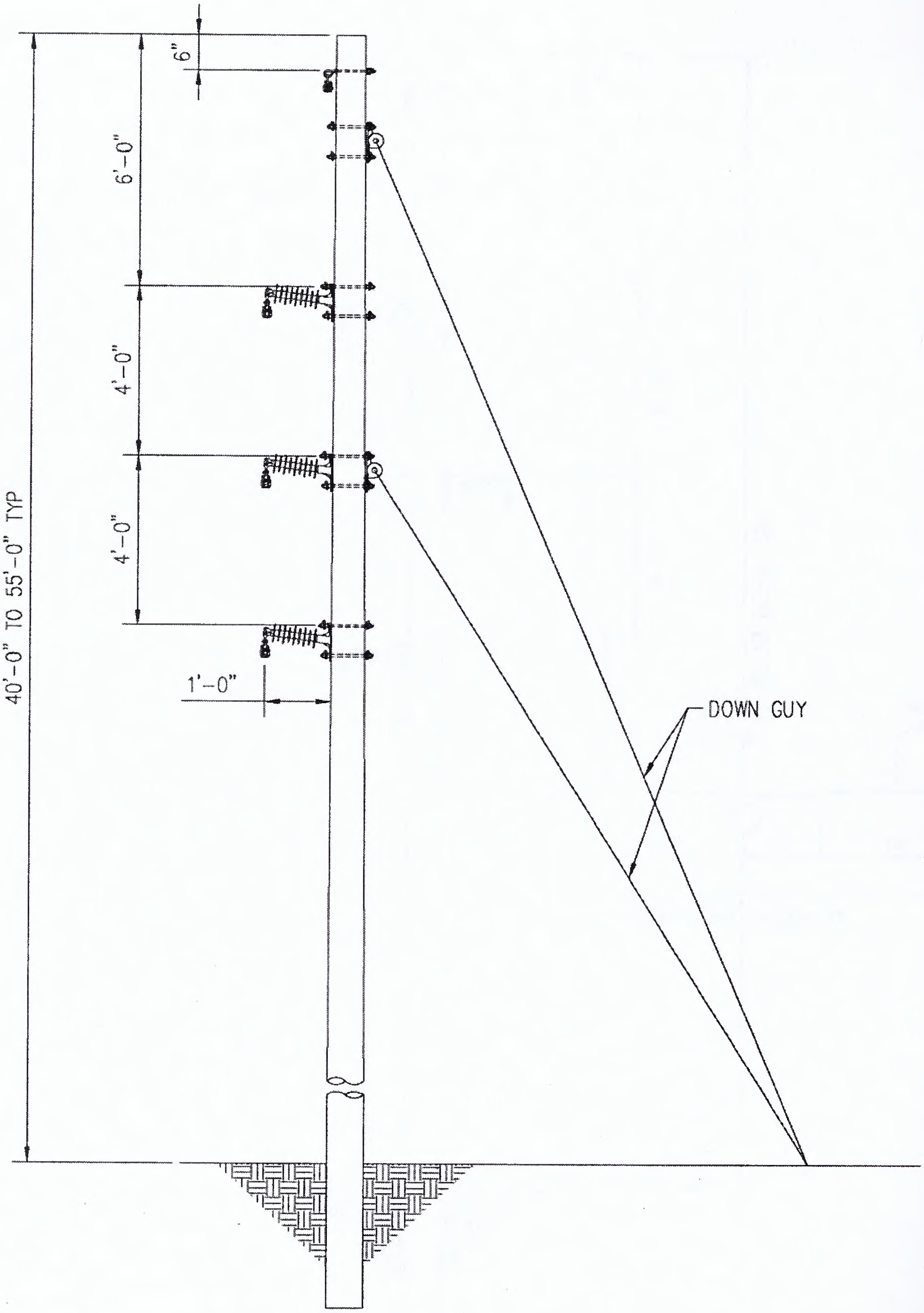
Figure 2-11



NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

Typical Tangent Single Wood Pole
White Pine Energy Station Project

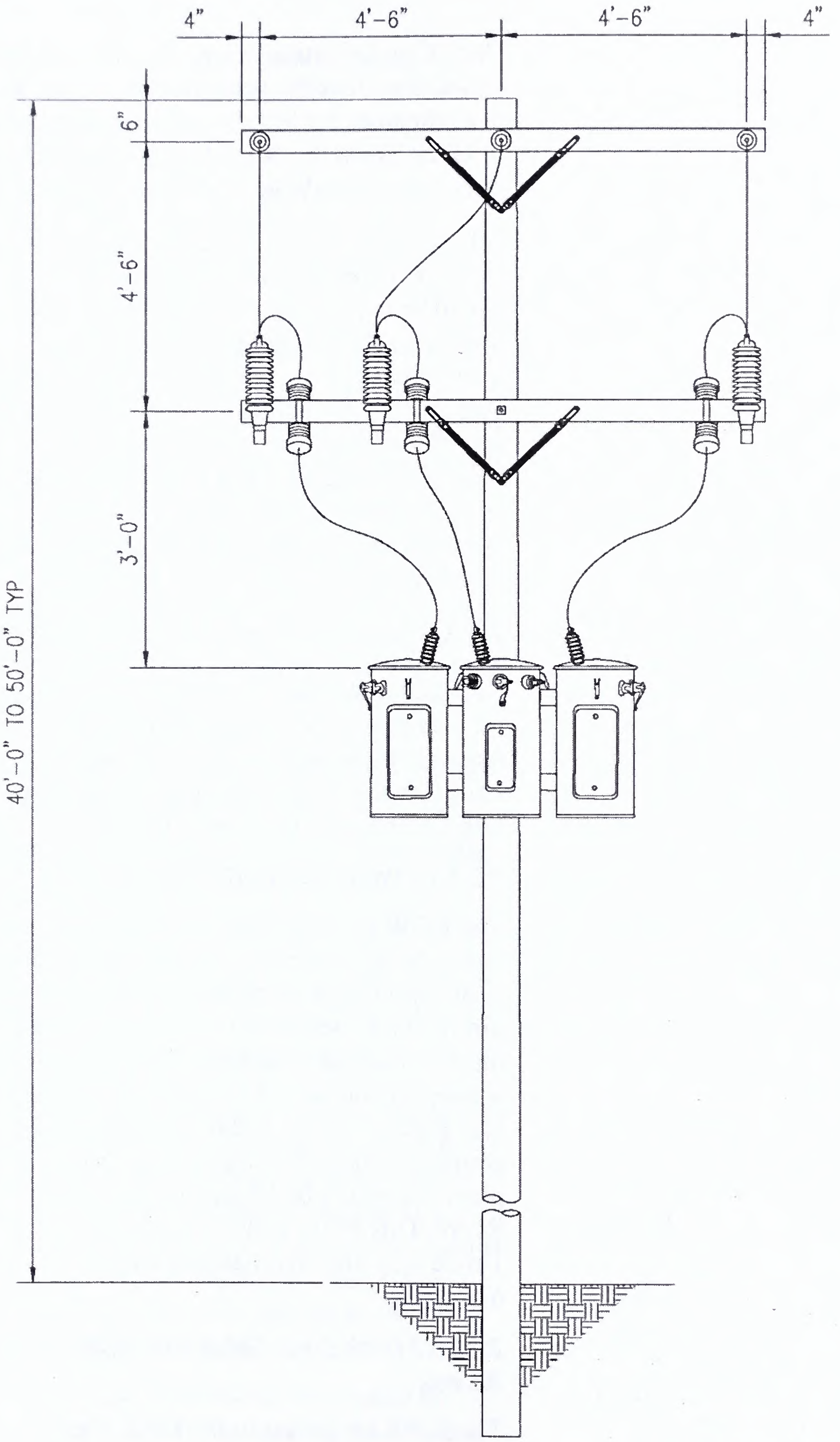
Figure 2-12



NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

Typical Angle Single Wood Pole
White Pine Energy Station Project

Figure 2-13



Typical 13.8kV Three Phase Transformer Bank Wood Pole White Pine Energy Station Project

NOTE:
Perch deterrents/nest construction barriers will be utilized on all electrical transmission support structures in all habitats except pinyon-juniper.

Figure 2-14

Communication Lines

Communication lines would be installed to remotely operate the wells and would either be buried along the underground water pipeline or placed on the same poles as the overhead electric distribution line. Alternatively, wireless communication systems would be used. No significant additional permanent disturbance is expected for the communication lines.

2.2.3.3.3 Construction Staging Area ROW

A temporary ROW would be utilized during the construction of the water supply system as a staging area for the placement of materials and equipment (see Figure 2-1). This ROW would be approximately 100 feet wide by 871 feet long. Prior to using the staging area, vegetation would be removed and temporary fencing installed. Upon completion of construction, all materials, equipment, and fencing would be removed. Disturbed areas will be rehabilitated as described in Appendix A, *Best Management Practices.*

2.2.3.4 Rail Spur ROW

A rail spur approximately 1.3 miles long would be constructed from the existing NNR to a rail loop that would be constructed on the power plant site (see Figures 2-1 and 2-2). The rail spur would generally run east-west and enter the power plant site near its northwest corner. The rail spur would include all facilities necessary for the operation of the railroad including rail, cross ties, other track material, ballast, drainage facilities, and access roads. A single-span or girder bridge would be used for the crossing of Duck Creek. These bridge types were selected to minimize impacts to wetlands and to maintain surface water flows in Duck Creek, and are discussed further in Section 2.5.7, *Alternative Structure Designs for Crossing Duck Creek.* Section 2.5.6, *Alternative Rail Spurs,* describes the process that was used to evaluate and select the rail spur crossing of Duck Creek that would have the least effect on wetlands and wildlife.

A temporary 30-foot-wide ROW located adjacent to the permanent rail spur ROW would be required during construction. The temporary ROW would occupy approximately 5 acres and be reclaimed after construction is complete. The permanent rail spur ROW would be 35 feet wide at areas crossing Duck Creek and wetlands, 70 feet wide at areas outside of Duck Creek and wetlands, and occupy approximately 9 acres (Table 2-1).

2.2.3.5 Access ROW

Access ROWs would be required to provide road access and certain utility access (for example, phone and fiber optics) to the power plant site, Duck Creek Substation, and Thirtymile Substation.

2.2.3.5.1 Power Plant ROW Access

The ROW for access to the power plant site would be 60 feet wide. A paved two-lane road would be constructed over the existing dirt road that begins at U.S. 93 (near mile marker 86.9) and run west along the southern boundary of the power plant site (see Figure 2-1). In addition, underground communications facilities for the power plant site would be located in this access ROW. This ROW would be approximately 1 mile long and cover approximately 6 acres.

2.2.3.5.2 Duck Creek Substation ROW Access

The ROW for access to the Duck Creek Substation would be 30 feet wide. A gravel road and underground communication lines would be located in this ROW. They would begin at the end of the power plant site access and run west along the southern boundary of the power plant site for approximately 0.05 mile, then continue south along the eastern boundary of the power plant site to the Duck Creek Substation ROW boundary (see Figure 2-1). This ROW would be approximately 0.3 mile long and cover approximately 1 acre.

2.2.3.5.3 Thirtymile Substation ROW Access

The ROW for access to the Thirtymile Substation would be 30 feet wide. A gravel road would be constructed over the existing dirt road that begins at U.S. 50, run in a southerly direction for approximately 0.5 mile and then proceed easterly for approximately 0.1 mile to the Thirtymile Substation ROW boundary (see Figure 2-15). Underground communication lines to the Thirtymile Substation would also be located in this ROW. This ROW would be approximately 0.6 mile long and cover approximately 2 acres.

2.2.3.6 Additional Construction ROW

Offsite activities would be necessary to support construction of the Station, including the need for construction power and additional earth and rock materials.

2.2.3.6.1 Electric Distribution Line

A temporary 69-kV electric line would be constructed to provide power during the construction of the Station. This electric distribution line would be located in a temporary ROW that would extend from an existing 69-kV distribution line to the power plant site. This temporary ROW would be 40 feet wide.

The electric distribution line would be constructed from the existing distribution line, located approximately 0.6 mile east of U.S. 93, to the power plant site along the northern side of the existing dirt road that connects to U.S. 93 near mile marker 86.9 (see Figure 2-1). This ROW would be approximately 1.3 miles long, resulting in a temporary ROW grant of approximately 6 acres. Upon completion of construction, the poles and lines would be removed and the temporary ROW relinquished.

2.2.3.6.2 Mineral Materials Sale Area

One or more borrow areas, via mineral materials sale, would be established to provide earth and rock materials during site preparation and throughout the construction process. The materials would be used for concrete and asphalt mixes, road base, lining of dikes, and rock surfaced areas. A mineral materials sale area would cover approximately 40 acres within the area identified in Figure 2-1 and shown in detail in Figure 2-16. This borrow area would be located in Section 35, Township 22 North, Range 63 East. A fence, berm, or signs would be established at the borrow area entry to prevent public access. Upon completion of construction, the borrow area(s) would be recontoured and reclaimed in accordance with BLM regulations.

2.2.3.7 Connected Actions

Certain third-party infrastructure projects are closely connected to the construction and operation of the Station, but they are not part of the Proposed Action. Two major infrastructure projects identified by WPEA that have been proposed or are being considered by other parties include upgrading and operating the NNR from the Union Pacific Railroad interchange at Shafter, Nevada, to the Rail Spur ROW, and constructing a portion or all of the SWIP 500-kV transmission line. Because of their independent nature, NNR upgrade and operation and the SWIP are also cumulative projects, which are analyzed in Chapter 4.

2.2.3.7.1 Rehabilitation and Operation of Nevada Northern Railway

The NNR is an existing railroad that runs from Cobre, Nevada, to Ely, Nevada, and is currently inactive from Cobre to a point near McGill, Nevada. The City of Ely and the White Pine Historical Railroad Foundation own and plan to rehabilitate the NNR. The City of Ely is proposing to upgrade approximately 109.9 miles of NNR track and corridor (collectively referred to as the NNR Rail Line in this discussion) from milepost (MP) 18.5 in Shafter at the Union Pacific mainline connection to MP 128.4 at McGill Junction.

The rail spur for the proposed White Pine Energy Station power plant would connect to the upgraded NNR at approximately MP 103 under the Proposed Action. The portion of the NNR south of the Alternative 1 rail spur (see Section 2.3.3.7, *Connected Actions*) is not considered part of the connected action because Station-related coal trains will not travel further south than the Alternative 1 rail spur.

Upgrading the rail line to Federal Railroad Administration Class 3 Track would permit use of the NNR for commercial freight service and allow for the expansion of tourist operations on the NNR north to Shafter (David Evans and Associates, Inc., 2002).

General and specific track restoration activities that would be required to upgrade the NNR Rail Line are described in detail in *Nevada Northern Railroad Project Engineering Study and Cost Estimate* (R. L. Banks & Associates, Inc., 2002). These activities would occur whether or not the White Pine Energy Station is constructed and would all take place within the existing non-federal NNR alignment, which is generally 200 feet wide. General restoration activities include the following:

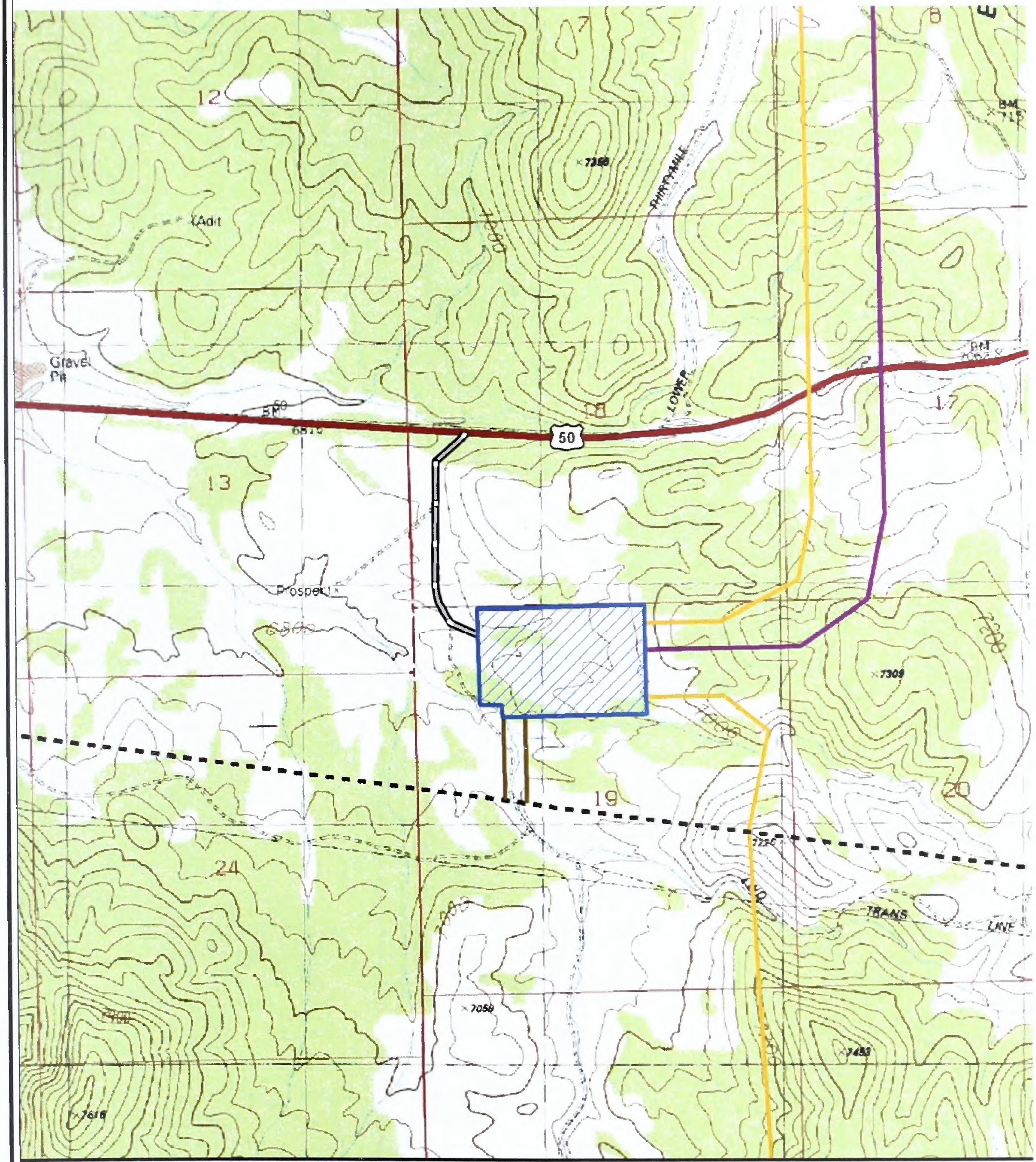
- Replace the existing 60-pound rails with 115-pound rails
- Replace approximately 42,000 crossties
- Dump and distribute ballast material
- Surface alignment of the entire NNR Rail Line
- Remove existing vegetation within the NNR Rail Line and treat chemically to retard future growth

Between Shafter and the Proposed Action rail spur site, 16 corrugated metal pipe culverts and 6 concrete box culverts would need to be replaced or repaired, 19 rail/road crossings would need reconstruction, and 12 sidings should be replaced with heavier rail.

It is anticipated that rehabilitation of the NNR would take one or two construction seasons to complete.

The purposes and needs identified by the City of Ely in their proposal to restore and operate the NNR Rail Line are as follows (David Evans and Associates, Inc., 2002):

- Reinstate freight rail operations and expand tourist excursions on the NNR
- Improve freight rail service in the region
- Generate revenue for the City of Ely
- Provide a connection to the Union Pacific mainline at Shafter
- Create job opportunities in the surrounding community
- Promote the economic diversification of the region



0 1,000 2,000 Feet

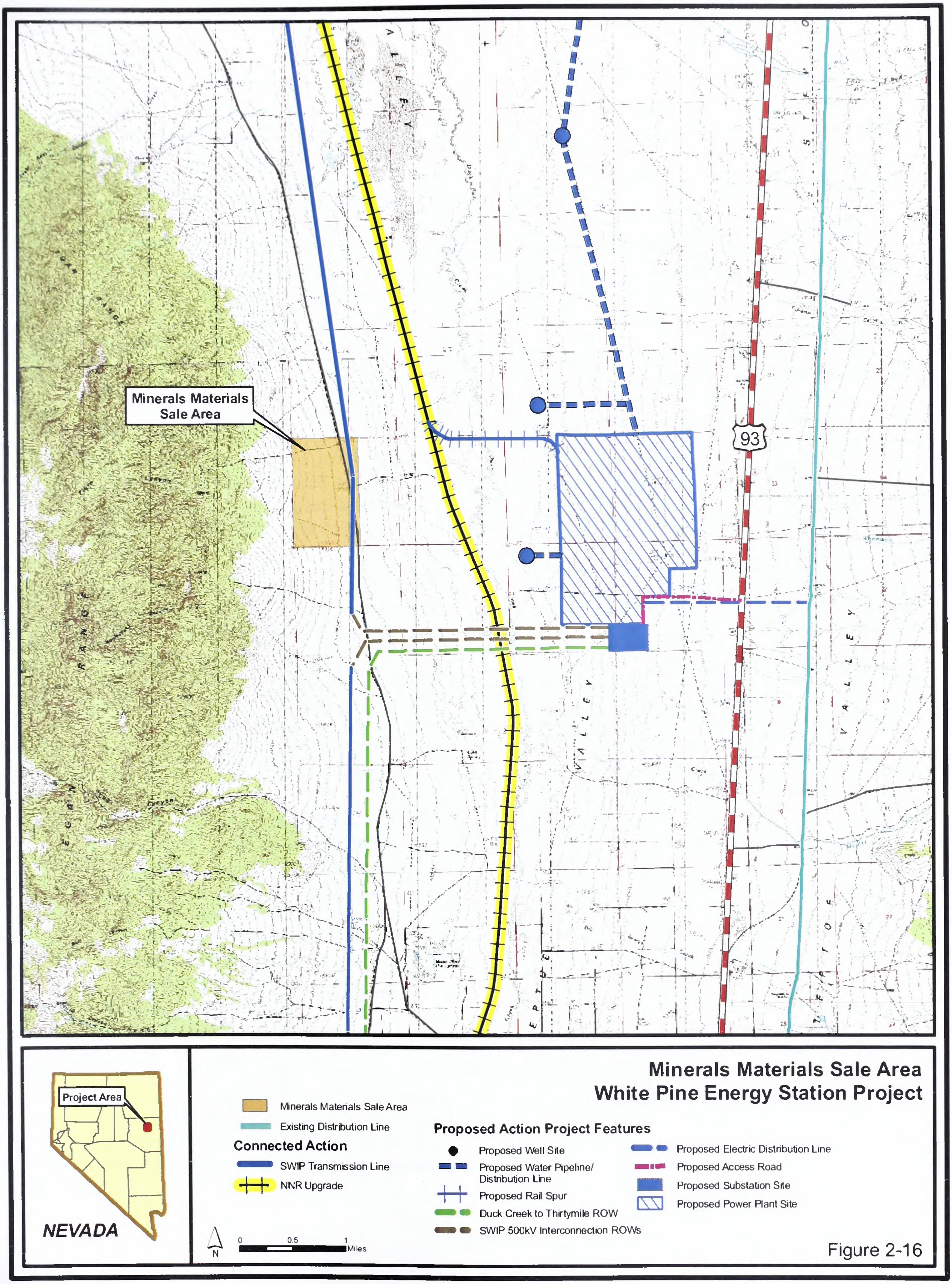
N

Legend

- Thirtymile Substation ROW
- Thirtymile Substation ROW Access
- Existing Falcon-Gonder 345-kV Transmission Line
- Connected Action - SWIP Transmission Line
- Duck Creek to Thirtymile Transmission Line ROW
- Falcon-Gonder 345-kV Interconnection ROWs

Thirtymile Substation ROW
White Pine Energy Station Project

Figure 2-15



Minerals Materials Sale Area
White Pine Energy Station Project

Figure 2-16

The City anticipates that the customer base will include the oil industry in northern Nye County, the mine at Ruth, local businesses, and the potential for tourist excursions and special events. The upgraded NNR Rail Line also would provide access to the new rail spur and ROW for trains delivering coal to the proposed White Pine Energy Station power plant. WPEA would negotiate a lease with the City of Ely for the use of the upgraded section of track by coal trains. The projection includes formation of a Railroad Redevelopment District, renovation of the track to Class 3 status, hauling coal between Shafter and the Rail Spur ROW for the electrical power plant, and providing rail freight service for additional local clients as well as those industries attracted to the County because rail freight service is available.

Quadra Mining Ltd. also may consider using the upgraded NNR Rail Line rather than trucks to ship ore from the Robinson Mine, which is west-northwest of Ely. Quadra currently operates Robinson Mine (Quadra Mining Ltd., 2005b). They are the largest private employer in White Pine County. The mine produces copper and gold. Quadra is making capital investments to produce molybdenum as well. Concentrate from the mine is shipped by truck to Wendover and loaded onto Union Pacific trains for delivery to customers. In 2005, the mine produced 126 million pounds of copper and 85,000 ounces of gold, and in 2006, production was projected to decrease slightly to 115 million pounds of copper and 55,000-60,000 ounces of gold (Quadra Mining Ltd., 2005a).

2.2.3.7.2 Southwest Intertie Project

The Southwest Intertie Project is the construction, operation, maintenance, and termination of the Southwest Intertie 500-kV electrical transmission line project (SWIP). Idaho Power received a Record of Decision, in 1994, for a 500-kV electric transmission line from the Midpoint Substation in Idaho to a new electric substation to be located in Clark County, Nevada, commonly known as the SWIP. The SWIP transmission line ROW passes through White Pine County near the sites that WPEA is considering for the Station and contemplated the construction of a new electric substation near Robinson Summit in White Pine County.

The SWIP transmission line ROW on public land is 200 feet wide (100 feet on each side of center) and approximately 406 miles long. The SWIP also includes three 80-acre substation sites, two 15- to 20-acre series compensation station sites, and eight 0.25-acre microwave communication sites. Within the 200-foot-wide transmission line ROW, a fiber optic communication cable within the grounding shield wires would be installed on top of the transmission line towers.

The 406-mile-long ROW grant extends from the Midpoint Substation in Midpoint, Idaho, to the Harry Allen Substation in Clark County, Nevada and passes through the White Pine Energy Station project area. In 2005, LS Power Associates, L.P., which owns WPEA, exercised its option to purchase the SWIP ROW from Idaho Power Company.

Depending on the ultimate capacity of the Station, the customers for the power produced by the Station, and other factors such as the development of wind generation projects in White Pine County, construction of a portion of the SWIP or a similar transmission project may be required. WPEA is not requesting approval for the construction of transmission facilities other than those specifically described for the Station in Section 2.2.3.2, *Electric Transmission Facilities ROW.* Components of the SWIP and Station would be interconnected as described in

Section 2.2.3.2, *Electric Transmission Facilities ROW*.

2.2.4 Construction Activities

2.2.4.1 Overview

The primary components of the Proposed Action that would be constructed include the power island, coal storage and handling, waste handling and disposal, evaporation pond, electric transmission facilities, water supply system, rail spur, and access roads. The Station would include up to three generating units, which may be constructed concurrently or in stages. Because WPEA wants to have the flexibility to construct the Station in up to three phases to align with and meet future market demands, the following text discusses several construction sequences and scenarios depending on the number of generating units constructed.

2.2.4.2 Construction Schedule and Workforce

Construction of the Station is expected to commence in late 2007, subject to receiving all regulatory approvals and securing financing. Table 2-2 depicts the estimated average number of construction workers per month to construct the Station under three possible scenarios. These scenarios vary depending on the number of generating units to be constructed, as well as their construction sequence. For example, under Scenario 2, it is estimated to take approximately 46 months to complete the construction of the first generating unit and associated infrastructure. The workforce required to construct the first generating unit and infrastructure is expected to average approximately 600 construction workers, with a peak employment of approximately 1,200 workers. Table 2-2 (Scenario 2) shows the estimated average number of construction workers per month, assuming construction of a single generating unit.

If a second generating unit is constructed concurrently with the first generating unit (see Table 2-2, Scenario 1), the peak workforce number is expected to stay roughly the same (1,200 workers) but with the peak period of employment lasting for a longer period of time and the average workforce increasing to approximately 760 workers. For example, construction of a second generating unit concurrently with the first unit would generally add another 6 to 9 months of construction activity on the site, for a total of approximately 52 to 55 months to construct the first and second units. On the other hand, if construction of the second generating unit were not started until after the first unit was complete (see Table 2-2, Scenario 2), construction of the second unit would likely require an additional 44 months of construction activity, average approximately 500 workers, and peak at the same (1,200 workers) workforce as for the first unit.

As noted previously, WPEA wants to have the flexibility to construct the Station in up to three phases. These potential construction scenarios are as follows:

- **Scenario 1.** Construct Units 1 and 2 concurrently, followed by some delay on Unit 3. Construction requirements and effects would be very similar if this scenario was reversed such that construction of Unit 1 occurred first, then a delay occurred and Units 2 and 3 are constructed concurrently. As such these two options are treated as a single scenario.
- **Scenario 2.** Construct Unit 1 followed by a delay, construct Unit 2 followed by a delay, then construct Unit 3.
- **Scenario 3.** Construct all three units concurrently with 6 to 9 months added to the schedule for the second and third units each.

TABLE 2-2

Estimated Average Number of Construction Workers per Month for Three Construction Scenarios

	Scenario 1		Scenario 2			Scenario 3
	Units 1 & 2 (concurrently)	Unit 3 (later)	Unit 1	Unit 2 (later)	Unit 3 (later)	Units 1, 2, & 3 (concurrently)
Month	Construction Employment		Construction Employment			Construction Employment
1	50	20	50	20	20	50
2	100	50	100	50	50	100
3	200	120	170	120	120	200
4	250	130	220	130	130	250
5	300	150	250	150	150	300
6	320	160	300	160	160	320
7	340	170	320	170	170	350
8	360	180	340	180	180	400
9	380	190	360	190	190	425
10	400	200	380	200	200	475
11	500	250	400	250	250	550
12	600	300	450	300	300	650
13	700	350	500	350	350	750
14	800	400	550	400	400	850
15	850	450	600	450	450	900
16	900	500	675	500	500	950
17	950	550	750	550	550	1000
18	1000	600	825	600	600	1100
19	1100	700	900	700	700	1140
20	1120	720	950	720	720	1180
21	1140	740	1000	740	740	1200
22	1160	760	1050	760	760	1200
23	1180	830	1075	830	830	1200
24	1200	950	1100	950	950	1200
25	1200	1050	1150	1050	1050	1200
26	1200	1150	1200	1150	1150	1200
27	1200	1200	1200	1200	1200	1200
28	1200	1200	1200	1200	1200	1200
29	1200	1200	1200	1200	1200	1200
30	1200	1100	1200	1100	1100	1200
31	1200	900	1150	900	900	1200

TABLE 2-2

Estimated Average Number of Construction Workers per Month for Three Construction Scenarios

	Scenario 1		Scenario 2			Scenario 3
	Units 1 & 2 (concurrently)	Unit 3 (later)	Unit 1	Unit 2 (later)	Unit 3 (later)	Units 1, 2, & 3 (concurrently)
Month	Construction Employment		Construction Employment			Construction Employment
32	1200	770	1100	770	770	1200
33	1200	750	900	750	750	1200
34	1150	730	770	730	730	1200
35	1100	710	750	710	710	1200
36	1050	510	730	510	510	1200
37	1000	330	710	330	330	1200
38	950	260	510	260	260	1200
39	930	230	330	230	230	1200
40	910	190	260	190	190	1200
41	890	140	230	140	140	1200
42	840	120	190	120	120	1200
43	790	70	140	70	70	1150
44	740	20	120	20	20	1125
45	640	—	70	—	—	1075
46	540	—	20	—	—	1025
47	440	—	—	—	—	975
48	340	—	—	—	—	950
49	240	—	—	—	—	925
50	140	—	—	—	—	900
51	90	—	—	—	—	850
52	40	—	—	—	—	800
53	—	—	—	—	—	750
54	—	—	—	—	—	700
55	—	—	—	—	—	600
56	—	—	—	—	—	450
57	—	—	—	—	—	350
58	—	—	—	—	—	250
59	—	—	—	—	—	150
60	—	—	—	—	—	100
61	—	—	—	—	—	50
Average Monthly	**760**	**502**	**618**	**502**	**502**	**925**
Peak	**1,200**	**1,200**	**1,200**	**1,200**	**1,200**	**1,200**

For the purposes of analyzing the potential broad range of construction-related effects in this EIS, it is assumed that the delay between construction phases in Scenarios 1 and 2 would be at least 3 years. Scenario 1 was selected as the worst-case analysis.

Normal construction hours are expected to fall between 6 a.m. and 6 p.m. on weekdays. However, these hours may require adjustment because of scheduling constraints and other time-sensitive matters.

2.2.4.2.1 Construction Worker Housing

Peak employment during construction of the Station would reach approximately 1,200 workers. In order to meet the anticipated housing demands associated with the construction workforce, WPEA would implement the following housing strategies:

- Provide onsite construction worker housing for up to 1,000 workers within the power plant site by utilizing a combination of modular dormitory style housing and RV hook-ups (see discussion in Section 2.2.3.1.5).
- Establish one or more temporary housing areas in Ely to accommodate up to 300 workers and their families utilizing modular apartments and/or modular homes.
- Encourage the employment of local residents and subcontractors.

Assuming that up to 300 construction workers would come from the local workforce (that is, White Pine County or surrounding area), WPEA's proposed housing strategy would account for up to 1,600 workers (300 existing local families, 300 new families living in Ely, and 1,000 living onsite) versus the estimated peak workforce of 1,200 workers. The reason for this "oversizing" in planning is because it is not possible to predict the exact make-up of the workforce over the estimated 4- to 6-year construction period. The use of modular housing and the RV hook-ups would allow WPEA to install housing capacity as needed as the workforce increases over the construction period.

WPEA plans to work closely with the City of Ely to identify one or more areas suitable for temporary housing in or adjacent to Ely. Selection of the site(s) would be based on the availability of large tracts of land and the availability of existing infrastructure to minimize the impact on the City's utilities. WPEA would develop (through a subcontractor) housing facilities to accommodate up to 300 construction workers who would generally: (1) be working on the Station over a prolonged period, and (2) have a family that relocates with them. WPEA expects that the housing to be developed within Ely would be modular apartments and modular homes placed on concrete slabs. During the transition from construction to operations, permanent workers may live in the construction worker housing until permanent residences are established. Otherwise, upon the completion of construction, the modular facilities would be removed and the land could be used for future development in Ely.

2.2.4.3 Power Plant Construction

Construction activities at the power plant would include the following major phases:

- Surveying, site clearing, site preparation, and mobilization
- Foundation and below grade utilities construction
- Building and equipment installation

- Start-up, commissioning, and testing
- Site cleanup and project closeout

2.2.4.3.1 Surveying, Site Clearing, Site Preparation, and Mobilization

The first phase of construction would include surveying work, site clearing, site preparation, and mobilization. This work would include the use of heavy, diesel-powered equipment such as scrapers, bulldozers, dump trucks, and front-end loaders. The site preparation work would provide necessary grading for the plant facilities, establish access roads and parking areas for construction workers, and establish construction lay-down areas on the site. Site mobilization activities would include the delivery and setup of office trailers, warehouses, mechanic shops, onsite housing facilities, and installation of construction utilities (water, power, sewer, phone) and security facilities (guardhouse, fencing).

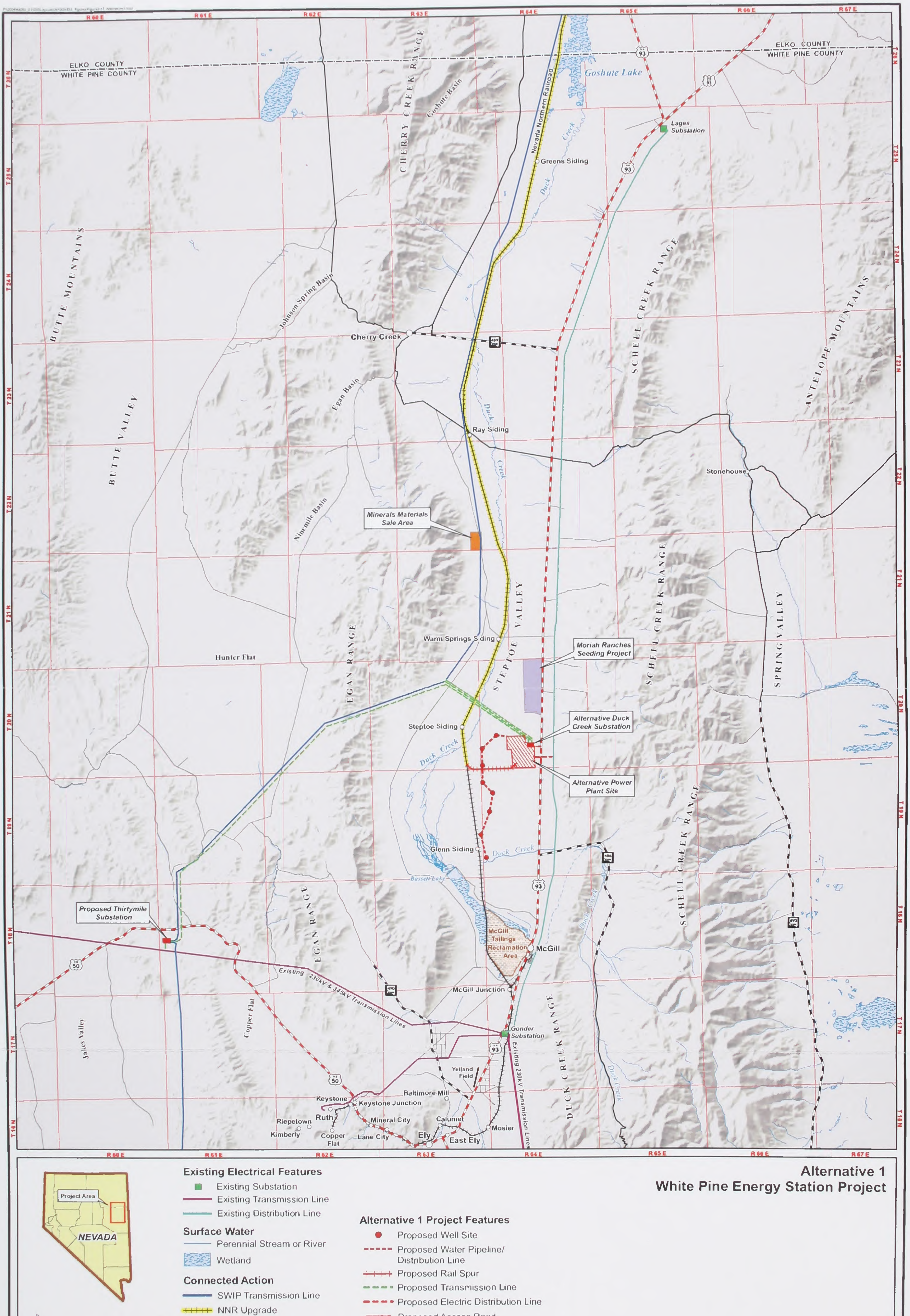
Earth and Rock Materials

Earth and rock materials would be used during site preparation and throughout the construction process. The potential offsite borrow area for sand, gravel, and aggregate materials was described in Section 2.2.3.6.2 and depicted in Figures 2-1 and 2-17. In addition, borrow areas may be established on the power plant site for the supply of earth and rock materials. The earth and rock materials would likely be transported to the place of use by truck.

Construction Utilities

An adequate and reliable source of construction water would be necessary to support construction activities, including the need for potable water, sanitary facilities, fire protection, concrete production, and dust control. The primary source of construction water would be provided through a partial construction of the water supply system. It is anticipated that two wells, and the associated ancillary facilities including pipelines, electric distribution lines, and water storage tanks, would be able to adequately provide the water needs during the construction period.

An adequate and reliable source of construction power would be necessary to support construction activities including the construction worker housing facilities, water supply system, construction trailers, and start-up, testing, and commissioning of the Station. The primary source of construction power would be through an interconnection to the 69-kV distribution line located just east of U.S. 93. A 69-kV distribution line would be constructed from the existing 69-kV distribution line to the power plant site as early as practical during the construction period. This electric distribution line would be constructed in a similar fashion to the electric distribution line for the water supply system as described in Section 2.2.4.5. Prior to the availability of power from this interconnection, onsite construction power would be provided by diesel-driven generators. An estimated 10 MW of electric power would be required to meet peak demands during construction, excluding electric power requirements for the start-up, testing, and commissioning of the Station, which would be provided through the Station's interconnection to the high-voltage transmission system.



Alternative 1
White Pine Energy Station Project

Figure 2-17

Security Facilities

Construction security would consist of a security office to provide space and facilities for security personnel, a guardhouse for security personnel at the entrance to the power plant site, security fencing around the power plant site, and security vehicles to patrol the site. Security personnel would be trained and uniformed with the primary responsibility of controlling access to the power plant site. All construction personnel would be issued identification badges that would be verified on entry and exit from the power plant site.

2.2.4.3.2 Foundation and Below Grade Utilities

The next major step would be to begin major foundation work and installation of below grade piping and electrical utilities. This work would involve heavy equipment such as excavators, dozers, loaders, concrete trucks, mixers, vibrators, pumps, trench digging equipment, and welding equipment. A batch plant would be located onsite for concrete production. Underground piping and electrical installation would begin in areas at or near foundations prior to the foundations being established. Foundations would be established including excavation, formwork, installation of rebar, anchor bolts and embeds, pouring of the concrete, and the concrete finish work.

2.2.4.3.3 Building and Equipment Installation

As foundation work is completed, erection of steel and equipment would begin. This would require the use of multiple cranes and equipment deliveries by trains and trucks.

2.2.4.3.4 Start-up and Commissioning

Upon completion of the major components of the power island, various subsystems would be tested, started up, commissioned, and prepared for operations. Initially, devices and pieces of equipment within a subsystem would undergo testing to verify they are in good condition and ready to be put in service. These tests may include insulation resistance, motor rotation checks, relay calibration, vibration readings, loop testing, functional testing, and instrument calibration. Upon completion of testing, the subsystem would be put into initial operations and closely monitored for any problems. Minor adjustments and subsystem flushes would be performed as necessary during initial operations including cleaning pump screens, checking and adding lubricants, tightening packing glands, etc. The Station would go through an extensive testing and commissioning regimen before becoming commercially operational.

Near the end of project construction, steam would be generated in the boiler and released to the atmosphere to clean the steam piping. This process typically occurs over several weeks and is called "steam blowout." Approximately 30 to 50 steam blowouts, each lasting several minutes, are required for a typical plant before the boiler is operated.

2.2.4.3.5 Site Cleanup and Project Closeout

The final phase of power plant construction would include cleanup of the site, landscaping, completion of miscellaneous tasks, and teardown and removal of temporary construction facilities.

2.2.4.4 Electric Transmission Facilities Construction

The electric transmission facilities would be constructed prior to the startup and commissioning of the Station. Staging areas would be located on the Duck Creek

Substation ROW, Thirtymile Substation ROW, and the power plant site for the placement of materials and equipment to be used during the construction process.

2.2.4.4.1 Transmission Lines

Prior to starting construction, WPEA would survey the ROW and stake the location of the electric transmission facilities. This would include marking tower locations, anchor sites, access roads, batch plant locations, and substation areas. Cultural resource surveys would then be conducted at the tower footprints to identify resources, if any, and resource avoidance plans. Results of cultural resource surveys would be incorporated with the results of other resource surveys (for example, sage-grouse investigations) that have already been conducted to identify resource avoidance areas. These areas would be flagged, signed, or marked in the field prior to beginning work on the ROW or roads in the marked area.

Construction of the electric transmission facilities would require the use of numerous existing access roads to transport materials and equipment to and from the ROW. In addition, new spur roads would need to be constructed along with a new centerline travel route. Establishing access to and along the ROW would be the first construction activity and, in many cases, would occur simultaneously with vegetation removal and trimming. Vegetation removal and trimming procedures would be determined in consultation with the BLM based on specific site conditions and be consistent with BLM requirements on public land.

Batch plants occupying 3 acres each would be located within the transmission line ROW, on the Duck Creek Substation ROW, and on the Thirtymile Substation ROW. The plants would be used to produce concrete for foundations. After the tower locations have been identified and cleared for construction, foundations would be constructed. Assembly of the tower would be completed and the tower placed on its foundation. Helicopters may be used to install towers in areas with rough terrain. The conductor and shield wire would then be placed by installing wire pull ropes, pulling conductors and shield wires with ground-based equipment, sagging and tensioning the conductors and shield wires, and connecting them to the towers. The temporary construction area around each tower is generally expected to be 1 acre. Pulling and tensioning sites of approximately 1.8 acres each would be required at approximately 1.5-mile intervals. After construction, cleanup crews would remove surplus material, equipment, construction debris, etc. from the ROW. Access roads would be maintained or restored following construction in a manner approved by the BLM.

2.2.4.4.2 Substations

Each substation site would be graded and compacted to provide a construction surface for the new equipment. Appropriate drainage features (for example, ditches, culverts) would be installed as necessary. Security fencing would be installed around the perimeter of each substation site. Concrete footings and foundations would be constructed to support the structures and equipment. Conduit and/or a trench system would be installed for electrical control cables. A ground grid would be installed to ensure that all equipment, structures, and fence additions are properly grounded. Gravel would be installed over the substation site.

An air conditioned control building would be installed to house the relay and control panels, AC and DC load centers, a battery bank, and communications equipment. Steel structures would be erected to support switches, electrical bus work, instrument transformers, lightning arrestors, and termination equipment for transmission lines. Oil spill containment basins would be installed around major oil-filled equipment (for example, around transformers). Control cables would be pulled from the panels in the control building to the appropriate equipment through the conduit and/or trench system.

2.2.4.5 Water Supply System Construction

Part of the water supply system would be constructed early in construction to support construction activities. The entire water supply system would be constructed prior to the start-up and commissioning of the Station.

Construction of the water supply system would involve the installation of wells, underground pipeline, aboveground electric distribution lines, buried power feeds to each well, and telecommunication lines to each well. Prior to starting construction, WPEA would survey the ROW and stake the location of the water supply facilities. This would include marking well areas, electric distribution line pole locations, and access roads. Resource avoidance areas, if any, would be flagged, signed, or marked in the field prior to beginning work on the ROW or roads in the marked area. Staging areas would be located on the power plant site and the Staging Area ROW for the placement of materials and equipment during the construction process.

Construction of the water supply system would require the use of existing access roads to transport materials and equipment to and from the ROW. In addition, a new access road would be constructed utilizing overland construction techniques (crush and roll) generally following the centerline of the water supply system linear facilities. Establishing access to and along the ROW would be the first construction activity.

2.2.4.5.1 Wells

After access to the well area has been established and the well area has been cleared, the well would be drilled and cased. The hole for the well vault would be excavated and the vault would be put into place. Once the vault is in place, the electrical equipment and well pump would be installed and the piping connected. Equipment involved would include drilling rigs, excavators, dozers, loaders, and cranes. Mud and test-drilling water associated with and removed during ground water well drilling would be disposed of according to state and federal regulations.

2.2.4.5.2 Water Pipeline

Trenching (open-cut) construction methods would be used for placement of the water pipeline. The water pipeline would be buried to a sufficient depth to be below the frost line. Where crossing a stream, installation would be at a depth well below potential streambed scour, erosion, and exposure. The water pipeline would not cross Duck Creek.

The water pipeline trench would be backfilled with soils removed to install the water pipeline, the original grade of the land restored, and disturbed areas reclaimed according to reclamation BMPs in Appendix A. Equipment used to install the pipeline may include excavators, dozers, loaders, and other vehicles to transport material and equipment.

2.2.4.5.3 Electric Distribution and Communication Lines

After the pole locations have been identified and cleared for construction, holes would be excavated for the placement of the poles. The pole components would be delivered and assembled at each pole site for installation. The pole would be set in the excavated hole and compacted native soil, imported backfill, or concrete would be used to backfill. Guy wires and anchors would be installed at certain pole locations as necessary. The conductor and shield wire would be strung from the poles using wire pull ropes and ground based equipment. The conductor and shield wire would then be tensioned and fastened to the poles with insulators. Communications lines would either be placed underground in the trench with the water pipeline or overhead on the electric distribution lines to provide for remote operation of each well. Wireless communication systems may also be used.

2.2.4.6 Rail Spur Construction

Prior to starting construction, WPEA would survey the ROW and stake the location of the rail spur. Resource avoidance areas, if any, would be flagged, signed, or marked in the field prior to beginning work on the ROW. Access to the Rail Spur ROW would be from the existing NNR or the power plant site.

Initially, the ROW would be cleared and the maintenance/access road and rail bed, including subgrade, culverts, and drainage structures, would be constructed. The rail would be installed, including the placement of ballast, and installation of crossties, rail, and other track material. After construction, cleanup crews would remove surplus material, equipment, construction debris, etc. from the ROW.

Section 2.2.3.4, *Rail Spur ROW,* describes the bridge type that would be used to cross Duck Creek to minimize impacts to wetlands and to maintain creek flows. Section 2.5.6, *Alternative Rail Spurs,* describes the evaluation of alternatives and selection of the preferred rail spur crossing of Duck Creek that would have the least effect on wetlands and wildlife. Section 2.5.7, *Alternative Structure Designs for Crossing Duck Creek,* describes structures evaluated for crossing Duck Creek.

2.2.4.7 Waste Management

Wastes generated during construction activities would be recycled to the extent practical. Any non-recycled wastes would be collected and disposed of at the onsite solid waste disposal facility or transported to a regional licensed landfill, as applicable. Portable toilets would be provided for onsite sewage handling during construction. Sewage would be pumped out and removed regularly and disposed of in compliance with applicable federal and state pollution control regulations.

2.2.4.8 Safety, Fire Protection, and Contingency Planning Contacts

All applicable federal, state, and local safety regulations (for example, the Occupational Safety and Health Administration) would be observed to ensure safety of onsite personnel. Employees and contractors would be required to report all safety-related incidents, including accidents or injuries, to a designated Station representative. Corrective action would be taken as necessary based on the nature of the reported incident.

All applicable federal, state, and local regulations that pertain to prevention and suppression of fires would be strictly adhered to during Station construction. Employees and contractors would be advised of their responsibilities under the applicable fire laws and regulations and be required to report any project-related fire to a designated Station representative. If a project-related fire were to occur, immediate actions would be taken by the contractor to respond to the fire. Contingency planning contacts would include the WPEA construction manager, the BLM authorized officer, and the local fire department.

2.2.5 Operation, Maintenance, and Abandonment

2.2.5.1 Power Plant Operation, Maintenance, and Abandonment

2.2.5.1.1 Operation and Maintenance Overview

The Station would be staffed 24 hours per day, 7 days per week, every day of the year. There would be up to approximately 135 full-time employees. Daily activities would include operation of the equipment to produce electricity, handling of coal, disposal of coal combustion byproducts, and routine maintenance of plant equipment. Water needs during operation (up to 5,000 acre-feet annually) would be supplied through water rights permits for eight wells that are held by White Pine County. Figure 2-4 shows a schematic of the coal-fired electric power production process.

The Station would be operated to serve baseload electric needs, rather than intermediate or peaking electric needs, and would provide approximately 1,590 MW of new baseload coal-fired electric generation capacity. Baseload facilities typically operate near full capacity 24 hours per day. Maintenance outages would be scheduled on occasion to inspect, overhaul, and/or replace major equipment and/or components. These outages are anticipated to last up to 8 weeks and may require deliveries of heavy equipment.

The power plant site would be maintained in a good and proper condition for the commercial life of the Station (expected to be 40 years or longer).

2.2.5.1.2 Access and Traffic

Access to the power plant site would be from U.S. 93 via an existing dirt and gravel road that would be widened and paved. Access roads would be constructed as needed on the power plant site to serve the Station's needs.

Vehicle traffic during power plant operations would include employee vehicles traveling to the site, deliveries to the site, and onsite vehicles handling coal and coal combustion byproducts. In addition, the power plant site would routinely receive coal deliveries via rail, lime deliveries via rail or truck, and chemical deliveries via truck.

2.2.5.1.3 Safety, Fire Control, and Contingency Planning Contacts

Public access to the power plant site would be restricted through the use of fencing and security gates. The site would be equipped with numerous fire suppression systems and WPEA would implement industry-recognized standard procedures to minimize fire risks at the site. Examples include:

- Fire water loop and hydrant system around the perimeter of the power island facilities
- Water storage dedicated for fire water purposes

- Chemical fire suppression systems for designated equipment
- Regular compaction of coal piles
- Routine maintenance and repair of equipment

Various fuels and chemicals would be stored and utilized onsite, including diesel fuel, gasoline, caustics, acids, and ammonia. The power plant site would be designed to include spill-containment dikes and collection systems around chemical storage areas and fuel tanks. Storage and use of chemicals would be in accordance with all applicable federal, state, and local regulations.

2.2.5.1.4 Fencing and Signage

The power plant site would be fenced to restrict public access for safety and security reasons. Signage would be kept to a minimum. During construction, informational signs would mark delivery routes and direct construction traffic. Permanent signage is expected to include a sign along U.S. 93 indicating the name of the Station and signage directing traffic on the power plant site. In addition, posting may be made along the perimeter of the power plant site noting that access to the Station is restricted.

2.2.5.1.5 Abandonment

The Station is anticipated to have a commercial life of 40 years or longer. At the end of its commercial life, decisions would be made regarding continuing to use the power plant site for electric generation purposes or another industrial use. Given that the property would have a significant infrastructure in place (water supply system, rail facilities, electric transmission facilities), WPEA expects that the property would be ideal for continued use as a site for an electric generation facility or for another industrial use.

Upon determination to permanently cease operation of the Station, the power island would be razed with foundations left in place, and the power plant site restored to a condition suitable for future industrial use. Onsite rail, electric transmission, and water facilities would be left in place to support a future use of the property. The solid waste disposal facility would be capped and reclaimed in accordance with applicable regulations and the Station's solid waste permit.

2.2.5.2 Electric Transmission Facilities Operation, Maintenance, and Abandonment

2.2.5.2.1 Operation and Maintenance Overview

The electric transmission lines and electric substations would be operated 24 hours per day, 7 days per week, every day of the year. The electric substations would be visited regularly to perform routine maintenance and ensure they are functioning correctly. Vegetation would be trimmed on an as-needed basis under and along the Transmission Line ROW to minimize potential interference with the transmission lines.

2.2.5.2.2 Access and Traffic

The electric transmission lines would be inspected from the ground or the air on an annual basis. Ground inspections would be conducted generally following the centerline travel route used for construction. This path may also be utilized for required maintenance or repair.

Access to the Duck Creek Substation would be from U.S. 93 over an existing dirt road that would be widened and paved for access to the power plant site. Access to the Thirtymile Substation would be from U.S. 50 over an existing dirt road that would be widened and improved and then a new dirt or gravel road that would extend to the substation site.

2.2.5.2.3 Safety, Fire Control, and Contingency Planning

The electric transmission lines would be designed, constructed, and operated to maintain an acceptable ground level clearance so that people or equipment would not come into contact with the lines. If for some reason an electric line were to contact the ground, a circuit breaker would open and take the line out of service. Repairs would be made as soon as practical to put the line safely back into service.

The electric substations would be fenced to restrict public access. Vegetation would be kept clear from the substation areas to prevent fires from occurring.

2.2.5.2.4 Fencing and Signage

The electric transmission towers/lines would not be fenced. Small signs may be placed at eye level on the towers providing information to the public (emergency contact information, warnings not to climb tower, etc.).

The electric substations would be fenced to restrict access for safety reasons and security. Signage would be minimal and may include a sign stating the substation name and emergency contact information and "no trespassing" postings along the perimeter fencing.

2.2.5.2.5 Abandonment

The electric transmission facilities would become integrated into the electric transmission system that serves Nevada and the Western Electric Coordinating Council. The facilities would be operated and maintained for the foreseeable future. If at some point these facilities were no longer needed as part of the electric system, then the transmission towers and lines would be removed.

2.2.5.3 Water Supply System Operation, Maintenance, and Abandonment

2.2.5.3.1 Operation and Maintenance Overview

Water would be pumped from the eight wells and transported to the power plant site via an underground water supply pipeline system. The water supply system would be operated remotely from a control station at the power plant site. The water supply system is expected to require minimal maintenance activities.

2.2.5.3.2 Access and Traffic

The wells would be accessed via existing roads and new access roads (see Section 2.2.4.5, *Water Supply System Construction*) that would be built within the Water Supply System ROW and along the water pipeline and electric distribution lines. Employees from the Station would visit the wells on occasion to ensure they are in good operating condition and secure.

Permanent access along the length of the underground water supply pipeline, electric distribution lines, and communication lines would be provided by a permanent two-track access road (the same road as used for construction but only 10 feet wide). Some maintenance of this road may be required during wet periods to mitigate muddy driving conditions.

2.2.5.3.3 Safety, Fire Control, and Contingency Planning

The wells would be enclosed to restrict public access to these facilities. The water pipeline would be buried underground and the location would be marked along public roads and other appropriate locations. In the event the water pipeline ruptured, WPEA would isolate that part of the system as soon as possible and make the necessary repairs.

2.2.5.3.4 Fencing and Signage

Each well would be enclosed to restrict access to the well. A sign would be posted at each well, which would provide the well identification and contact information for WPEA. Pipe bollards would be installed above ground around the well vault to prevent vehicular collision with the vault.

The ROW for the water pipeline and electric distribution lines would not be fenced. However, markers would be placed at road crossings and other intervals to mark the location of the underground pipeline and associated facilities.

2.2.5.3.5 Mobile Diesel Generators

For reliability purposes, mobile diesel generators may be available to provide power at times when power cannot be sourced from the Station or through the transmission grid (for example, a fault in the distribution line).

2.2.5.3.6 Abandonment

Wells would be maintained in good working condition throughout the Station's life. If, during the Station's life, one or more wells are unable to reliably yield the needed water, such wells may be retired and capped in accordance with all applicable regulations. At the end of the Station's life, WPEA would convey the water supply system to White Pine County and work with the Nevada State Water Engineer and BLM to complete this process. If for some reason this approach is not viable, then the wells would be capped and abandoned in accordance with all applicable regulations. It is anticipated that the underground water pipeline facilities would be left in place underground if the water supply system were abandoned.

2.2.5.4 Rail Spur Operation, Maintenance, and Abandonment

2.2.5.4.1 Operation and Maintenance Overview

The rail spur would be utilized for deliveries of coal, other materials, and equipment to the power plant site. Coal trains would enter onto the rail spur and continue onto a rail loop at the power plant site. Each train would be entirely off of the NNR prior to commencement of unloading the train. Portions of the train may extend off the power plant site and onto the rail spur during the unloading process.

The rail spur would be operated and maintained in compliance with all federal, state, and local laws and regulations and vegetation would be controlled to minimize fire hazards.

2.2.5.4.2 Access and Traffic

Traffic on the Rail Spur ROW would be limited to train traffic for deliveries to the Station and occasional vehicular traffic to inspect and maintain the rail spur. Assuming normal operations and assuming the power plant is built to approximately 1,590 MW, approximately 12 trains of coal per week would be required to serve the Station.

2.2.5.4.3 Safety, Fire Control, and Contingency Planning

The rail spur would be maintained in good operational condition and vegetation would be controlled near the tracks to minimize fire hazards.

2.2.5.4.4 Signage and Fencing

The rail spur would not be fenced, and there would be limited to no signage.

2.2.5.4.5 Abandonment

At the end of the Station's life, WPEA expects that the rail spur would add value to the power plant site for a future industrial use. However, if at some point in time the rail spur were no longer needed, WPEA expects that the rail tracks would be removed from the rail bed.

2.2.6 Enhancement Measure

The Moriah Ranches Seeding Project would restore an existing seeding on public land in BLM's Ely District to better ecological condition and increase forage for livestock and cover for wildlife. The project would be designed to create a habitat mosaic that provides cover for sage-grouse and antelope. The project would be located on public land 16 miles north of McGill and immediately west of U.S. 93. The loss of habitat under both the Proposed Action would be partially offset by the 700- to 900-acre Moriah Ranches Seeding Project.

The original seeding occurred in 1969 on 770 acres consisting of various soil types using crested wheatgrass. The site is fenced and has been used for spring and late fall grazing (May 1 to June 15 and November 1 to November 30). Because of drought and other factors, this location has not been grazed for the past 4 years.

Islands of Wyoming big sagebrush cover would be identified for non-disturbance in the Yody-Dewar soil type. The remainder of the vegetation in this soil type would be mechanically treated to restore the understory component of the habitat. The proposed seed mix would include crested wheatgrass, Indian ricegrass, forage kochia (*Kochia prostrata*) (a desirable species as opposed to American kochia [*Kochia scoparia*], an invasive weed), globemallow, and phlox. A sterile annual rye, Ladac alfalfa, or sweet clover would be added to the mix to compete with halogeton until the more desirable seed mix species become established. Seed application would be at 8 to 10 pounds per acre. No more than 1,000 acres would be treated. It is estimated that the total area to be treated would be between 700 and 900 acres.

Treatment would occur in late fall or winter. No seeding or disturbance is anticipated for either the Kunzler-Pern or Hessing-Tulase soil types because of their sodic characteristics. A buffer zone would be established between the Yody-Dewar association and the Kunzler-Pern and Hessing-Tulase association types.

2.2.7 Best Management Practices

Activities under the Proposed Action would consist of two sets of actions that are a specifically directed and integral part of the Proposed Action. The first set of actions would be to comply with the terms and conditions of all ROWs issued by the BLM. The second set of actions would be to follow BMPs typically associated with the construction, operation, and maintenance of power plants, wellfields, pipelines, electric transmission facilities, railroad spurs, and other related facilities in this region of the western United States. These BMPs would be followed to avoid or minimize the potential for adverse environmental effects resulting from project-related activities.

Appendix A, *Best Management Practices*, describes BMPs for the following activities:

- Air pollution prevention
- Landscape preservation and impact avoidance
- Erosion and sediment control
- Pipeline and utility corridor construction
- Biological resources
- Cultural resources
- Reclamation (site restoration, revegetation, and noxious weed control)
- Visual resources

- Water pollution prevention and monitoring
- Noise prevention
- Hazardous material storage, handling, and disposal, and safety measures

The Construction, Operation, and Maintenance Plan will detail the methods and procedures to be used in the construction of the power plant, electric transmission facilities, water supply system, rail spur, access roads, and ancillary facilities. The Construction, Operation, and Maintenance Plan will incorporate site-specific stipulations, terms, and conditions in order to satisfy all Station-related construction requirements, as well as operational, maintenance, and abandonment/restoration requirements associated with lands administered by the Ely Field Office of the BLM where Station features would be located.

Mitigation measures specific to various resources present in the Station area are described in Chapter 4, *Environmental Consequences*.

2.3 Alternative 1

2.3.1 Description of BLM Actions

BLM actions that would occur under Alternative 1 include issuing ROWs necessary for the construction and operation of the Station. The ROW issued by the BLM for the construction and operation of the power plant under Alternative 1 would be for an alternative location. ROWs for the rail spur, water supply system, and portions of the access roads and electric transmission facilities also would have alternative locations. Subsequent to the issuance of ROWs, arrangements would be made for the sale of the Power Plant ROW to WPEA. Rationale presented in Section 2.2.1.2 for the direct sale of the Proposed Action Power Plant ROW to WPEA also applies to the Alternative 1 Power Plant ROW.

2.3.2 Description of Station Area

Figure 2-17 depicts the Power Plant ROW and locations of prominent Station features associated with Alternative 1. The Power Plant ROW would be located entirely in White Pine County, approximately 38 miles south of the White Pine County/Elko County line and approximately 40 miles west of the Nevada/Utah border. Prominent landmarks in the area of the Power Plant ROW include U.S. 93 and the Schell Creek Range to the east, Duck Creek and the Egan Range to the west, and Goshute Lake to the north. The communities of McGill and Ely are approximately 10 and 22 miles south of the Power Plant ROW, respectively, and Great Basin National Park is approximately 50 miles to the southeast.

The Station would primarily be located in the Steptoe Valley Hydrographic Basin. The electric transmission facilities would extend beyond the Steptoe Valley Hydrographic Basin into the Butte Valley and Jakes Valley Hydrographic Basins. Duck Creek is the primary drainage in Steptoe Valley near the Power Plant ROW. The creek receives runoff from the western flank of the Schell Creek Range and the eastern flank of the Egan Range and flows north toward Goshute Lake.

2.3.3 Description of Project Features and ROWs

Project features and ROWs associated with Alternative 1 for the Station are described in the following text. ROWs that would be needed for the Station include the Power Plant ROW, Electric Transmission Facilities ROW, Water Supply System ROW, Rail Spur ROW, Access Road ROW, and Additional

Construction ROW (Electric Distribution Line and Mineral Materials Sale).

Table 2-3 summarizes the estimated acres that would be needed for each ROW and whether the ROWs would be temporary (construction only) or permanent (construction plus the life of the Station). Table 2-3 also summarizes the estimated acres of construction-related and permanent (during operations) land disturbances that would result from the construction and operation of the Station as well as acres of lands that would be reclaimed.

Alternative 1 would require approximately 2,605 acres of ROWs, including 2,519 acres of permanent ROWs for the life of the Station and 86 acres of temporary, construction ROWs (Table 2-3). Subsequent to the issuance of ROWs, arrangements would be made for the sale of the 1,330-acre Power Plant ROW to WPEA. This sale would reduce the amount of permanent ROWs needed to 1,189 acres. Table 2-3 also shows estimated acres of temporary and permanent disturbed areas and acres reclaimed for Alternative 1.

2.3.3.1 Power Plant ROW

The equipment and operations to be located on the Power Plant ROW would be the same as described for the Proposed Action. They would include the power island; coal unloading, handling, and storage facilities; a solid waste disposal facility for coal combustion byproducts; and an evaporation pond. The preliminary site plan for the Alternative 1 Power Plant ROW, shown in Figure 2-18, would differ from that of the Proposed Action because of differences in land ownership configuration at the two sites. However, the conceptual rendering of the Station shown in Figure 2-3 and the schematic of the proposed power production process shown in Figure 2-4 are the same for Alternative 1 as the Proposed Action.

Approximately 1,330 acres would be required for the Power Plant ROW (Table 2-3). Construction and operation of the Station would result in the permanent disturbance of the entire Power Plant ROW for a total of approximately 1,330 acres (Table 2-3). The Power Plant ROW would be located within Sections 28, 29, 32, and 33, Township 20 North, Range 64 East in White Pine County.

2.3.3.2 Electric Transmission Facilities ROW

The electric transmission facilities would consist of overhead 500-kV and 345-kV electric transmission lines and two electric substations (see Figure 2-18). The permanent ROW needed for the electric transmission facilities would total approximately 1,116 acres (see Table 2-3) and include the following:

- Approximately 60-acre electric Duck Creek Substation
- Approximately 77-acre electric Thirtymile Substation
- Approximately 28 mile-long, 200-foot-wide corridor (685 acres) for one 500-kV transmission line from the Duck Creek Substation to the Thirtymile Substation
- Two approximately 0.2 mile-long, 160-foot-wide ROWs (9 acres) for two 345-kV transmission lines to interconnect the Falcon-Gonder 345-kV transmission line to the Thirtymile Substation
- Two approximately 6 mile-long, 200-foot-wide ROWs (285 acres) for two 500-kV transmission lines to interconnect the planned SWIP 500-kV transmission line to the Duck Creek Substation

TABLE 2-3

Estimated Acres of ROWs and Disturbed and Reclaimed Areas for Alternative 1

	ROWs		Disturbed and Reclaimed Areas		
	Temporary (acres)[a]	Permanent (acres)[b]	Construction[a] (acres)	Reclaimed (acres)	Permanent[c] (acres)
Power Plant ROW/Power Plant Site	0	1,330	1,330	0	1,330
Electric Transmission Facilities ROW					
Duck Creek Substation ROW	0	60	60	0	60
Thirtymile Substation ROW	0	77	77	0	77
Duck Creek to Thirtymile 500-kV Line ROW	0	685	222	176	46
Falcon-Gonder 345-kV Interconnection ROW	0	9	8	7	1
SWIP 500 kV Interconnection ROW	0	285	90	76	14
Water Supply System ROW					
Linear Facilities ROW (30-foot-wide temporary)	29	0	29	29	0
Linear Facilities ROW (40-foot-wide permanent)	0	39	39	29	10
Ground Water Well ROW (8 wells)	0	4	4	3	1
Construction Staging Area ROW	2	0	2	2	0
Rail Spur ROW					
Temporary ROW (30-foot-wide)	10	0	10	10	0
Permanent ROW (35- to 70-foot-wide)	0	24	24	0	24
Access ROW					
Power Plant ROW Access	0	3	3	0	3
Duck Creek Substation ROW Access	0	1	1	0	1
Thirtymile Substation ROW Access	0	2	2	0	2
Additional Construction ROW					
Electric Distribution Line-----	5	0	5	5	0
Mineral Materials Sale Area (Offsite Borrow Area)	40	0	40	40	0
Total	**86**	**2,519**	**1,946**	**377**	**1,569**

[a] Construction
[b] Construction plus life of Station
[c] Operations

Preliminary Site Layout
Alternative 1
White Pine Energy Station Project

Figure 2-18

2.3.3.2.1 Duck Creek Substation ROW

The Duck Creek Substation would be located adjacent to and immediately northeast of the power plant site on approximately 60 acres (see Figures 2-17 and 2-18 and Table 2-3). Substation facilities would be the same as described for the Proposed Action.

2.3.3.2.2 Thirtymile Substation ROW

The Thirtymile Substation would be the same as described for the Proposed Action.

2.3.3.2.3 Duck Creek to Thirtymile 500 kV Transmission Line ROW

One 200-foot-wide transmission line ROW would extend from the Duck Creek Substation approximately 28 miles west to the Thirtymile Substation near Robinson Summit (see Figure 2-17). The types of transmission towers utilized would be the same as the Proposed Action. It is estimated that there would be approximately 17 miles of transmission line utilizing H-frame towers, approximately 10 miles of transmission line utilizing single-circuit self-supporting lattice towers, and approximately 1 mile of transmission line utilizing double-circuit self-supporting lattice towers.

The height and spacing between each tower would be similar to the Proposed Action. It is estimated that there would be approximately 71 H-frame towers, approximately 43 single-circuit self-supporting lattice towers, and approximately 6 double circuit self-supporting lattice towers.

The areas of disturbance associated with each tower, pulling and tensioning sites, batch plant, and spur roads and tangential roads would be similar to the Proposed Action. It is estimated that approximately 12 miles of existing roads would need to be upgraded and approximately 32 miles of new roads would have to be constructed.

2.3.3.2.4 Falcon-Gonder 345-kV Interconnection ROW

The Falcon-Gonder 345-kV Interconnection would be the same as described for the Proposed Action.

2.3.3.2.5 SWIP 500-kV Interconnection ROW

Two separate 200-foot-wide transmission line ROWs would extend from the Duck Creek Substation approximately 6 miles northwest to the planned SWIP transmission line (see Figures 2-17 and 2-18). The planned SWIP 500-kV transmission line would be looped into the Duck Creek Substation and new transmission towers would be erected to connect each segment into the 500-kV equipment at the Duck Creek Substation. The towers would be steel pole H-frame and dead end structures as required. It is estimated that approximately 50 towers would be used, 10 pulling and tensioning sites would be required, and access roads along each transmission line ROW would be required for construction access and long term maintenance.

2.3.3.3 Water Supply System ROW

The water requirements for the Station would be the same as the Proposed Action. The location of the well field for Alternative 1 is shown in Figure 2-17 and is different from the well field for the Proposed Action. A water supply system would be constructed to supply water to the Station. The water supply system would require approximately 43 acres of permanent ROW and approximately 31 acres of temporary ROW (Table 2-3) and include the following:

- Eight approximately 0.5-acre ROWs for each ground water well
- Approximately 8-mile-long, 40-foot-wide permanent ROW (39 acres) and 30-foot-wide temporary ROW

(29 acres) for underground water pipelines, electric distribution lines, communications lines, access roads, and other facilities as necessary

- Approximately 2-acre temporary ROW as a staging area for the placement of materials and equipment during construction

Ground Water Well ROW

The Station would use up to eight ground water wells for water supply. Construction and operation of the ground water wells would occupy approximately 0.2 acre total. The wells would be approximately 1,000 feet deep and withdraw water from the basin-fill aquifer.

Each well is permitted to withdraw up to 3 cubic feet per second of water. The location for the ground water wells associated with the water supply system is constrained by defined well locations as specified under permits issued to White Pine County by the Nevada State Engineer's Office. Figure 2-17 depicts the locations where the eight water wells would be drilled.

The description of the wells would be the same as for the Proposed Action.

2.3.3.3.1 Water Supply System Linear Facilities ROW

One 40-foot-wide permanent ROW and one 30-foot-wide temporary ROW would extend from the power plant site approximately 8 miles generally west and south to each of the ground water wells (see Figure 2-17). The description of the water supply system linear facilities would be the same as for the Proposed Action except the permanent disturbance associated with the access roads is estimated to be approximately 10 acres for Alternative 1.

2.3.3.3.2 Construction Staging Area ROW

A temporary ROW would be utilized during the construction of the water supply system as a staging area for the placement of materials and equipment (see Figure 2-17). This ROW would be approximately 100 feet wide by 871 feet long.

2.3.3.4 Rail Spur

A rail spur approximately 3 miles long would be constructed from the existing NNR to a rail loop that would be constructed on the power plant site (see Figure 2-17). The rail spur would generally run east-west and enter the power plant site near its southwest corner. The rail spur would include all facilities necessary for the operation of the railroad including rail, cross ties, other track material, ballast, drainage facilities, and access roads.

A temporary 30-foot-wide ROW located adjacent to the permanent rail spur ROW would be required during construction. The temporary ROW would occupy approximately 10 acres and be reclaimed after construction is complete. The permanent rail spur ROW would be 35 to 70 feet wide and occupy approximately 24 acres. The rail spur would cross several small drainages to Duck Creek, but it would not cross mainstream Duck Creek.

2.3.3.5 Access ROW

Access ROWs would be required to provide road access and certain utility access (for example, phone and fiber optics) to the Power Plant ROW, Duck Creek Substation, and Thirtymile Substation.

2.3.3.5.1 Power Plant ROW Access

The ROW for access to the power plant site would be 60 feet wide. The ROW would begin at U.S. 93 and continue directly west to the power plant site (see

Figure 2-17). This ROW would be approximately 0.3 mile long and cover approximately 3 acres.

2.3.3.5.2 Duck Creek Substation ROW Access

The ROW for access to the Duck Creek Substation would be 30 feet wide. The ROW for the Duck Creek Substation would begin at U.S. 93 and continue directly west to the Duck Creek Substation ROW (see Figure 2-17). This ROW would be approximately 0.4 mile long and cover approximately 1 acre.

2.3.3.5.3 Thirtymile Substation ROW Access

The ROW for access to the Thirtymile Substation would be the same as the Proposed Action.

2.3.3.6 Additional Construction ROW

Offsite activities would be necessary to support construction of the Station, including the need for construction power and additional earth and rock materials.

2.3.3.6.1 Electric Distribution Line

A temporary ROW would be utilized to provide power during the construction of the Station. The temporary ROW for construction power from the existing 69-kV distribution line to the power plant site would be 40 feet wide.

The electric distribution line would be constructed from the existing distribution line, located approximately 0.7 mile east of U.S. 93, to the power plant site along the northern side of the Power Plant ROW access (see Figure 2-17). This ROW would be approximately 1 mile long, resulting in a temporary ROW grant of approximately 5 acres.

2.3.3.6.2 Mineral Materials Sale Area

This area would be the same as the Proposed Action.

2.3.3.7 Connected Actions

The two third-party infrastructure projects described for the Proposed Action (NNR upgrade and operation and SWIP construction) also are closely related to but not part of Alternative 1.

Under Alternative 1, the rail spur for the proposed White Pine Energy Station power plant would connect to the upgraded NNR at approximately MP 115. The portion of the NNR south of the Alternative 1 rail spur is not considered part of the connected action because Station-related coal trains will not travel further south than the Alternative 1 rail spur.

Between the Proposed Action and Alternative 1 rail spur sites, 6 corrugated metal pipe culverts and 1 concrete box culvert would need replaced or repaired, 4 rail/road crossings would need reconstructed, and 1 siding should be replaced with heavier rail.

2.3.4 Construction Activities

Construction activities associated with Alternative 1 would be the same as those described for the Proposed Action in Section 2.2.4, *Construction Activities*.

2.3.5 Operation, Maintenance, and Abandonment

Operation, maintenance, and abandonment activities associated with Alternative 1 would be the same as those described for the Proposed Action in Section 2.2.5, *Operation, Maintenance, and Abandonment.*

2.3.6 Enhancement Measure

An enhancement measure associated with Alternative 1 would consist of the Moriah Ranches Seeding Project and would be the same as described for the Proposed Action in Section 2.2.6, *Enhancement Measure.*

2.3.7 Best Management Practices

BMPs associated with Alternative 1 would be the same as described for the Proposed Action in Section 2.2.7, *Best Management Practices* and contained in Appendix A, *Best Management Practices*. Mitigation measures specific to Alternative 1 for the various resources present in the Station area are described in Chapter 4, *Environmental Consequences*.

2.4 No Action Alternative

Section 1502.14(d) of NEPA regulations requires that the alternatives analysis in an EIS include a No Action Alternative. Under the No Action Alternative for this *DEIS for the White Pine Energy Station Project,* Station-related ROWs would not be created, the Power Plant ROW subsequently would not be sold to WPEA, and the power plant and related facilities would not be constructed or operated as described for the Proposed Action or Alternative 1. However, it is assumed that the NNR and SWIP connected actions would be implemented.

If the No Action Alternative is selected for implementation, existing conditions and trends that are described for the affected environment in *Chapter 3, Affected Environment*, of this document would continue. As a result, the project purposes and needs that were described in Section 1.2, *Purpose, Need, and Background,* would not be met.

2.5 Alternatives Considered but Eliminated from Further Consideration

This section describes alternatives that were considered in developing the Proposed Action, but which were rejected from further consideration, and the reasons for their rejection.

2.5.1 Alternative Power Generating Technologies

Alternative power generating technologies that were considered but eliminated from further consideration because they would not meet project purpose and need are described in the following text, together with the rationale for their elimination. To inform the reader, the power generating technology selected for the Station (pulverized coal power plant) also is described in the following text (see Section 2.5.1.4.4) for purposes of comparison to those alternatives that were eliminated.

Categories of technologies considered include renewable non-combustible energy resources (for example, wind, solar); renewable combustible energy resources (for example, biomass, biogas); non-renewable combustible energy resources (for example, natural gas, various coal processes); and other (nuclear and conservation/energy efficiency). The following six key criteria were developed to evaluate the technical and economic feasibility, environmental soundness, and ability of the alternative energy technologies to meet project purpose and need, which were described in detail in Section 1.2, *Purpose, Need, and Background:*

- Capable of providing approximately 1,590 MW of reliable baseload power generation capacity
- Environmentally permittable
- Cost effectiveness relative to pulverized coal
- Commercially proven and reliable
- Place water held by White Pine County for power production in

Steptoe Valley to beneficial use for power production

- Provide traffic for the NNR

Table 2-4 summarizes and compares results of the evaluation of alternative power generation technologies for meeting the purpose and need criteria for the proposed project. All six criteria are discussed in the following text and compared among the alternative technologies in Table 2-4. As indicated in the following discussion and Table 2-4, only the pulverized coal and the circulating fluidized-bed (CFB) coal power plant technologies would meet all six of the evaluation criteria and project purpose and need. However, CFB does require a higher capital cost and offers no technical, operating economics, or environmental advantages over pulverized coal.

Information on alternative power generating technologies presented in Section 2.5.1 has been summarized from a detailed study by CH2M HILL (2004). That study described, evaluated, and compared various aspects of energy alternatives, including estimated power costs. Power cost estimates presented in the CH2M HILL (2004) study are approximate order of magnitude values and are suitable for comparing the relative cost effectiveness of power generating technologies evaluated for the Station in the following text.

2.5.1.1 Renewable Non-Combustible Energy Resources

The renewable non-combustible energy resources evaluated in this section are wind, hydroelectric, solar, and geothermal.

2.5.1.1.1 Wind

The greatest advantage of wind power is its potential for large-scale, though intermittent, electricity generation without emissions of any kind. In addition, over the years, wind energy's production cost has benefited from improvements in technology and increased reliability.

The development of wind power is increasing in many regions of the United States. Technological advances have improved the performance of wind turbines and driven down their cost. In locations where the wind blows steadily, wind power has been shown to compete favorably with coal and natural gas fired power plants based on receiving the federal Renewable Energy Production Incentive.

The outlook for wind energy remains favorable because of the technology's economic competitiveness, growing demand for electricity, and effective renewable energy policies adopted in several markets.

Wind turbines are mounted on a tower to capture the most energy. At 100 feet (30 meters) or more aboveground, they can take advantage of the faster and less turbulent wind. Turbines catch the wind's energy with their propeller-like blades. Usually, two or three blades are mounted on a shaft to form a rotor.

Wind turbines can be used in off-grid applications, or they can be connected to a utility power grid. For utility-scale sources of wind energy, a large number of turbines are usually built close together to form a wind farm. These turbines each require about a quarter-acre of land, which includes land for the turbine and any access roads. As a result, turbines fit well onto agricultural land without taking the land out of production, simply making way for the turbine's base. All of the land in between the turbines is available for agricultural activities.

TABLE 2-4

Comparison of Alternative Power Generating Technologies

	Capable of Meeting Purpose and Need Criteria						
	Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity	**Environmentally Permittable**	**Cost Effectiveness Relative to Pulverized Coal**	**Commercially Proven and Reliable**	**Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production**	**Provide Traffic for the NNR**	**Capable of Meeting Purpose and Need**
Renewable Non-combustible Energy Resources							
Wind	No	Yes	Yes	Yes	No	No	No
Solar	No	Yes	No	No	No	No	No
Hydroelectric	No	Difficult	Yes	Yes	No	No	No
Geothermal	No	Yes	No	No	No	No	No
Renewable Combustible Energy Resources							
Biomass	No	Yes	No	Yes	Unlikely but possible	Yes	No
Biogas	No	Yes	Yes	Yes	Unlikely but possible	No	No
Municipal Solid Waste (MSW)	No	Difficult	No	Yes	Unlikely but possible	Yes	No
Nuclear	Yes	Difficult	Yes	Yes	Yes	No	No
Non-renewable Combustible Energy Resources							
Natural Gas Combined Cycle (NGCC)	Yes	Yes	No	Yes	Yes	No	No
Circulating Fluidized-Bed (CFB) Coal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Integrated Gasification Combined Cycle (IGCC) Coal	No	Yes	No	No	Yes	Yes	No
Pulverized Coal (selected for the proposed White Pine Energy Station)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

The greatest advantage of wind power is its potential for large-scale, though intermittent, electricity generation without emissions of any kind. Nevada has excellent wind resources in portions of the state. However, because of the intermittent nature of wind, estimates of capacity factors range from only 25 to 35 percent. Another major issue regarding wind intermittence is that wind power can offer energy, but not on-demand capacity. Therefore, wind power cannot always be reliably dispatched at the time it is needed and cannot be considered for baseload operation.

Environmentally Permittable

While wind power has no air emissions or water use, it does have other impacts on the environment. These include visual obstruction, bird kills, and noise pollution, among others. Mitigation measures are frequently taken to resolve these problems. This technology should be permittable in Nevada.

Cost Effectiveness Relative to Pulverized Coal

Within the limits of its intermittent nature, the cost of power generated by large wind turbine farms is competitive with power generated from a pulverized coal plant, based on the current energy tax incentives provided by the federal government. The total levelized cost to construct, operate, and maintain a wind power plant over its economic life converted to equal annual payments is approximately $47 per MWh (megawatt-hour) for the life of the project compared to approximately $50 per MWh for a pulverized coal plant.

Commercially Proven and Reliable

Wind power is commercially proven and reliable. Installed wind electric generating capacity now exceeds 6,000 MW in the United States, 28,000 MW in Europe, and 39,000 MW worldwide.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A wind power project would not place the use of water held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a wind power project would be expected to provide little, if any, traffic for the NNR.

Capable of Meeting Purpose and Need

Wind power is cost effective, within the limits of its intermittent nature, with tax incentives provided by the federal government. Wind power should be environmentally permittable in Nevada. However, because of its intermittent nature, wind power cannot offer high reliability consistently and it cannot offer baseload operation. Wind power would not result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, and it would provide little, if any, traffic for the NNR. Therefore, wind power does not meet most of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.1.2 Solar

The sun is a direct source of energy. Using renewable energy technologies can convert solar energy into electricity. However, solar energy varies by location and time of year. Solar resources are expressed in watt-hours per square meter per day. This is roughly a measure of how much energy falls on a square yard over the course of an average day.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

Because of the intermittent nature of solar power, estimates of capacity factors range from only 20 to 35 percent. Another major issue regarding solar power intermittence is that solar power can offer energy, but not on-demand capacity. Related to intermittence is solar power's unpredictable nature because of weather. Therefore, solar power cannot always be reliably dispatched at the time it is needed and cannot be considered for baseload operation.

Environmentally Permittable

In general, solar resources have relatively less impact on the environment compared to other generation technologies, except possibly for aesthetics and the large area required for the facilities. As an example of a solar facility's size, CH2M HILL (2004) reported that the footprint of a 300 MW solar farm would encompass approximately 4,200 acres. By extrapolation, the footprint of a solar facility capable of providing approximately 1,590 MW of power, the same as the proposed Station, would exceed 20,000 acres. No major direct air emissions are related to the installation of a solar facility, and there would be no major water discharge issues. This technology should be permittable in Nevada.

Cost Effectiveness Relative to Pulverized Coal

The cost of power generated by solar facilities is three to four times greater than power generated from a pulverized coal plant. The total levelized cost to construct, operate, and maintain a solar facility over its economic life converted to equal annual payments ranges from approximately $157 per MWh for photovoltaic solar power to $168 per MWh for solar thermal power.

Commercially Proven and Reliable

Solar concentrators and flat-plate collector types are both used in each of the solar-based technologies—photovoltaic and solar thermal.

The largest use of photovoltaic has been in the off-grid market, which takes advantage of photovoltaic's ability to be a complete stand-alone electrical system. Telecommunications and transportation construction signage are the two largest segments of the off-grid market. Most of the off-grid market is associated with remote locations and inaccessibility to the utility grid of applications, such as water pumping and highway lighting. However, in many instances, the grid may be near a well developed area, but it is still more cost-effective to install a modular photovoltaic system rather than cross roadways or sidewalks.

In the southwestern United States, solar thermal power is being considered primarily as an important technology resource. California, Nevada, Arizona, and New Mexico are each exploring policies that would further the development of their solar-based industries.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A solar facility would not place the use of water held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a solar facility would be expected to provide little, if any, traffic for the NNR.

Capable of Meeting Purpose and Need

Photovoltaic solar power can offer high reliability but solar thermal power cannot. Both types of solar power cannot offer baseload operation, are not considered cost effective, and require large land areas compared to a pulverized coal plant. Solar power would not result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, and it would provide little, if any, traffic for the NNR. Therefore, solar power does not meet most of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.1.3 Hydroelectric

Flowing water creates energy that can be captured and turned into electricity. This is called hydroelectric power or hydropower.

The most common type of hydroelectric power plant uses a dam on a river to store water in a reservoir or a run of the river approach, which does not result in the construction of a large reservoir. Water released from the reservoir flows through a turbine, which in turn activates a generator to produce electricity.

Another type of hydroelectric power plant, referred to as a pumped storage plant, has the capacity to store energy. The power is sent from a power grid into the electric generators. The generators then turn the turbines backward, which causes the turbines to pump water from a river or lower reservoir to an upper reservoir, where the energy is stored. To use the energy, the water is released from the upper reservoir back down into the river or lower reservoir. This turns the turbines forward, activating the generators to produce electricity.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

Beyond Hoover Dam, no other sites in Nevada are available for a large-scale hydroelectric project, like an approximately 1,590-MW plant. Therefore, hydroelectric power cannot be considered for baseload operation.

Environmentally Permittable

Environmental impacts would vary depending on the type and number of hydroelectric projects proposed: run of river, reservoir storage, or pumped storage. While there would be no major water discharge issues compared with typical thermal power plants, the construction of an impoundment or reservoir could have various adverse impacts on water quality, wetlands, flooding of uplands, and aquatic as well as terrestrial biota. The permitting of a new hydroelectric facility is typically a complex and time-consuming process requiring multiple federal and state permits and approvals. Development of a hydroelectric facility can experience significant public and agency opposition.

Cost Effectiveness Relative to Pulverized Coal

The cost of power generated by a large hydroelectric project would be approximately half that of power generated from a pulverized coal plant. The total levelized cost to construct, operate, and maintain a hydroelectric project over its economic life converted to equal annual payments is approximately $24 per MWh.

Commercially Proven and Reliable

Hydroelectric power is commercially proven and reliable and is responsible for a significant portion of the generation capacity in various regions of the United States and abroad. However, as noted previously, because of the seasonal nature of hydropower, the average annual capacity factor for most facilities is approximately only 30 to 40 percent.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A hydroelectric project would not place the use of water (ground water rights) held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a hydroelectric facility would be expected to provide little, if any, traffic for the NNR.

Capable of Meeting Purpose and Need

Hydroelectric power cannot fulfill the need for approximately 1,590 MW of highly reliable baseload capacity because no such sites exist in Nevada beyond Hoover Dam. Although cost effective once in operation, development of a hydroelectric facility can experience significant public and agency opposition and be difficult to permit environmentally. A hydroelectric project would not result in the beneficial use of ground water held by White Pine County for power production in Steptoe Valley, and it would provide little, if any, traffic for the NNR. Therefore, hydroelectric power does not meet most of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.1.4 Geothermal

Geothermal energy is contained in underground reservoirs of steam, hot water, and hot dry rocks. Electric generating facilities use hot water or steam extracted from geothermal reservoirs in the earth's crust to drive steam turbine generators to produce electricity. Moderate-to-low temperature geothermal resources are used for direct-use applications such as district and space heating. Lower temperature, shallow ground, geothermal resources are used by geothermal heat pumps to heat and cool buildings. Hence, the only geothermal resources that may be considered for use in generating power are the high temperature sources. Nevada has high-temperature resources that are suitable for electricity generation.

The time from which a site is confirmed as having sufficient water or steam at temperatures high enough to drive turbines using either a binary or flash system to the time a facility can produce electricity is typically less than 3 years. However, because of the remote locations of many geothermal resources, the cost of transmission may make the venture more expensive than a facility that is closer to an identified injection point.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

Geothermal energy consists of a dispersed resource base and is not available in sufficient capacity in White Pine County to meet the project purpose and need. Therefore, geothermal power cannot be considered for baseload operation.

Environmentally Permittable

Geothermal energy is generally one of the cleaner forms of energy available for commercial applications. Large geothermal resources used for electrical generation have had issues with air emissions (primarily hydrogen sulfide) and water discharges and would need additional controls to minimize emissions. The high flow rates of steam and water from geothermal wells can result in the precipitation of various compounds, primarily silica. Land disposal of precipitates would be required. This technology should be permittable in Nevada.

Cost Effectiveness Relative to Pulverized Coal

The cost of power generated by geothermal projects would typically be higher than power generated from a pulverized coal plant. The total levelized cost for a geothermal power project over its economic life converted to equal annual payments ranges from approximately $50 to $80 per MWh.

Commercially Proven and Reliable

Producing electricity from geothermal resources involves a mature technology. About 8,000 MW of geothermal electricity are currently produced around the world, including about 2,200 MW of capacity in the United States. All of the geothermal power in the United States is generated in California, Nevada, Utah, and Hawaii, with California accounting for over 90 percent of installed capacity. A considerable amount of the power (1,137 MW) is generated at The Geysers in northern California. The Geysers is a fairly unusual (and ideal) resource because its wells produce virtually pure steam with no water.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A geothermal project would not place the use of water (non-thermal ground water rights) held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a geothermal facility would be expected to provide little, if any, industrial or demand-related traffic for the NNR.

Capable of Meeting Purpose and Need

Geothermal power is not available in White Pine County in sufficient capacity to meet project purpose and need. Although environmentally permittable, geothermal power typically has a higher cost than power from a pulverized coal plant. A geothermal power project would not result in the beneficial use of water (non-thermal ground water rights) held by White Pine County for power production in Steptoe Valley, and it would provide little, if any, traffic for the NNR. Therefore, geothermal power does not meet most of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.2 Renewable Combustible Energy Resources

The renewable combustible energy resources evaluated in this section are biomass, biogas, and municipal solid waste.

2.5.1.2.1 Biomass

For heating applications or electricity generation, biomass can be directly burned in its solid form, or first converted into liquid or gaseous fuels by thermal decomposition. Biomass power technologies convert renewable biomass fuels into heat and electricity using modern boilers, gasifiers, turbines, generators, fuel cells, and other methods.

Forest fires in the past several years in western states have generated increased stimulus to initiate forest thinning programs. Several biomass plants are being proposed in the West to use forest thinnings as a major fuel source.

In addition to the potential for traditional forest product companies to participate in electric generation, the degree of success that nontraditional participants in the national fiber market will experience must be evaluated. The principal nontraditional participant would likely be an electric utility considering co-firing biomass with coal. Scenarios for large increases in biomass-based power generation usually assume that some fraction of this electricity will come from co-firing. About 15 percent of a co-firing fuel mix can be biomass in theory. In practice, however, workable proportions may be closer to 5 percent. At the utility sector level, this scenario might imply that a big increase in biomass electricity encompasses participation by many buyers making relatively small, scheduled fiber purchases.

The viability of the utility co-firing scenario, at first glimpse, does not appear favorable. Forest product industries are usually located near timber resources. In contrast, utility generating facilities are located according to a number of considerations: water availability, land acquisition capability and costs, environmental and safety issues, transmission and distribution costs, and proximity to population centers, among others. These considerations often do not put utility plants within an economically feasible range (generally 50 miles) of biomass resources; the amount of wood required to satisfy only 5 percent of fuel requirements is far too small to transport wood in a manner similar to that of coal. Thus, some utilities that might wish to co-fire with wood are faced with difficulties accessing fuel resources in a cost-effective manner.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

Recent studies indicate that Nevada has a fair biomass resource potential (DOE, 2007). These studies are based on estimates for five general categories of biomass: urban residues, mill residues, forest residues, agricultural residues, and energy crops. However, it is unknown whether enough biomass would be available within or near White Pine County to fuel approximately 1,590 MW of baseload power generation.

Environmentally Permittable

This technology should be permittable in Nevada.

Cost Effectiveness Relative to Pulverized Coal

The cost to generate electricity from biomass varies depending on the type of technology used, size of the power plant, and cost of the biomass fuel supply; however, it is typically significantly higher than generating power from a pulverized coal plant. The total levelized cost for a direct-fired biomass power plant over its economic life converted to equal annual payments is approximately $90 per MWh compared to $50 per MWh for a pulverized coal plant.

Most forest residues, agricultural residues, and energy crops are not presently economic for energy use. New tax credits or incentives, increased monetary valuation of environmental benefits, or sustained high prices for fossil fuels could make these fuel sources more economic in the future. Currently, the most economically attractive technology for biomass is co-firing. Co-firing systems range in size from 1 MW to 30 MW of biopower capacity.

For biomass to be economical as a fuel for electricity, the source of biomass must be located near to where it is used for power generation. This reduces transportation costs—the preferred system has transportation distances less than 100 miles. The most economical conditions exist when the energy use is located at the site where biomass residues are generated (that is, at a paper mill or sawmill).

Commercially Proven and Reliable

Generating electricity from biomass residues is a proven and commercially available technology. Although many people envision substantial increases in biomass power for the future with "energy crop" plantations forming a primary supply base, this is not commercially feasible or reliable in the near term. Presently, "closed-loop" (that is, sustainably supplied) biomass power projects are at the research and demonstration phase.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A biomass project in White Pine County could place the use of water held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a biomass plant would be expected to provide little traffic for the NNR except for the conveyance of biomass fuel to a plant site.

Capable of Meeting Purpose and Need

Generating electricity from biomass residues is a proven and commercially available technology, although not a commercially feasible and reliable technology in the near term. Biomass power cannot meet purpose and need because of its higher cost and limitations on fuel availability at a large enough scale for baseload operation. A biomass project could result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, and it could conceivably provide some NNR industrial traffic through the conveyance of fuel to a plant site. Biomass power does not meet all of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.2.2 Biogas

The same types of anaerobic bacteria that produced natural gas also produce methane rich biogas today. Anaerobic bacteria break down or "digest" organic material in the absence of oxygen and produce "biogas" as a waste product. (Aerobic decomposition, or composting, requires large amounts of oxygen and produces heat.) Anaerobic processes can be managed in a "digester" (an airtight tank) or a covered lagoon (a pond used to store manure) for waste treatment. The primary benefits of anaerobic digestion are nutrient recycling, waste treatment, and odor control. Except in very large systems, biogas production is a highly useful but secondary benefit.

Digester biogas produced in anaerobic digesters consists of methane (50 to 80 percent), carbon dioxide (20 to 50 percent), and trace levels of other gases such as hydrogen, carbon monoxide, nitrogen, oxygen, and hydrogen sulfide. The relative percentage of these gases in biogas depends on the feed material and management of the process. Anaerobic digesters are used in municipal wastewater treatment plants and on large farm, dairy, and ranch operations for disposal of animal waste.

Landfill biogas is created when organic waste in a landfill naturally decomposes. This gas consists of about 50 percent methane, about 50 percent carbon dioxide, and a small amount of non-methane organic compounds. Instead of allowing landfill biogas to escape into the air, it can be captured, converted, and used as an energy source. Using landfill biogas helps reduce odors and other hazards associated with landfill biogas emissions, and it helps prevent methane from migrating into the atmosphere and contributing to local smog and global climate change.

The various types of biogas can be collected and used as a fuel source to generate electricity using conventional generating technology.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

Biogas power cannot fulfill the need for approximately 1,590 MW of highly reliable baseload capacity. The amount of digester gas and landfill gas resources is limited in the region and could only provide a small percentage of the fuel needed to generate power for the proposed project.

Environmentally Permittable

Environmental permitting would be fairly straightforward for a biogas power plant. This technology should be permittable in Nevada.

Cost Effectiveness Relative to Pulverized Coal

The total levelized cost over the life of a project to generate electricity from biogas (approximately $46 per MWh) is similar to the cost of power generated from a pulverized coal plant (approximately $50 per MWH).

Commercially Proven and Reliable

Production of electric power from both digester gas and landfill gas has been demonstrated commercially for many years. Digester or landfill gas can be used as fuel in reciprocating engines or in gas turbines to generate electricity.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A biogas project could place water held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a biogas plant would be expected to provide little, if any, traffic for the NNR.

Capable of Meeting Purpose and Need

Generating electricity from biogas is a proven, commercially reliable, cost effective, and environmentally permittable technology. However, biogas power cannot fulfill the need for approximately 1,590 MW of baseload capacity because the amount of digester gas and landfill gas resources is limited in the region. Also, a biogas project could probably result in the beneficial use of water held by White Pine County for power production in Steptoe Valley. It would provide little, if any, traffic for the NNR. Therefore, biomass power does not meet all of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.2.3 Municipal Solid Waste (MSW)

Municipal solid waste (MSW) typically uses a refuse derived fuel technology in waste-to-energy facilities to combust trash, garbage, and other combustible refuse. The material is received in its as-discarded form and subjected to segregation of some of the recyclables and shredding prior to being fed into the boilers for combustion. MSW provides energy for power production and at the same time provides waste volume reduction.

The plants range upward to 90 MW in size using multiple boilers to provide steam to a single condensing steam turbine generator. There also are a number of mass burn units in operation that burn the MSW directly in its as-discarded form with only the larger non-combustibles removed. Mass burn technology has largely given way to refuse derived fuel in response to pressure to recycle materials, and because the boilers designed to handle refuse derived fuel are more economical to build.

There is the potential for the production of toxic trace metals such as lead, mercury, and beryllium during the combustion process. This can be controlled somewhat by source separation (small batteries are a source of mercury) and by using selenium filters, which are effective in removing mercury from flue gas. However, the potential exists to require special disposal precautions because of the presence of these materials in the solid waste. The production of dioxins from the combustion of plastics has been an emissions concern. Dioxin production is controlled by maintaining sufficiently high combustion temperatures in the furnace with supplemental fuel, if required, to incinerate them.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

MSW power cannot fulfill the need for approximately 1,590 MW of highly reliable baseload capacity. The amount of MSW resources is limited in the region and could only provide a small percentage of the power to be generated by the Proposed Action.

Environmentally Permittable

Permitting a large MSW electric-generation facility would be a long and complicated process. The primary environmental disadvantage is related to emissions of hazardous air pollutants. This issue has made the permitting of MSW electric generation facilities a difficult process in many areas of the country and there is substantial public opposition to siting these facilities. The probability of obtaining a permit to operate is marginal.

Cost Effectiveness Relative to Pulverized Coal

New MSW to energy plants are not currently cost competitive with pulverized coal plants. The total levelized cost for a MSW power plant over its economic life converted to equal annual payments is approximately $85 per MWh compared to $50 per MWh for a pulverized coal plant. Typically, MSW power plants become economical only for congested areas in the eastern United States when landfills for MSW disposal are not available near the collection area and hauling costs become excessive.

Commercially Proven and Reliable

MSW technology is commercially proven and reliable, with operating facilities in multiple states.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

Because the feasibility of a MSW project in White Pine County is unlikely, it is doubtful but possible that water held by White Pine County for power production in Steptoe Valley would be put to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a MSW plant would be expected to provide traffic for the NNR through the conveyance of refuse-derived fuel to a plant site.

Capable of Meeting Purpose and Need

MSW power cannot fulfill the need for approximately 1,590 MW of long term, cost effective, and competitive generation of baseload capacity because of its high cost, low reliability (limited MSW resources in the region), and difficulty in obtaining a permit. A MSW project would probably not result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, but it could conceivably provide some NNR traffic through the conveyance of fuel from outside the region to a plant site. MSW power does not meet most of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station Project.

2.5.1.3 Nuclear

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

A nuclear power plant would be capable of fulfilling the need for approximately 1,590 MW of new, highly reliable, cost effective baseload capacity.

Environmentally Permittable

The permitting and licensing process for a nuclear power plant is more complex and difficult than for a pulverized coal plant.

Cost Effectiveness Relative to Other Energy Technologies

The total levelized cost of a nuclear power plant over its economic life would be comparable to that of a pulverized coal power plant (approximately $50 per MWh).

Commercially Proven and Reliable

Nuclear power is commercially proven and reliable, with a history of providing dependable baseload generation.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A nuclear power plant requires a huge amount of water for facility operation and cooling purposes. There is insufficient surface water in White Pine County for the operation of a nuclear power plant, and it is highly unlikely that the Nuclear Regulatory Commission would approve the use of ground water for plant operation and cooling. Therefore, a nuclear power plant would not place the use of water held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of a nuclear power plant would be expected to provide little, if any, traffic for the NNR.

Capable of Meeting Purpose and Need

A nuclear power plant is capable of meeting the purpose and need of approximately 1,590 MW of cost effective, highly reliable baseload generation. However, a nuclear power plant would not result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, would be difficult to permit and license, and would contribute to little, if any, traffic for the NNR. A nuclear power plant does not meet all of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.4 Non-Renewable Combustible Energy Resources

The non-renewable combustible energy resources evaluated in this section are natural gas combined cycle (NGCC), circulating fluidized bed (CFB) coal, integrated gasification combined cycle (IGCC) coal, and, last, pulverized coal (pulverized coal—the power generating technology selected for the proposed project). As noted in the introduction to this discussion of alternative power generating technologies, pulverized coal technology is described here to inform the reader and to compare pulverized coal technology to those alternative technologies that were eliminated from further consideration.

2.5.1.4.1 Natural Gas Combined Cycle (NGCC)

Combustion turbine generators are used for simple cycle and combined cycle applications. In simple cycle operation, gas turbines are operated alone, without any recovery of the energy in the hot exhaust gases. Simple cycle gas turbine generators are typically used for peaking or reserve utility power applications, which primarily are operated during the peak summer months (June through September) at less than a total of 2,000 hours per year. Simple cycle applications are rarely used in baseload applications because of the lower heat rate efficiencies compared to a combined cycle configuration.

Combined cycle operation consists of one or more combustion turbine generators exhausting to one or more heat recovery steam generators. The resulting steam generated by the heat recovery steam generators is then used to power a steam turbine generator.

There is a wide range of gas turbine sizes from approximately 1 MW output up to "G" and "H" class machines, which are rated at 240 MW and higher. Gas turbines for electric utility services generally range from a minimum of 20 MW for peaking service up to the largest machines for use in combined cycle mode.

Heat recovery steam generators extract energy from the combustion turbine exhaust gases in order to produce steam. On larger systems, steam is produced at several pressures and temperatures to most efficiently use the energy available. Reheat cycles are incorporated to take advantage of the higher exhaust temperatures available on the larger advanced technology combustion turbines.

The STG converts the energy produced by the HRSG in the form of steam into electrical energy. Larger STG units generally are pedestal mounted with the condenser located underneath the STG.

The condenser condenses the steam leaving the steam turbine generator and collects the condensate for return to the de-aerator. Condensation is accomplished by dissipating the energy into cooling or circulating water piped to and from a cooling tower (or intake and discharge from a waterway in the case of once-through cooling). Alternatively, an air-cooled condenser may be used on a site that has lack of water availability, cooling tower blowdown disposal problems, cooling tower freeze-up, cooling tower vapor plume problems, or circulating water pollution restrictions (in the case of once-through cooling). Air-cooled condensers present a set of disadvantages: lower cycle efficiency, higher first cost, bigger site, higher noise levels, and higher operation costs.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

NGCC plants have demonstrated high reliability and could supply baseload power generation capacity for the proposed project. Natural gas is not locally available and would require several hundred miles of new pipelines to deliver a sufficient quantity of gas to the plant site for the project.

Environmentally Permittable

A natural gas combined cycle facility has lower hazardous air pollutant and carbon dioxide emissions than a comparable coal-fired alternative. There are no major water discharge issues or solid waste/hazardous waste generation issues. Permitting of a NGCC power plant would be fairly straightforward.

Cost Effectiveness Relative to Pulverized Coal

NGCC plants have demonstrated high reliability and low maintenance costs. However, the electric power generation cost for a NGCC plant is higher than a pulverized coal plant because of the current high cost of the natural gas fuel. The total levelized cost for a NGCC plant over its economic life converted to equal annual payments is approximately $57 per MWh compared to $50 per MWh for a pulverized coal plant. Natural gas cost is highly variable and strongly affected by the economy, production and supply, demand, weather, and storage levels.

Commercially Proven and Reliable

NGCC power plants are commercially proven and reliable. Most new baseload power plant facilities built in the United States in the past 10 years have used NGCC technology.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A NGCC power plant would put to beneficial use water held by White Pine County for power production in Steptoe Valley.

Provide Traffic for the NNR

Construction and operation of a NGCC plant would be expected to provide little, if any, traffic for the NNR.

Capable of Meeting Purpose and Need

A NGCC power plant is a proven and commercially reliable technology for use in baseload power generation capacity and is environmentally permittable. However, natural gas is not locally available for the proposed project, has a higher cost than pulverized coal and a highly variable cost, and would require the construction of several hundred miles of new pipeline for gas delivery to the proposed plant. A NGCC plant would result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, but it would provide little, if any, traffic for the NNR. NGCC power does not meet two of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.4.2 Circulating Fluid-Bed (CFB)

In the mid 1980s, an alternative to the standard pulverized coal fired plant emerged called CFB combustion. The fuel delivery system is similar, although somewhat simplified, to that of a pulverized coal unit, but it has a greater fuel cost advantage because a wider range and lesser quality of fuels can be used (coal, coke, biomass, etc.). The bed material is composed of fuel, ash, sand, and sorbent (typically limestone). CFB units compete in the marketplace in sizes up to 300 MW with larger sizes available soon.

CFB combustion temperatures (1,500 to 1,600°F are significantly lower than a conventional boiler (3,000°F), which results in lower nitrogen oxide emissions and reduced slagging and fouling that are characteristic of pulverized coal units. In contrast to a pulverized coal plant, sulfur dioxide can be partially removed during the combustion process by adding limestone to the fluidized bed.

The plant fuel handling system unloads and stacks out the fuel, crushes or otherwise prepares the fuel for combustion, and reclaims the fuel as required. The fuel is usually fed into the CFB by gravimetric feeders. In the CFB, the fuel is combusted and steam is produced. Steam is conveyed to the steam turbine generator, which converts the steam thermal energy into mechanical energy. The turbine then drives the generator to produce electricity.

The CFB produces combustion gases, which must be treated before exiting the exhaust stack to remove fly ash and sulfur dioxide. Nitrogen oxide emissions can be mitigated through use of selective non-catalytic reduction using ammonia injection, usually in the upper area of the combustor. The pollution control equipment external to the CFB includes either a fabric filter (baghouse) or electrostatic precipitator for particulate control (fly ash), and a polishing FGD system for additional removal of sulfur dioxide to achieve similar levels to pulverized coal units. Limestone is required for the most common wet FGD process (limestone forced oxidation desulfurization) and also as sorbent for the fluidized bed.

Similar to a pulverized coal plant, a CFB power plant produces several forms of liquid and solid waste. Liquid wastes include cooling tower blowdown, chemicals associated with water treatment, ash conveying water, and FGD wastewater. Solid wastes include bed and fly ash and FGD solid wastes. As with pulverized coal fired units, disposal of these wastes is a major factor in plant design and cost considerations.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

CFB units are generally installed to burn poor quality or waste coals, but offer no advantage for commercial coal, which would be used in the Station pulverized coal power plant. The CFB technology is capable of fulfilling the need for approximately 1,590 MW of new, highly reliable baseload generation in eastern Nevada.

Environmentally Permittable

Environmental impacts associated with a CFB coal resource include air emissions, water/wastewater discharge issues, and solid waste disposal. Impacts are minimized by utilizing air pollution control equipment, wastewater pretreatment controls, and the potential reuse of ash. A CFB design has the advantage of being capable of burning a wider range of fuels, including waste materials such as coke or renewable biomass.

Permitting of a CFB coal power plant is similar to permitting a pulverized coal power plant, described previously.

Cost Effectiveness Relative to Pulverized Coal

The electric power generation cost for a approximately 1,590 MW CFB plant would be slightly higher than a pulverized coal plant because the unit size of a circulating fluid boiler is currently limited to approximately 300 to 350 MW compared to 800 to 900 MW for a pulverized coal unit. As an example, the capital cost of an approximately 1,590-MW 2-unit pulverized coal plant would be lower than a 5-unit CFB power plant because of the economy of scale for equipment cost. The total levelized cost for a CFB plant over its economic life converted to equal annual payments is approximately $50 per MWh, about the same as a pulverized coal plant.

Commercially Proven and Reliable

The CFB technology is commercially proven and reliable, having demonstrated technical feasibility in commercial utility applications for about 20 years. The largest CFB units in operation are about 300 MW in size.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A CFB power plant would put to beneficial use water held by White Pine County for power production in Steptoe Valley.

Provide Traffic for the NNR

Construction and operation of a CFB plant would result in traffic for the NNR, primarily through the conveyance of fuel to the power plant.

Capable of Meeting Purpose and Need

A CFB power plant would be capable of providing approximately 1,590 MW of reliable, environmentally permittable, baseload power generation. It also would result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, would contribute to traffic for the NNR, and would have approximately the same levelized cost as a pulverized coal power plant. A CFB power plant meets all six of the project purpose and need criteria. However, CFB does require a higher capital cost and offers no technical, operating economics, or environmental advantages over pulverized coal.

2.5.1.4.3 Integrated Gasification Combined Cycle (IGCC)

Coal gasification for use in power generation reacts coal with steam and oxygen under high pressure and at high temperature to produce a gaseous mixture consisting primarily of hydrogen and carbon monoxide. The gaseous mixture requires cooling and cleanup to remove contaminants and pollutants to produce a synthesis gas suitable for use in the combustion turbine portion of a combined cycle unit. The combined cycle portion of the plant is similar to a conventional combined cycle. The most significant differences in the combined cycle are modifications to the combustion turbine. These modifications allow use of a 250 to 300 Btu/SCF gas and steam production via heat recovery from the raw gas in addition to the combustion turbine exhaust. Specifics of a plant design are influenced by the gasification process, degree of heat recovery, and methods to clean up the gas.

IGCC has been demonstrated in a few commercial-scale facilities. A variety of coals have been gasified, the resulting gases have been cleaned up to allow use in combustion turbines, and electricity has been generated. However, the capital cost and performance in a number of areas have not been as attractive as expected. The troublesome areas for IGCC have included high-temperature heat recovery and hot gas cleanup. An important part of achieving an attractive heat rate is generation of high pressure and temperature steam from the high-temperature raw gas generated by gasifying coal.

The temperature of the raw gas is dependent on the gasification process and the coal. Slagging gasifiers, such as the Texaco process, typically generate gases in the 2,500 to 2,800°F range. These high-temperature gases contain corrosive compounds, such as hydrogen sulfide, that create a very demanding environment for the generation of high pressure and temperature steam. The reliable generation of steam under these conditions has not been demonstrated in a commercial application.

Alternatives of not recovering the heat in the raw gas, such as direct quenching of the gas, result in lower efficiencies. It also is attractive from an efficiency perspective to provide clean gas to the combustion turbine at an elevated temperature without cooling and reheating, hence the desire to use hot gas cleanup. Again, this demanding service has not been reliably demonstrated in a commercial application, resulting in less efficient approaches being used for current plants.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

The IGCC technology is not capable of providing approximately 1,590 MW of reliable baseload power generation for the proposed project. IGCC has problem areas that have not demonstrated acceptable reliability. The current approaches to improving reliability in these areas result in less efficient facilities, negatively impacting the cost-effectiveness. The U.S. Department of Energy has a program, Vision 21, with the goal of providing clean coal power-generation alternatives, which includes improving the cost-competitiveness of IGCC. However, the current U.S. Department of Energy time frame (by 2015) does not support the proposed project's schedule needs.

Environmentally Permittable

The overall environmental impacts from an IGCC design would be between those of a natural gas combined cycle turbine resource and a coal resource. Environmental impacts would include air emissions, water/wastewater discharge, and solid waste disposal.

Cost Effectiveness Relative to Pulverized Coal

IGCC has the potential to use coal in a more efficient process and with lower emissions than conventional coal power plants. The combined cycle portion of the process is attractive from a capital cost perspective compared to a conventional coal plant, but the addition of gasification, coal feeding, gas cooling, gas cleanup, and oxygen plant results in an overall cost that is higher than a conventional coal plant. The total levelized cost for a IGCC plant over its economic life converted to equal annual payments is approximately $62 per MWh compared to $50 for a pulverized coal plant. Until national legislation requiring carbon dioxide capture and sequestration is passed, IGCC will likely continue to have a cost disadvantage.

Higher efficiency than a conventional coal plant could justify higher capital costs. However, the currently demonstrated capital cost is approximately 20 to 30 percent higher and efficiency is about 5 percent better than a conventional coal plant. This cost and performance does not result in a cost of electricity that is competitive with a conventional coal plant. An effort to design an IGCC plant in northern Nevada using western coals was unsuccessful and was converted into an NGCC plant. For IGCC facilities operating on eastern coal, a significant issue has been the poor reliability of the gasifier.

Commercially Proven and Reliable

IGCC has been demonstrated in a few commercial-scale facilities. The current IGCC plants are providing good information about the technology. However, they are not demonstrating the necessary performance to expect the technology to be commercially proven, reliable, and available in a time frame to support the proposed project.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

An IGCC power plant, if and when commercially available, could use water held by White Pine County for power production in Steptoe Valley to beneficial use for power production.

Provide Traffic for the NNR

Construction and operation of an IGCC plant, if and when commercially available, would result in traffic for the NNR, primarily through the conveyance of fuel to the power plant.

Capable of Meeting Purpose and Need

The IGCC technology is not capable of meeting purpose and need for new baseload power generation because it has not demonstrated acceptance reliability and it has a higher cost than a pulverized coal power plant. An IGCC power plant does not meet half of the six project purpose and need criteria, and it does not meet the overall purpose and need of the proposed Station.

2.5.1.4.4 Pulverized Coal

A pulverized coal power plant was selected as the power generating technology for the proposed Station. It is described in the following text for purposes of comparison to those alternative energy technologies that were eliminated.

Modern pulverized coal power plants generally range in size from 80 MW to more than 1,600 MW and can use coal from various sources. Coal is most often delivered by unit train to the site, although barges or trucks are also used. Many plants are situated adjacent to the coal source where coal can be delivered by conveyor. Coal can have various characteristics with varying Btu heating values, sulfur content, and ash constituents. The source of coal and coal characteristics can have a significant effect on the plant design in terms of coal-handling facilities and types of pollution control equipment required.

Regardless of the source, the plant coal-handling system unloads the coal, stacks out the coal, reclaims the coal as required, and crushes the coal for storage in silos.

The coal is then fed from the silos to the pulverizers and blown into the steam generator. The steam generator mixes the pulverized coal with air, which is combusted, and in the process produces heat to generate steam. Steam is conveyed to the steam turbine generator, which converts the steam thermal energy into mechanical energy. The turbine then drives the generator to product electricity.

The steam generator produces combustion gases, which must be treated before exiting the exhaust stack to remove fly ash, nitrogen oxide, and sulfur dioxide. The pollution control equipment includes either a fabric filter (baghouse) or electrostatic precipitator for particulate control (fly ash), selective catalytic reduction for removal of nitrogen oxide, and flue gas desulfurization (FGD) system for removal of sulfur dioxide. Limestone is required as the reagent for the most common wet FGD process, known as limestone forced oxidation desulfurization. A limestone storage and handling system is a required design consideration with this system.

Pulverized coal plants produce several forms of liquid and solid waste. Liquid wastes include cooling tower blowdown, coal pile runoff, chemicals associated with water treatment, ash conveying water, and FGD wastewater. Solid wastes include bottom and fly ash and FGD solid wastes. Disposal of these wastes is a major factor in plant design and cost considerations.

Capable of Providing Approximately 1,590 MW of Reliable Baseload Power Generation Capacity

A pulverized coal power plant is capable of fulfilling the need for approximately 1,590 MW of new, highly reliable baseload generation in eastern Nevada.

Environmentally Permittable

Environmental impacts associated with pulverized coal resources include air emissions, water/wastewater discharge issues, and solid waste disposal. Impacts are minimized by utilizing air pollution control equipment, wastewater pretreatment controls, and the potential reuse of ash.

Permitting of a pulverized coal power plant typically requires numerous permits and approvals from federal, state, and local regulatory agencies. A major source Prevention of Significant Deterioration air construction permit would be required. The permit application, agency review and follow-up, and public comment process can be extensive for a new coal-fired resource.

Cost Effectiveness Relative to Other Energy Technologies

Pulverized coal plants, although having a high capital cost relative to some alternatives, have an advantage over other non-renewable combustible energy source technologies because of the relatively low and stable cost of coal. The relatively low fuel cost for coal results in a low cost of electricity. Over half of the electricity generated in the United States comes from coal-fired units, and almost all of it from pulverized coal units. There have not been many new pulverized coal units in recent years, but current fuel costs result in coal being the economical choice for large additions of new generation in areas with reasonable access to coal. The total levelized cost for a pulverized coal power plant over its economic life converted to equal annual payments is approximately $50 per MWh.

Commercially Proven and Reliable

Pulverized coal is commercially proven and reliable, with a long history of being the technology of choice for large baseload utility units. Pulverized coal plants represent the most mature of technologies considered in this analysis.

Place Water Held by White Pine County for Power Production in Steptoe Valley to Beneficial Use for Power Production

A pulverized coal power plant would put to beneficial use water held by White Pine County for power production in Steptoe Valley.

Provide Traffic for the NNR

Construction and operation of a pulverized coal plant would result in traffic for the NNR, primarily through the conveyance of commercial coal to the power plant.

Capable of Meeting Purpose and Need

A pulverized coal power plant is capable of meeting the purpose and need of approximately 1,590 MW of cost effective, highly reliable baseload generation. A pulverized coal plant would result in the beneficial use of water held by White Pine County for power production in Steptoe Valley, is environmentally permittable, and it would contribute to traffic for the NNR. A pulverized coal power plant meets all six of the project purpose and need criteria and the overall purpose and need of the proposed station.

2.5.2 Conservation/Energy Efficiency

Conservation/energy efficiency cannot be proposed by the Applicant (WPEA), and it is not an action the BLM or federal government can take in lieu of reaching a decision regarding implementation of the proposed project. Therefore, conservation/energy efficiency cannot be considered as an alternative to the proposed project and is not listed in Table 2-4. Conservation/energy efficiency can be a part of the proposed Station, however, and the energy projections described in the purpose and need discussion in Chapter 1 include consideration of conservation/energy efficiency programs.

2.5.3 Alternative Power Plant Site Locations

Results of the site selection study for the proposed Station are summarized in the following text. Siting study tasks included delineation of the study area boundary, identification of specific study regions and associated constraints in each region, identification of potential site areas by region for the Station, and comparison, evaluation, and selection of sites for detailed analysis in this EIS. Sites that were considered but eliminated from further consideration are described in the following text, together with the rationale for their elimination. The Proposed Action and Alternative 1, which were selected for detailed analysis in this EIS based on the comparison of alternative power plant sites, also are described in the following text. The full siting study report, together with supporting figures, is presented in *Siting Study for the Proposed White Pine Energy Station* (WPEA, 2005).

Steptoe Valley in White Pine County from Ely north to the White Pine/Elko county line was evaluated for potential sites for the construction of the Station. This study area boundary was selected for the following reasons:

- It meets project purpose and need.
- The Station must be located in White Pine County to utilize the water available from White Pine County in a locally beneficial manner.
- This part of Steptoe Valley is the only area in White Pine County that has ready access to all required

infrastructure components for the Station (that is, rail, SWIP corridor, water resources, and highway access).

No other locations in White Pine County have ready access to all of the required infrastructure components and were therefore eliminated from further consideration. The study area east of U.S. 93 (north of McGill) was eliminated from further consideration because it would require construction of more infrastructure, which would result in greater environmental impacts and additional costs, than the study area west of U.S. 93.

The remaining study area was divided into the northern, central, southern, and Ely-McGill study regions, which are depicted in Figure 2-19. Each of the four regions extends approximately 15 miles north to south. Constraints were then identified in each region in an attempt to avoid impacts on certain natural resources and avoid engineering feasibility issues. The siting analysis focused on ensuring engineering feasibility, minimizing environmental and socioeconomic impacts, and minimizing construction and operation costs of the Station.

Thirteen potential site areas were identified for analysis in the four regions. Table 2-5 compares the location of the major infrastructure components with respect to each potential site area. The following text compares these and other characteristics of the 13 potential site areas by study region.

2.5.3.1 Northern Study Region

Site areas in the northern region would require longer transmission lines to interconnect at Robinson Summit, longer pipelines and a less reliable water supply system, longer commutes for laborers from Ely and McGill, but fewer NNR upgrades than site areas in the other regions (Table 2-5).

Site area N1 has numerous disadvantages compared to sites N2 and N3, including but not limited to: (1) an additional transmission line would be constructed that would have environmental impacts, which could be avoided with selection of other sites, (2) greater commute distance from the Ely-McGill area, (3) additional impacts to Duck Creek because of a rail crossing, and (4) greater impacts to private lands and residences. Site area N1 was therefore eliminated from further consideration.

Site area N2 is relatively small, constrained by topography (some parts are steep while others are low-lying near Duck Creek), and is bisected by an existing north to south county road. Also, this site is near the community of Cherry Creek with an estimated population ranging seasonally between 15 and 40 people. Site area N3 has generally similar characteristics to site area N2, but without the previously mentioned constraints. Site area N2 was therefore eliminated from further consideration.

Site area N3 includes the potential power plant site identified in NEPA documentation completed in 1984 for the White Pine Power Project proposed by the Los Angeles Department of Water and Power. Site area N3 was carried forward for comparison with site areas identified in the other study regions.

2.5.3.2 Central Study Region

This region has little population with only scattered residences. The Pony Express Trail is in the northern half of the region and the area surrounding it is sensitive from a viewshed perspective. Infrastructure needs at sites in this region would be balanced between NNR upgrades and the potential to minimize new transmission line construction (Table 2-5).

TABLE 2-5

Approximate Distance to Major Infrastructure Components for Potential Site Areas in the Northern (N), Central (C), Southern (S), and Ely-McGill (E-M) Study Regions

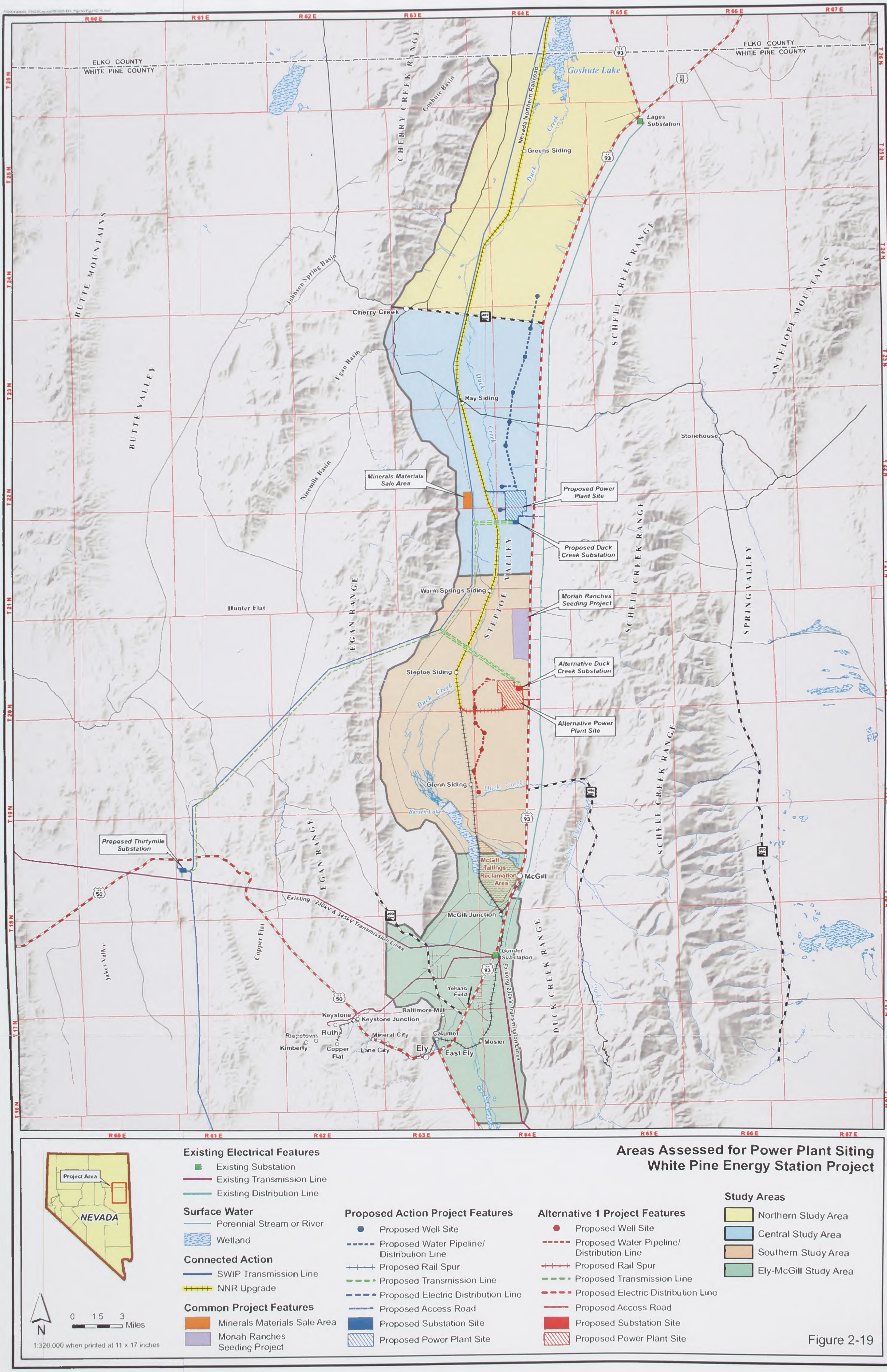
Potential Site Area	Approximate Distance to Major Infrastructure (miles)				
	Nevada Northern Railway	High-Voltage Transmission System		Water Supply System	Road Access to U.S. 93
		Outside of SWIP Corridor	Total Length to Robinson Summit		
N1	4	5	62	0	0
N2	2	2	48	6	7 (U.S. 93) 3 (SR-489)
N3	4	4	52	0	0
C1	3	3	46	0	0
C2	1	2	33	0	0
S1	1	0	26	3	5
S2	2	4	30	0	0
S3	3	6	30	0	0
S4	1	7	30	2	4
S5	2	12	36	2	0
EM1	0	0	21	10	0
EM2	2	3	29	21	0
EM3	1	0	26	18	3

Site area C1 is approximately 10 miles north of site area C2 (see Figure 2-19). Both areas have similar access to U.S. 93 and the water supply system. Site area C2 would require less transmission line construction outside of the SWIP corridor, and substantially less transmission line construction in general because it is closer to Robinson Summit. In addition, the transmission line for site area C1 would pass within 2 miles of two additional sage-grouse leks compared to site area C2.

Site area C2 is closer to the NNR, requiring a shorter rail spur. Site area C2 also is closer, and a shorter commute, to Ely-McGill. Site area C1 offers no significant advantages over site area C2 and was therefore eliminated from further consideration. Site area C2 was carried forward for comparison with site areas identified in the other study regions.

2.5.3.3 Southern Study Region

Site areas in the southern region would require more upgrades to the NNR than site areas in the central and northern regions but fewer upgrades than in the Ely-McGill region (Table 2-5).



Areas Assessed for Power Plant Siting
White Pine Energy Station Project

Figure 2-19

Site areas in the northern portion of this region generally would require fewer infrastructure improvements than site areas in the southern portion. Site areas S3, S4, S5 are similar in that none require crossing Duck Creek with the rail spur or water pipeline; however, the transmission line would cross Duck Creek (see Figure 2-19). Site area S5 is the farthest removed from the infrastructure and is also the closest to Bassett Lake, Steptoe Slough, McGill, and the Duck Creek pass. It has a shorter rail spur, but longer transmission line, water pipeline, and road improvements than site area S3. Site area S5 does not appear to offer any significant advantages over site area S3 and was therefore eliminated from further consideration.

Site area S4 is 4 miles from U.S. 93, directly west of the Duck Creek pass, and in the direct line of sight of traffic coming out of Duck Creek Basin. In addition, an electric transmission line from site area S4 to the SWIP corridor has a higher likelihood of impacting sage-grouse leks than site area S3. Site area S4 does not appear to offer any significant advantages over site area S3 and was therefore eliminated from further consideration.

The primary difference between site areas S3 and S2 is that the rail spur within site area S2 would require crossing private property and Duck Creek (see Figure 2-19). These impacts could be avoided with the selection of site area S3. Site area S2 was therefore eliminated from further consideration.

Site area S1 would potentially have the least amount of transmission line built and not cross Duck Creek, and the rail spur would cross private property but not Duck Creek (see Figure 2-19). However, an existing rural gravel road would need to be upgraded, causing increased traffic past nearby residences. Also, the water pipeline would cross Duck Creek. The area west of the gravel road was eliminated as a potential Station site because of construction challenges and costs associated with the 5 to 8 percent grade of the terrain. The area east of the gravel road is comprised of approximately 1,500 acres, about half of which is private property. A Station site in the eastern area would be within 2 miles of existing residences and require that fee rights to private property be obtained. For the above reasons, site area S1 was eliminated from further consideration. Site area S3 was carried forward for comparison with site areas identified in the other study regions.

2.5.3.4 Ely-McGill Study Region

Site areas in this region would require more upgrades to the NNR and longer lengths of water supply system pipelines than in any other study region because it is farthest south (Table 2-5). In addition, the increased train traffic from the project would have a greater impact on residences and delaying road traffic in the Ely-McGill region than other regions. Site areas within this region would offer the benefit of shorter commute distances for employees and better access to local services.

Each site area in the Ely-McGill study region poses construction feasibility issues, significant increases in project costs, and potential conflicts with surrounding land use. Site areas EM1 and EM3 present construction challenges because of the steep terrain, plus these areas would require rail sidings to unload coal trains and likely cause roads to be rerouted or closed. Locating the Station at site EM2 would conflict with the residential development pattern in this area. Generally, a site in the Ely-McGill region has the greatest potential to adversely affect the greatest percentage of people in White Pine County through potential traffic delays because of increased train traffic, noise impacts, and visual impacts. In addition, a significant amount of rail upgrades and water pipeline construction would be needed to service these sites. These impacts would be significant and could be avoided with the selection of sites in other study regions. Site areas EM1, EM2, and EM3 were therefore eliminated from further consideration.

2.5.3.5 Comparison and Evaluation of Remaining Sites (N3, C2, and S3)

Site areas N3, C2, and S3 were identified from among the 13 site areas in the four study regions for additional comparison. Specific station locations were identified in each site area to aid in the evaluation and comparison of the three sites. Table 2-6 compares infrastructure and environmental items of interest at the three alternative Station sites.

TABLE 2-6

Comparison of Infrastructure and Environmental Items of Interest at Station Sites for the Central, Southern, and Northern Alternatives

Item of Interest		Central Alternative		Southern Alternative		Northern Alternative	
Infrastructure							
Rail Spur	Length (feet)	5,500		15,000		24,200	
Transmission Line	Length to Robinson Summit (miles)	34		29		55	
Nevada Northern Railroad Upgrade	Length to Shafter (miles)	85		98		66	
Environmental							
Project Site	Estimated ROW acreage	1,280		1,330		1,560	
Transmission Line	Estimated ROW acreage	1,015		910		1,355	
Rail Spur	Estimated ROW acreage	15		37		56	
	Riparian Area	8		0		7	
	Sand Dunes (based on topography maps)	0		0		2	
Water Pipeline	Estimated ROW acreage	241		241		0	
Access Road(s)	Estimated ROW acreage	14		9		5	
	Total ROW acreage	**2,565**		**2,527**		**2,975**	
	Distance	**1 Mile**	**2 Miles**	**1 Mile**	**2 Miles**	**1 Mile**	**2 Miles**
Sage-Grouse Leks	Project Site	0	1	0	0	0	0
	Transmission Line	5	7	3	6	6	10
	Rail Spur	0	0	0	0	0	0
	Water Pipeline	0	0	0	0	0	0
	NNR (in White Pine County)	0	4	1	8	0	2
	Total Sage-Grouse Leks	**5**	**12**	**4**	**14**	**6**	**12**

TABLE 2-6

Comparison of Infrastructure and Environmental Items of Interest at Station Sites for the Central, Southern, and Northern Alternatives

Item of Interest		Central Alternative	Southern Alternative	Northern Alternative
Sensitive Species (within 1 mile)	Project Site	0	0	0
	Transmission Line	1	0	1
	Rail Spur	0	0	0
	Water Pipeline	0	0	0
	NNR (in White Pine County)	2	7	1
Total Sensitive Species (within 1 mile)		**3**	**7**	**2**
Socioeconomic	Approximate Distance from Ely (road miles)	32	21	49

Comparison of the three sites shows that the Central and Southern Alternatives have a distinct advantage over the Northern Alternative. The Central and Southern Sites would require less construction of new infrastructure and are closer to the communities of McGill and Ely, which is consistent with the purpose and need statement for the proposed project (see Section 1.2, *Purpose, Need, and Background*). Specifically, the Northern Alternative Site would require more transmission line, a longer rail spur, larger ROW acreages, and be farther from McGill and Ely than either the Central or Southern Alternative Sites. All three sites have comparable potential impacts to sage-grouse leks. More sensitive species occur within 1 mile of the Southern Alternative Site than the two other sites. However, these species occurrences are related to the NNR, which is an existing facility to be upgraded (rather than a new facility to be constructed).

The primary advantage of the Northern Alternative Site is that fewer NNR upgrades would be required because coal trains would not travel as far south into Steptoe Valley. However, the cost of railroad upgrades would be less than the cost of constructing new transmission line on a per mile basis. In addition, the environmental impacts of upgrading an existing rail line would likely be less than constructing a new transmission line and would result in less public and private lands used for the project.

The White Pine Power Project Final EIS (BLM, 1984a) identified the Northern Alternative Site area as having a high potential for cultural resources, especially in and around the sand dunes where intact resources likely occur. Portions of the sand dunes would be disturbed during construction of the rail spur and electric line. These impacts could be avoided at the Central Alternative and Southern Alternative Sites. In addition, while the rail spur on the Northern Alternative Site could avoid the main bed of Duck Creek, it would still need to cross a wide low-lying area that contains several other drainage fingers of Duck Creek. The Southern Alternative Site provides the ability to build a rail spur without crossing Duck Creek and its related drainage features, so carrying the Northern Alternative Site forward for this reason alone is not justified. Other potential detriments of the Northern Alternative Site include the less reliable water supply system, impact to considerably more grazing permittees, and the shallow ground water table on portions of the site, as identified in the White Pine Power Project Final EIS (BLM, 1984a). A shallow ground water table at the Northern Alternative Site could substantially increase construction costs and result in greater environmental impacts from having to perform construction dewatering activities.

The only apparent potential advantage of the Northern Alternative Site is fewer upgrades to the NNR. The increased environmental and land impacts for other aspects of this site could be avoided and/or minimized by selecting the Central and/or Southern Alternative Sites. It is noteworthy that when the White Pine Power Project Final EIS was being prepared, potential sites in the Central and Southern study regions were classified as non-attainment status for sulfur dioxide air emissions. Thus, there was an incentive and need at that time to locate the White Pine Power Project farther north in Steptoe Valley. Based on the above reasons, the Northern Alternative Site is not considered a site to be carried forward for detailed analysis in this EIS and was therefore eliminated from further consideration.

The Central and Southern Alternative Sites are the most suitable sites to be consistent with project purpose and need and to minimize environmental impacts and construction costs of the Station. These sites were carried forward for further environmental analysis in this EIS and are referred to as the Proposed Action (Central Alternative Site) and Alternative 1 (Southern Alternative Site).

2.5.4 Alternative Cooling Technology

The original Proposed Action and Alternative 1 as described in the public scoping meetings were based on the use of up to two generating units and conventional, mechanical draft wet cooling towers with a total water usage of up to 25,000 acre-feet annually. Several scoping comments were received that expressed concern regarding the effects of using up to 25,000 acre-feet annually of ground water for cooling purposes and suggested that the action alternatives incorporate other cooling technologies. Subsequently, WPEA modified the action alternatives so that both the Proposed Action and the Alternative 1 that are analyzed in detail in this EIS would use up to three generating units and a hybrid cooling system with a maximum water usage of up to 5,000 acre-feet annually. Table 2-7 compares specifics of the original power plant design described during scoping and the presently proposed power plant design. The advantages of using a hybrid cooling system would be as follows:

- Water usage would be reduced by approximately 80 percent.
- Temporary and permanent ROW acreage would be reduced by 75 to 85 percent.
- Electric distribution lines to the wells would be approximately 60 miles shorter.
- The surface area of the evaporation pond would be reduced by approximately 245 acres.
- No steam plumes would be issued by the natural draft cooling towers.

In contrast, a hybrid cooling system would have the following drawbacks:

- Capital costs would be higher.
- Overall plant efficiency would be lower.
- The natural draft cooling towers are larger and would be more visible than the mechanical draft cooling towers.

TABLE 2-7

Comparison of Original and Revised Power Plant Design Alternatives

	Original Power Plant Design	Revised Power Plant Design
Generating Units	Up to two (500 to 800 MW each), approximately 1,590 MW total	Up to three (approximately 530 MW each), approximately 1,590 MW total
Cooling Towers	Up to two sets of mechanical draft cooling towers (rectangular, approximately 60 feet tall)	Up to three sets of natural draft, dry cooling towers with spray augmentation (approximately 590-foot diameter at the base; approximately 550 feet tall)
Evaporation Pond	320 acres (maximum)	75 acres (maximum)
Total Plant Water Usage	25,000 acre-feet per year (maximum)	5,000 acre-feet per year (maximum)
Wells And Water Pipeline	22 wells; approximately 55 miles of pipeline; 278 acres of permanent ROW	8 wells; approximately 13 miles of pipeline (8 miles for Alternative 1); 68 acres of permanent ROW (43 acres for Alternative 1)
Electric Distribution Lines	More than 70 miles for the wells	Approximately 13 miles (8 miles for Alternative 1) for the wells

Figure 2-20 shows the original well field configuration of the 22 wells.

2.5.5 Alternative Power Plant Site Configuration

The initial configuration of the power plant site for the Proposed Action was approximately as wide from east to west as north to south. This configuration was modified to make the power plant site narrower in the east-west direction and slightly more elongated in the north-south direction. These changes would benefit wildlife movement, specifically antelope, in the valley and would ensure the power plant site does not overlap with Duck Creek riparian areas on the valley floor.

2.5.6 Alternative Rail Spurs

The initial location and configuration of the rail spur proposed by WPEA for the Proposed Action was modified in order to minimize the potential for impacts on Duck Creek and its associated wetlands. WPEA proposed three potential locations for consideration of the rail spur location (then referred to as Alternative A, Alternative B, and Alternative C) as shown in Figure 2-21.

Items considered in the selection of the rail spur alternatives included:

- Eliminate crossing Duck Creek where there is a “split” or “dual creek” bed.
- Avoid, to the extent possible, areas with multiple “drainage fingers.”
- Cross Duck Creek riparian area as perpendicular as possible to minimize disturbance.
- Rail spur must enter the rail loop at a location that minimizes unloading time and, therefore, lessens onsite noise and locomotive emissions.
- Minimize the amount of railroad built and upgraded to handle coal trains.

Examination of aerial photographs, mapping of the rail spur routes, and field investigations showed that Alternatives A and C would avoid the high quality ponds and wetland complex that would be crossed by Alternative B and which may provide habitat for wildlife such as migratory birds, resident avian species, and big game. Alternative A would provide a greater buffer for the large wetland complex located along Alternative B than would Alternative C, which would be a short distance south of this better quality wetland. Overall, Alternative A would reduce direct impacts and minimize hydrological impacts to the wetland complex located between Alternatives A and C. Alternative A was therefore selected as the preferred rail spur to be analyzed in detail in the EIS, while Alternatives B and C were eliminated from further consideration.

2.5.7 Alternative Structure Designs for Crossing Duck Creek

Traditionally four main types of bridges exist: trestle, box culvert, span or girder, and truss spans. Each commonly used bridge types can be built with a single-span or multiple spans. Single-span bridges are often preferred where environmental sensitivity is high and creek disturbance must be kept to a minimum. Multiple span bridges often have more impacts on creeks, but these impacts can often be mitigated by the bridge configuration and the placement of bridge supports and abutments.

In selecting the bridge for the Duck Creek crossing the following criteria were used:

- Minimize impacts on the creek
- Consider the height of the bridge to avoid flood water impacts
- Minimize the railroad embankment approach impacts
- Minimize cost as much as is feasible considering the other factors

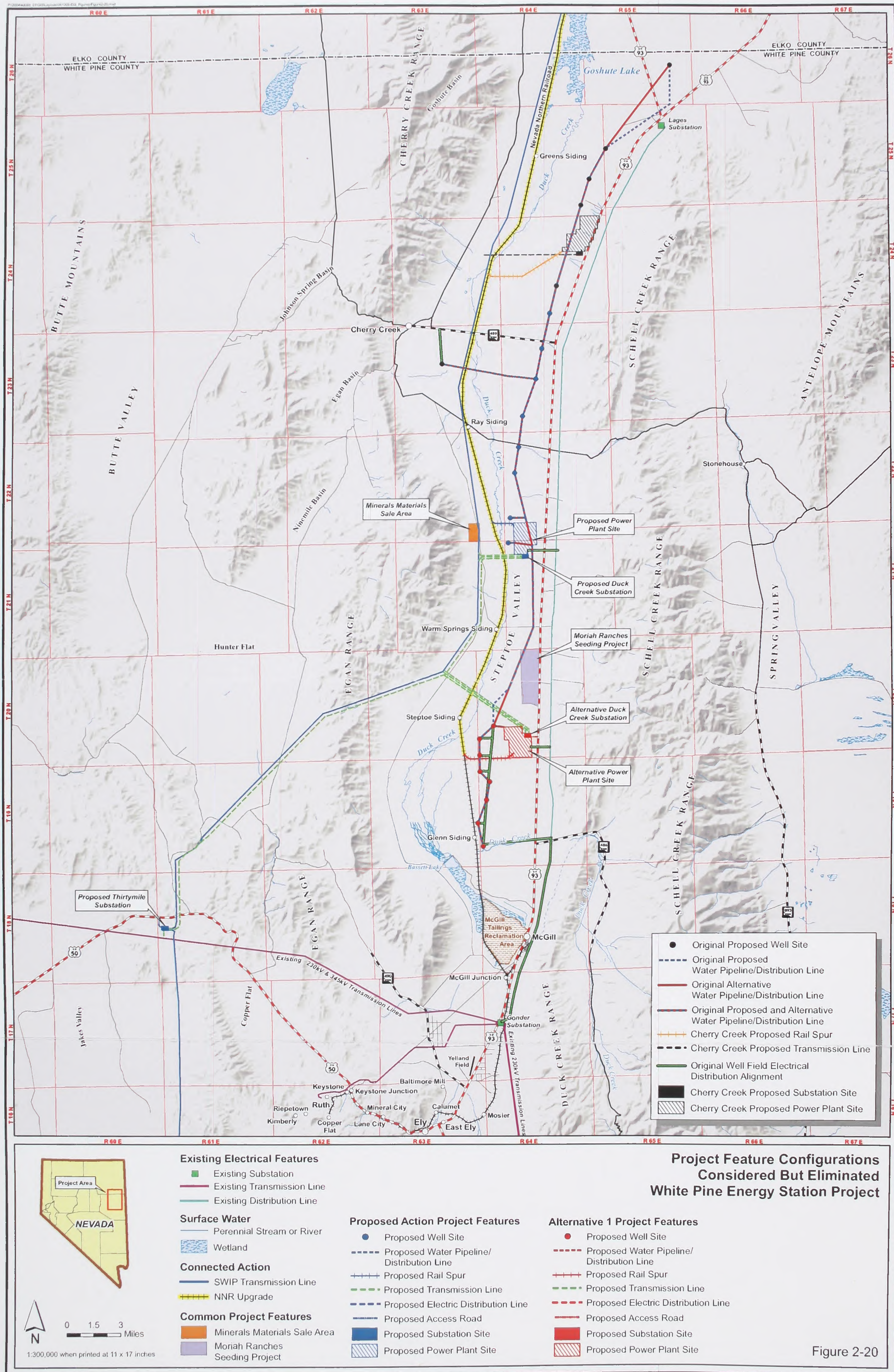
The three-span trestle bridge would minimize cost while being mindful of environmental impacts. The box culvert bridge, which is typically used in road applications, is not the most economical and would have more impacts on the creek than other bridge types. The single-span or girder bridge would be more expensive than a trestle bridge; however, it would result in the least impacts on the creek.

The truss span bridge would not be appropriate for the Duck Creek crossing because of the relatively short crossing width.

A single-span or girder bridge is the preferred choice for the Duck Creek. It would have minimum impact on the creek because it would not require any piles in the creek bed. The single-span or girder bridge has flexibility in length (up to approximately 65 feet for a single span) and would be less costly than some other designs. For these reasons, the other bridge structures described above were not carried forward for detailed analysis.

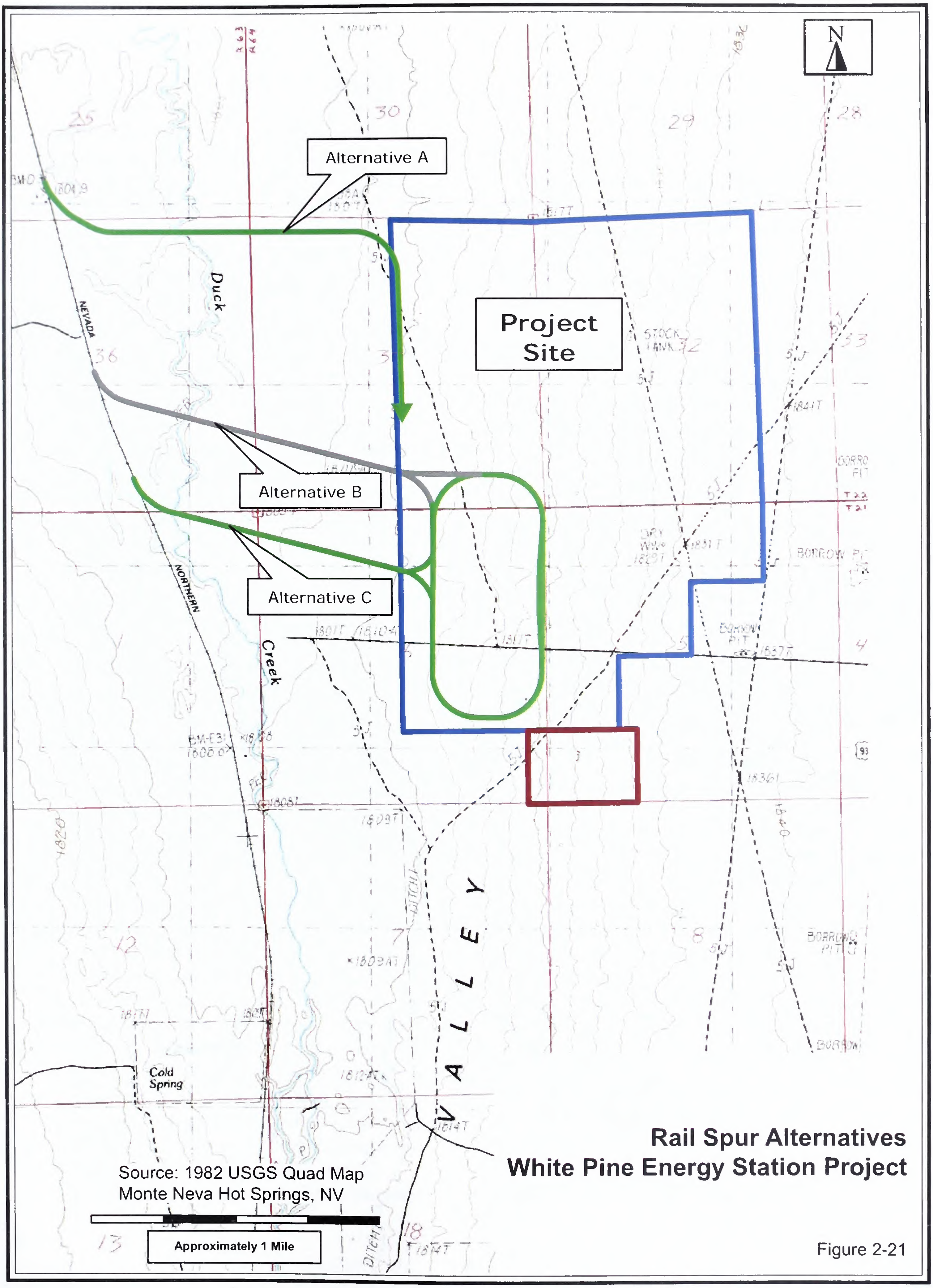
2.5.8 Alternative Well Field Electric Distribution Line Alignments and Design

Two alternative alignments to the wellfield electric distribution lines presently proposed by WPEA were initially considered, principally to avoid or minimize potential impacts to avian species. Figure 2-20 shows the alternative alignments. Both alternatives were eliminated from further analysis because WPEA's presently proposed electric distribution line is shorter, would originate



Project Feature Configurations Considered But Eliminated
White Pine Energy Station Project

Figure 2-20



Rail Spur Alternatives
White Pine Energy Station Project

Figure 2-21

at the SWIP line where it interconnects with the new substation adjacent to the Proposed Action and Alternative 1 power plants, and would have a greater potential for avoiding or minimizing impacts to avian species than either of the alternatives. The first eliminated alternative alignment would have paralleled the existing power lines east of U.S. 93, while the second eliminated alternative alignment would have located the lines just west of the U.S. 93 Nevada Department of Transportation ROW. Both alternatives included new electric distribution lines that would have paralleled or replaced existing lines from a substation near McGill to just north of McGill, crossed U.S. 93 to the west, then intersected the water pipeline alignment and followed it to the northern-most well site. Based on the potential for impacts to the viewshed, avian predation, and cultural resources, together with increased construction and maintenance costs, the BLM Ely Field Office decided to eliminate the two alignment alternatives depicted in Figure 2-20 from further consideration and analyze the alignment proposed by WPEA in detail in this EIS. That alignment originates at the SWIP line where it interconnects with the new substation adjacent to the Proposed Action and Alternative 1 power plants.

WPEA's proposed design of the electric distribution lines includes constructing overhead lines to serve the well fields. An alternative design that was initially considered was placing the electric distribution lines underground rather than overhead to avoid or minimize potential impacts to avian species. At that time, representatives of Mt. Wheeler Power Company expressed concerns with the reliability of service of buried lines, even if only segments of the main electric distribution line were buried in areas most sensitive to wildlife. In addition, BLM Ely Field Office archaeologists expressed concerns regarding potential added impacts to cultural resources from widening the zone of disturbance needed to bury the power line adjacent to the water pipeline. However, Mt. Wheeler Power and WPEA proposed that all power feeds from the main electric distribution lines to individual wells would be buried. Based on these discussions, the BLM Ely Field Office decided that the overhead electric distribution lines with buried feeds to individual well sites as described in WPEA's proposal would be carried forward for detailed analysis in this EIS. The BLM Ely Field Office decided that the alternative of burying the entire electric distribution lines would be eliminated from further consideration.

2.5.9 Alternative Transmission Line Route

An alternative transmission line route extending to Robinson Summit via the Gonder Substation, rather than following the SWIP corridor, was considered. Figure 2-20 shows this alternative transmission line route. This route follows the Steptoe Valley floor south to the Gonder Substation, and then the Falcon-Gonder and other existing transmission lines west-northwest to Robinson Summit. This same alternative transmission line route (labeled as subroute 11e) and four other alternative routes to Robinson Summit were evaluated by the BLM (1993) in the SWIP Final EIS for potential impacts on biological, earth, land use, cultural, visual, and planning resources.

The SWIP Final EIS concluded that, overall, subroute 11e ranked much lower than the other four routes (BLM, 1993). Although subroute 11e ranked highest (best) for biology (wildlife) and cultural effects, it ranked lowest (worst) for earth, visual, land use, and planning effects. The SWIP Final EIS stated, "Subroute 11e would result in significant and unavoidable direct impacts to wetlands area around Bassett Lake northwest of McGill, Nevada…" and also that subroute 11e "passes near residences." Because of these environmental impacts, this alternative transmission line route was eliminated from further consideration. Subroute 11e also was eliminated from further consideration in the SWIP Final EIS (BLM 1993).

The alternative Falcon-Gondor Substation/Transmission Line site was eliminated from further consideration because it conflicts with private property, would require two power lines, and result in viewshed impacts.

2.6 Preferred Alternative

BLM's Preferred Alternative is the Proposed Action.

Chapter 3.0 Affected Environment

3.1 Introduction

This chapter describes the affected environment associated with the Proposed Action and Alternative 1 for the White Pine Energy Station (the Station). The discussions describe existing conditions for those resources comprising the physical, biological, cultural, and human and socioeconomic environments within the project area. Figures 2-1 and 2-17 in Chapter 2 depict the project area and project features for the Proposed Action and Alternative 1, respectively. The project areas and project features for the Proposed Action and Alternative 1 are described in detail in Chapter 2, Sections 2.1 through 2.3.

3.2 Geology, Soils, and Minerals

This section provides context for the subsequent evaluation in Chapter 4, *Environmental Consequences,* of potential project-induced environmental consequences to geological, soils, and mineral resources in the White Pine Energy Station project area. Additional geologic related information is presented in Section 3.4, *Ground Water Resources*, as context for evaluating potential impacts to ground water resources.

3.2.1 Geology

3.2.1.1 Regional Geologic History and Setting

The project area is located within the Basin and Range Physiographic Province, which primarily comprises the State of Nevada, western Utah, and southeastern Idaho and Oregon (see Figure 3.2-1). The Basin and Range Physiographic Province owes its descriptive name to the general geologic history common to this part of the country that has given rise to the present-day landscape of alternating generally north-south trending mountains separated by intervening valleys or basins (BLM, 2003).

Although the current landscape formed only during the past 10 to 20 million years, the geologic history of the region is much longer with important features dating to the Precambrian Era (more than 550 million years before present). The metamorphic rocks (quartzites and schist) of Precambrian age are the oldest and lowest unit in the regional stratigraphic column and are therefore commonly referred to as "basement." Early Cambrian age formations (approximately 500 million years before present) principally consisting of quartzite and shale are also typically considered basement, primarily because of their relatively impermeable nature with respect to ground water flow (BLM, 2003) (see Section 3.4, *Ground Water Resources*).

Throughout the Paleozoic Era, beginning in the early Cambrian time and continuing into the Permian Period (approximately 250 million years before present), present-day eastern Nevada formed the continental shelf off of what was then the west coast of North America (the ancient shoreline ran through present-day western Utah). This shallow marine environment gave rise to the deposition of massive sequences of carbonate rocks (such as limestone and dolomites) that accumulated to thicknesses of as much as 30,000 feet. The area that formed the ancient continental shelf stretched from present-day southern Idaho, across western Nevada to southeastern California. The resulting carbonate deposits are exposed in the many mountain ranges, and form a thick wedge, generally thinning eastward, that constitutes an extensive regional feature commonly referred to as the Carbonate Rock Province (see Section 3.4.1.2, *Fractured-Rock Ground Water Systems*). The thickness and lithology (composition) of the Paleozoic carbonate rocks are notable in their homogeneity over large areas in the province (BLM, 2003).

The Permian Period (between 240 and 290 million years before present) generally marked the end of the environment that produced the thick deposits of carbonate rock and by the middle Triassic (225 million years before present) the continental margin began to shift westward so that present-day eastern Nevada was an area of continental deposition. Rocks of middle Triassic to Early Jurassic age in eastern Nevada, therefore, largely consist of sandstone, shale, and freshwater limestone (BLM, 2003).

It was also during the late Mesozoic that the Seveir orogeny (period of mountain building) occurred that coincided with extensive regional compression of the earth's crust generally along the same belt that formed the ancient continental shelf during Paleozoic time (from southern Idaho through western Utah and southeastern California).

The geologic structure of the region became even more complex in the middle and late Tertiary (starting around 20 million years before present) when the tectonic forces reversed, resulting in crustal extension (stretching). The entire region underlying present-day eastern Nevada was essentially pulled apart by tensional forces. Large-scale normal (vertical offset) faulting caused huge blocks to be dropped, tilted, or rotated in response to being pulled apart or thinned. In addition to extensive normal faulting, nearly vertical strike-slip (lateral offset) faulting also occurred during the middle and late Tertiary times. The overall result of the east-west extensional tectonics was that north-south oriented mountain ranges were raised and tilted, and basins formed in the intervening depressed areas. Erosion of the mountain ranges and the subsequent deposition of the erosional debris filled the valleys with several hundred to several thousand feet of sediment. The resulting parallel sequence of mountain ranges and intervening basins, interspersed with mountains of volcanic origin, combine to give the region its characteristic basin-range topography seen today (BLM, 2003).

3.2.1.2 Local Geology

All of the components of the Station Proposed Action and Alternative 1 sites would be located in White Pine County. Although specific aspects of the geology of White Pine County are described in several reports and publications, the principal source of geological information for this Draft Environmental Impact Statement (DEIS) is Hose and Blake (1976). A geologic map of the area of the Station Proposed Action and Alternative 1, from Hose and Blake (1976), is shown in Figure 3.2-2.

The locations of the access roads for both the Proposed Action and Alternative 1 are near the center (in an east-west direction) of Steptoe Valley. Structurally, Steptoe Valley consists of a tectonic basin that was created by vertical offset along the principal north-south trending range-front geologic faults at the base of the Schell Creek Range to the east, and the Egan Range and Cherry Creek Mountains to the west. Crustal extension during the Tertiary Period caused the block between these faults to drop, creating a deep basin that subsequently filled with several thousand feet of alluvial sediments generically referred to collectively as basin-fill deposits.

Location and General Extent of the Basin and Range Province White Pine Energy Station Project

Source:
Fenneman's 1:7,000,000 Physical Divisions Of The United States - USGS

Figure 3.2-1

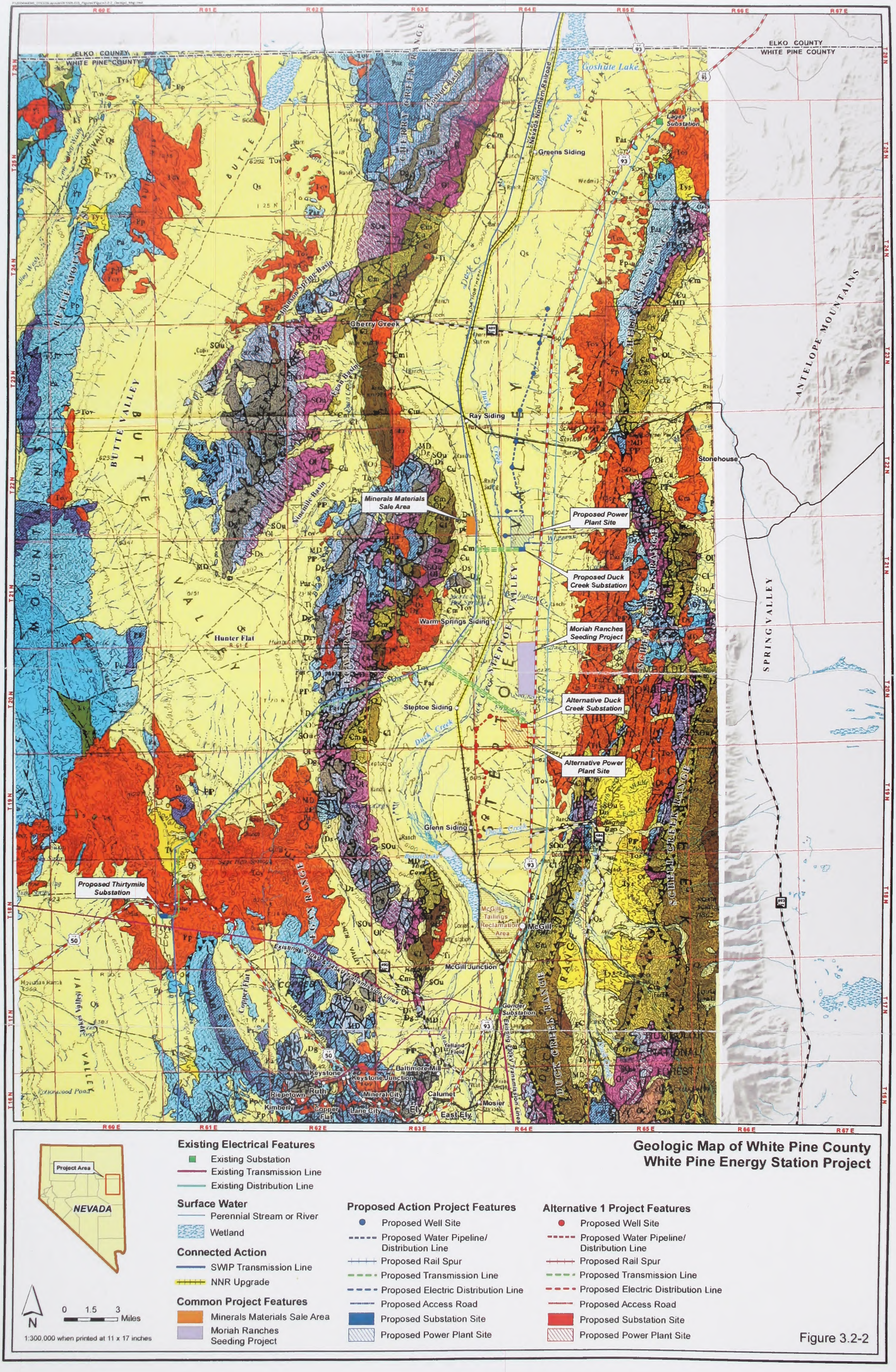
The basin-fill deposits generally include the entire spectrum of unconsolidated sediment textures from clay and silt to sand and gravel, deposited in interbedded layers of various mixtures. The basin-fill material is produced by erosion of the surrounding mountains. The resulting sediment is transported into the valley by the various streams and creeks that drain the mountain slopes and subsequently deposit the material in alluvial fans that eventually coalesce and fill the valley to its present elevation. Geologic logs of boreholes drilled in the valley indicate considerable variability in the basin-fill stratigraphy across Steptoe Valley and even between locations that are less than 1,000 feet apart (see Section 3.4.2.3, *Local Ground Water Occurrence*).

The wellfields for the Station Proposed Action and Alternative 1 are located parallel to the central north-south axis of Steptoe Valley. Accordingly, the geologic setting is the same as for both the Proposed Action and Alternative 1. Geologic and hydrologic conditions associated with the wellfields are described in detail in Section 3.4, *Ground Water Resources*.

The right-of-way (ROW) for the transmission line would initially traverse Steptoe Valley before crossing the Egan Range to the west of the Station Proposed Action and Alternative 1 locations. The portion of the Egan Range that would be crossed by the transmission line ROW is a 4-mile strip (approximately) composed primarily of Paleozoic carbonate rocks that include both relatively older (Devonian, 350 million years before present) limestone of the Guilmette Formation, and relatively younger (Permian, 250 million years before present) calcareous sandstone (Rib Hill Sandstone) and limestone (Arcturus Formation). After descending down the western flank of the Egan Range, the transmission line ROW would cross the basin-fill deposits of Butte Valley before climbing up the western arm of the Egan Range south of Butte Valley at Robinson Summit. This western portion of the Egan Range that would be crossed by the transmission line ROW is composed primarily of Tertiary volcanic rocks, but it also includes a pocket of younger sedimentary rocks where the easement takes an abrupt turn to the south below Robinson Summit.

3.2.1.3 Geologic Faults and Seismicity

Steptoe Valley was created by a vertical offset along range-front geologic fault systems that run along the base of the Egan Range and Cherry Creek Mountains to the west (Steptoe Valley fault system), and the Schell Creek Range to the East (Central Steptoe fault zone and Connors Canyon fault zone) (see also Section 3.2.2, *Soils*). These north-south trending fault systems are mapped over lengths up to 100 miles, and are included in the U.S. Geological Survey (USGS) Quaternary Fault Database, indicating that some movement has occurred along these fault systems within the last 1.6 million years. Of these Quaternary aged faults, the nearest active faults with respect to either the Station Proposed Action or Alternative 1 power plant sites are located along the base of the eastern flank of the Schell Creek Range (that is, in Spring Valley), and along the base of the western flank of the Egen Range, south of Ely (http://quake.wr.USGS.gov/info/faultmaps). Active faults are typically considered to have had movement within the last 10,000 years (within the Holocene) (Yeats et al., 1997).



Geologic Map of White Pine County
White Pine Energy Station Project

Figure 3.2-2

Specifically, the Steptoe Valley fault system is primarily a series of vertical faults where the offset has been down and to the east. The fault system runs along essentially the entire length of the eastern margin of the Cherry Creek Mountains and southern Egan Range (approximately 150 km). South of Ely, the fault system curves to the southeast into the southern part of Steptoe Valley. Based on the age of basin-fill deposits at the ground surface that have been displaced, the most recent movement along this fault is within the last 130,000 years.

The central Steptoe Valley fault zone is a linear series of down-to-the-west normal (vertical) faults that forms the western margin of the Schell Creek Range and extends into southern Steptoe Valley south of Ely. Based on the age of the sediments that have been offset by this fault zone, the most recent movement occurred within the last 130,000 years. East of the southern extent of the central Steptoe Valley fault zone is the Connors Canyon fault zone. This zone continues for 20 km along the western front of the Schell Creek Range where the central Steptoe Valley fault zone leaves off and defines the eastern margin of Steptoe Valley with the Schell Creek Range south of Ely. The most recent offset along this fault zone is only known to have occurred sometime in the last 1.6 million years.

In addition to these range-front faults a group of unnamed Quaternary aged faults has been mapped within the center of Steptoe Valley east and south of Ely along the alignment of Steptoe Creek (see Section 3.3, *Surface Water Resources*). The specific age of the last historical movement along these faults is unknown.

None of these aforementioned fault systems coincide with the proposed power plant sites, the wellfields, or the access roads or rail spurs under either the Station Proposed Action or Alternative 1. The transmission line ROW would cross the fault system along the eastern edge of the Egan Range as well as fault traces associated with a series of faults in the Western Egan Range fault zone. Similar to the fault zones of Steptoe Valley, the Western Egan Range fault zone is identified as being of Quaternary age with no specific offset dated within the last 1.6 million years.

No major earthquakes (greater than magnitude of 5.5) have been recorded within 100 miles of the project area since at least 1769 (USGS Earthquake Events, 2005). The current level of earthquake potential in eastern central Nevada is relatively low and is the lowest of anywhere in Nevada (USGS peak acceleration return frequency maps). According to the USGS (USGS peak acceleration return frequency maps), all of the components of the Station Proposed Action and Alternative 1 sites are located within an area where the probability is 10 percent that within the next 50 years an earthquake capable of generating a ground acceleration of only 0.08 g (g is the force of gravity) will occur.

For context, an earthquake with an intensity of Level VII on the Modified Mercalli Scale equates to an average peak ground gravitational acceleration of between 0.1 and 0.15 g (Bolt, 1993). This level of ground acceleration would cause only slight damage to well-built buildings, but would cause considerable damage to poorly built structures. An intensity of Level VII on the Modified Mercalli Scale was used for reference because that is the intensity level anticipated in the project area for the Station Proposed Action and Alternative 1 in response to a major earthquake, according to the seismic zone map in Appendix C of the Uniform Building Code.

3.2.2 Soils

The source of information for soils within the Station project area is the Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service, 1998).

The components of the Station Proposed Action and Alternative 1 cover five general soil map units (NRCS, 1998):
(1) Equis-Kunzler-Duffer, (2) Wintermute-Kunzler-Sycomat, (3) Palinor-Shabliss-Blimo, (4) Cowgil-Cassiro-Yody, and (5) Pookaloo-Hyzen-Cavehill.

The locations of the wellfields, access roads, rail spurs, and power plants for both the Proposed Action and Alternative 1 would be within the Equis-Kunzler-Duffer soil unit. The Station transmission line ROW would cross all five soil map units.

The **Equis-Kunzler-Duffer** unit is principally composed of soils associated with flood plains, fan piedmonts, and stream terraces. This soil unit is primarily found in the low-lying regions of central Steptoe Valley. Equis soils are poorly drained, are found on nearly level flood plains adjacent to areas of springs and seeps, and have a fine textured surface layer and subsoil. Kunzler soils are well drained and occur on nearly level and gently sloping stream terraces. They have a medium textured surface layer and a medium to moderately coarse textured subsoil. Duffer soils are poorly drained and occur on nearly level, axial-stream flood plains. They have a medium textured surface layer and a moderately fine textured subsoil. Land use on this soil unit is mainly livestock grazing and wildlife habitat (NRCS, 1998).

The **Wintermute-Kunzler-Sycomat** unit borders the flood plain and low-lying regions in Steptoe Valley, including gently sloping fan piedmonts. These soils are typically very deep and well drained. Wintermute soils occur on nearly level and gently sloping fan piedmont remnants. They are gravelly and moderately coarse textured in the surface layer and very gravelly and moderately coarse textured in the subsoil. Kunzler soils occur on gently sloping fan piedmonts, and have a medium textured surface layer and a moderately coarse textured subsoil. Sycomat soils occur on nearly level and gently sloping fan piedmonts, and are moderately coarse textured throughout. Land use on this soil unit is mainly livestock grazing and rangeland wildlife habitat (NRCS, 1998).

The **Palinor-Shabliss-Blimo** unit occurs on gently sloping and moderately sloping fan piedmont remnants. These soils are typically well drained and can be either shallow or very deep. Palinor soils, in particular, are shallow and occur over a hardpan substrate (duripan) typically on gently sloping and moderately sloping fan piedmont remnants. The texture of these units is gravelly. Shabliss soils are also shallow and occur over a duripan, but one that is much more cemented, on gently sloping and moderately sloping fan piedmont remnants. Their texture is gravelly. Blimo soils are very deep and occur on nearly level and gently sloping fan skirts. These soils have a medium textured surface layer and a moderately coarse textured subsoil. Land use on this soil unit is mainly livestock grazing and rangeland wildlife habitat (NRCS, 1998).

The **Cowgil-Cassiro-Yody** unit consists of gently sloping to strongly sloping, well drained soils that are moderately deep over a duripan or are very deep. Cowgil soils are very deep and occur on fan piedmont remnants. They are very gravelly and moderately coarse textured on the surface layer, very gravelly and moderately fined textured in the subsoil, and very cobbly and coarse textured in the substratum. Cassiro soils are very deep and occur on fan piedmont remnants. They are stony and medium textured in the surface layer and very gravelly and fine textured in the subsoil. Yody soils are moderately deep over a duripan. They occur on fan piedmont remnants, are gravelly and moderately coarse textured in the surface layer, and gravelly and moderately fine textured in the subsoil and underlain by a duripan. Land use on this soil unit is mainly livestock grazing and rangeland wildlife habitat (NRCS, 1998).

The **Pookaloo-Hyzen-Cavehill** unit consists of well-drained soils that range from very shallow to moderately deep that occur on moderately steep to very steep terrains on mountain sides. This unit is mainly mapped in the Egan Range. Pookaloo soils, in particular, are shallow, and occur on steep to very steep mountain slopes. Their texture is very gravelly and underlain by shallow bedrock. Hyzen soils are also very shallow and occur on steep to very steep mountain slopes. They, too, are underlain by shallow bedrock but have a more coarse, extremely stony texture, compared to Pookaloo soils. Cavehill soils are moderately deep and occur on less (moderately) steep to steep side slopes. Their texture is very gravelly in the surface layer and very gravelly to very cobbly in the subsoil. Land use on this soil unit is mainly woodland, livestock grazing, and wildlife habitat (NRCS, 1998).

3.2.3 Minerals

Steptoe Valley contains ten mining districts, which are summarized in Table 3.2-1. Seven of these mining districts are in the immediate vicinity of the Station project area and are shown on Figure 3.2-3. The Nevada, Taylor, and Ward Mining Districts are outside the immediate vicinity of the Station project area and, therefore, are not shown on Figure 3.2-3. None of these ten districts coincides with the proposed sites for the power plants, wellfields, access roads, or rail spurs for either the Station Proposed Action or Alternative 1.

The proposed transmission line ROW crosses a portion of three separate mining districts (see Figure 3.2-3: the Telegraph District, Hunter District, and Granite District). There are no active mines within these districts and no known active mining claims within the proposed transmission line ROW.

The presence and value of minerals under the power plant site of both the Station Proposed Action and Alternative 1 are unknown. Because one of these sites will be selected as the Preferred Alternative and sold by BLM to WPEA, a minerals report on the selected site will be included in the Final EIS.

Geothermal resources are known to exist within Steptoe Valley, particularly Monte Neva and Lackawana Hot Springs located on the west side of the valley. These springs are described in more detail in Section 3.4.2.5.2, *Geothermal Springs;* however, none have been developed for geothermal energy.

The potential for oil and gas leases and sand and gravel operations in Steptoe Valley is moderate to high. In addition, the potential for development of geothermal resources is considered moderate. There are no currently active leases for oil and gas or geothermal resources at the Station Proposed Action or Alternative 1 power plant sites. However, there are active leases for either oil or gas at the location of the proposed Thirtymile Substation (T18N/R61E).

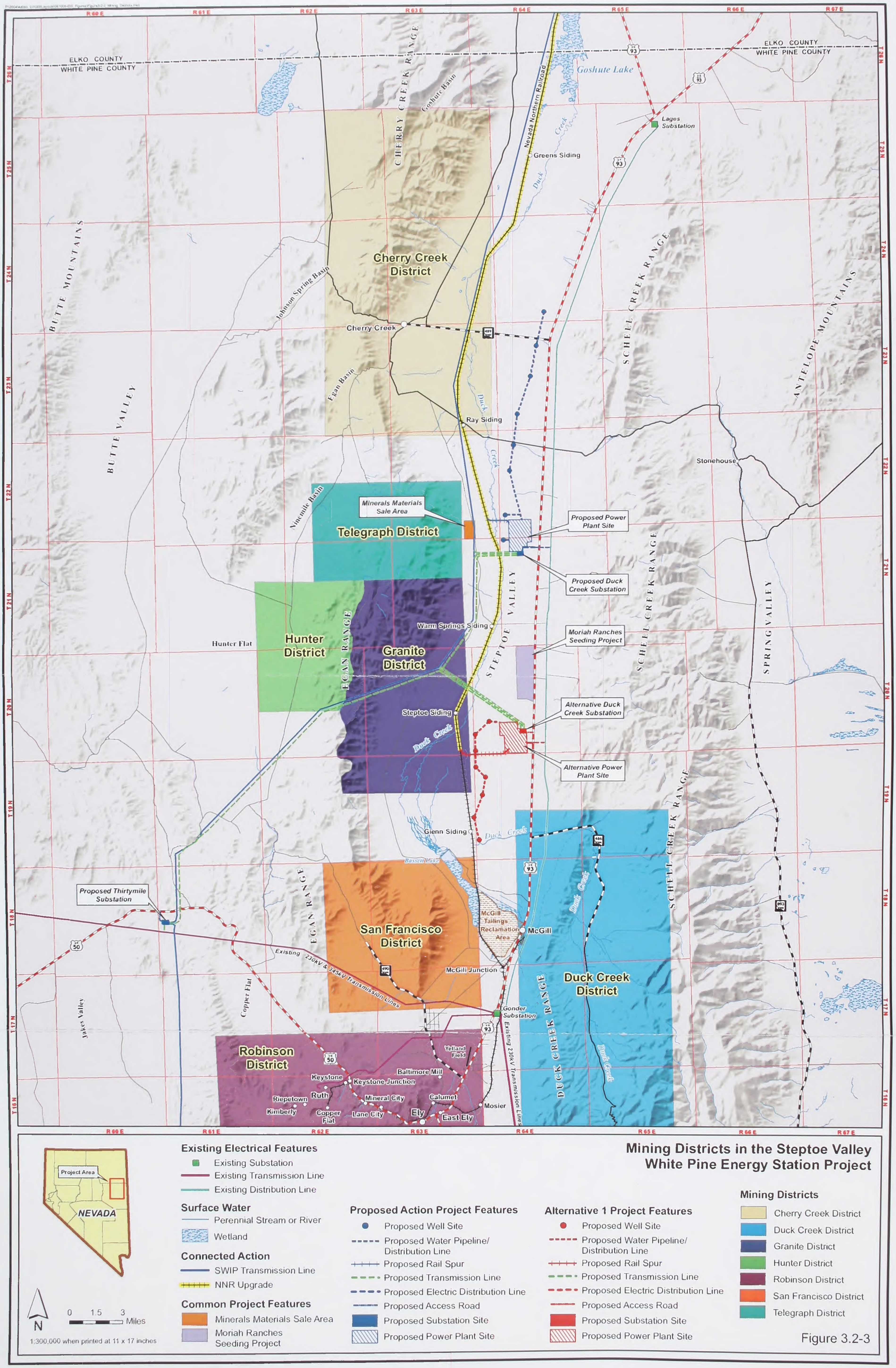
TABLE 3.2-1*

Mining Districts in Steptoe Valley

District Name	Mines	Status of Mine(s)	Primary Commodities
Cherry Creek District	Teacup (Biscuit) Mine	Not active	Silver, gold, lead, copper, zinc, tungsten, antimony, coal, fluorspar, beryllium
	Mary Ann Mine	Not active	
	Additional Mines: Chance, Only Chance, Fillmore (Scheelite King), Gypsy, Calcite, Happy, and Shoestring Mines.	Not active	
Telegraph District	No current mines exist in the Telegraph District	None present	Gold, tungsten
Hunter District	Hunter Lead-Copper-Silver Mine (formerly known as the Vulcan Mine)	Not active	Lead, copper, silver, gold, uranium
Granite District	Cuba Lead-Silver Mine	Not active	Lead, silver, gold, tungsten, copper
	Stinson Gold Mine		
	Valley View Mine		
San Francisco District	Mammoth, Confidence, Ida, Empire, Hercules, and Excelsior Claims	Not active	Silver, lead
Duck Creek District	Success Mine	Not active	Lead, silver, copper, zinc, gold, limestone, fire clay
	Cuba Mine	Not active	
Nevada District	Steptoe Group Mine	Not active	Manganese, silver, gold, lead, copper
	Argus Mill Mine site (Comins Lake) Monitor Mill Mine site (Steptoe Creek)	Not active	
	Vietti Mine	Not active	
Robinson District	Wedge Pit (proposed)	Not active	Copper. Other commodities include: gold, silver, zinc, lead, iron, manganese, tungsten, molybdenum, rhenium, platinum, palladium, nickel
	Kimbley Pit	Not active	
	Ruth Mine	Not active	
	Ruth Pit	Active	
	Deep Ruth Mine (proposed)	Not active	
	Morris-Brooks Pit	Not active	
	Tripp Pit	Not active	
	Tripp-Veteran Pit	Not active	
Taylor District	Monitor Mine	Not active	Silver, lead, antimony, copper, zinc, gold, arsenic
	Enterprise Mine	Not active	
	Argus Mine	Not active	
	Alameda Mine	Not active	
	Bishop Mine	Not active	
Ward District	Ward Mine	Not active	Silver, lead, zinc, copper and gold

Source: Nevada Bureau of Mines and Geology, 1998

*Seven of these mining districts are in the immediate vicinity of the Station project area and are shown on Figure 3.2-3. The Nevada, Taylor, and Ward Mining Districts are outside the immediate vicinity of the Station project area and, therefore, are not shown on Figure 3.2-3.



Mining Districts in the Steptoe Valley
White Pine Energy Station Project

Figure 3.2-3

3.3 Surface Water Resources

This section provides context for the evaluation of potential project-induced environmental consequences to surface water resources.

3.3.1 Hydrologic Setting

For the purpose of hydrologic analysis and water resources planning and management, the USGS and the Nevada Division of Water Resources, Department of Conservation and Natural Resources, have divided the State of Nevada into 14 distinct and discrete hydrographic regions. A hydrographic region is broadly defined as a geographic area drained by a single major stream (Nevada Division of Water Resources, 2006).

These hydrographic regions have been further segregated into 232 distinct hydrographic areas in Nevada that typically coincide with a single topographically defined basin or watershed. All components of the White Pine Energy Station Proposed Action and Alternative 1 would be located within the Central Hydrographic Region, and within three separate hydrographic areas: Steptoe Valley, Butte Valley, and Jakes Valley. Specifically, the Proposed Action and Alternative 1 power plants would be located within the Steptoe Valley Hydrographic Area, while the transmission line would extend beyond Steptoe Valley across the southern tip of Butte Valley and just into the northern end of Jakes Valley (see Figure 3.3-1).

3.3.2 Local Climate

The local climate is influenced by topography and is, therefore, quite variable across the Steptoe Valley Hydrographic Area. Across the basin, precipitation falls as both rain and snow. In the higher elevations of the flanking Schell Creek and Egan Ranges, where elevations exceed 10,000 feet above mean sea level, the climate is alpine and precipitation averages over 20 inches per year. Locally, precipitation may average over 30 inches per year (Eakin et al., 1967). Conversely, on the valley floor conditions are more arid. Ely Airport, at an elevation of 6257 feet, averages 9.52 inches of precipitation annually. McGill, at a slightly higher elevation of 6,340 feet, has an average annual precipitation of 8.79 inches.

Monthly averages of temperature and precipitation for both Ely and McGill are summarized in Table 3.3-1. These data indicate similar conditions at roughly the same elevation approximately 13 miles apart, and these conditions are considered to be representative of the Proposed Action and Alternative 1 feature sites. The considerable variation in seasonal temperatures on the valley floor is reflected in the more than 40 degrees Fahrenheit (°F) swing in average monthly maximum temperatures between January and July at Ely Airport and McGill. Precipitation is more constant from month to month with the lowest amounts falling in November and December (monthly averages ranging from 0.55 inch [McGill] to 0.68 inch [Ely Airport]) and highest in April and May (monthly averages ranging from 0.7 inch [McGill] to 1.1 inches [Ely]).

TABLE 3.3-1

Average Monthly Climatic Data Ely and McGill, Nevada

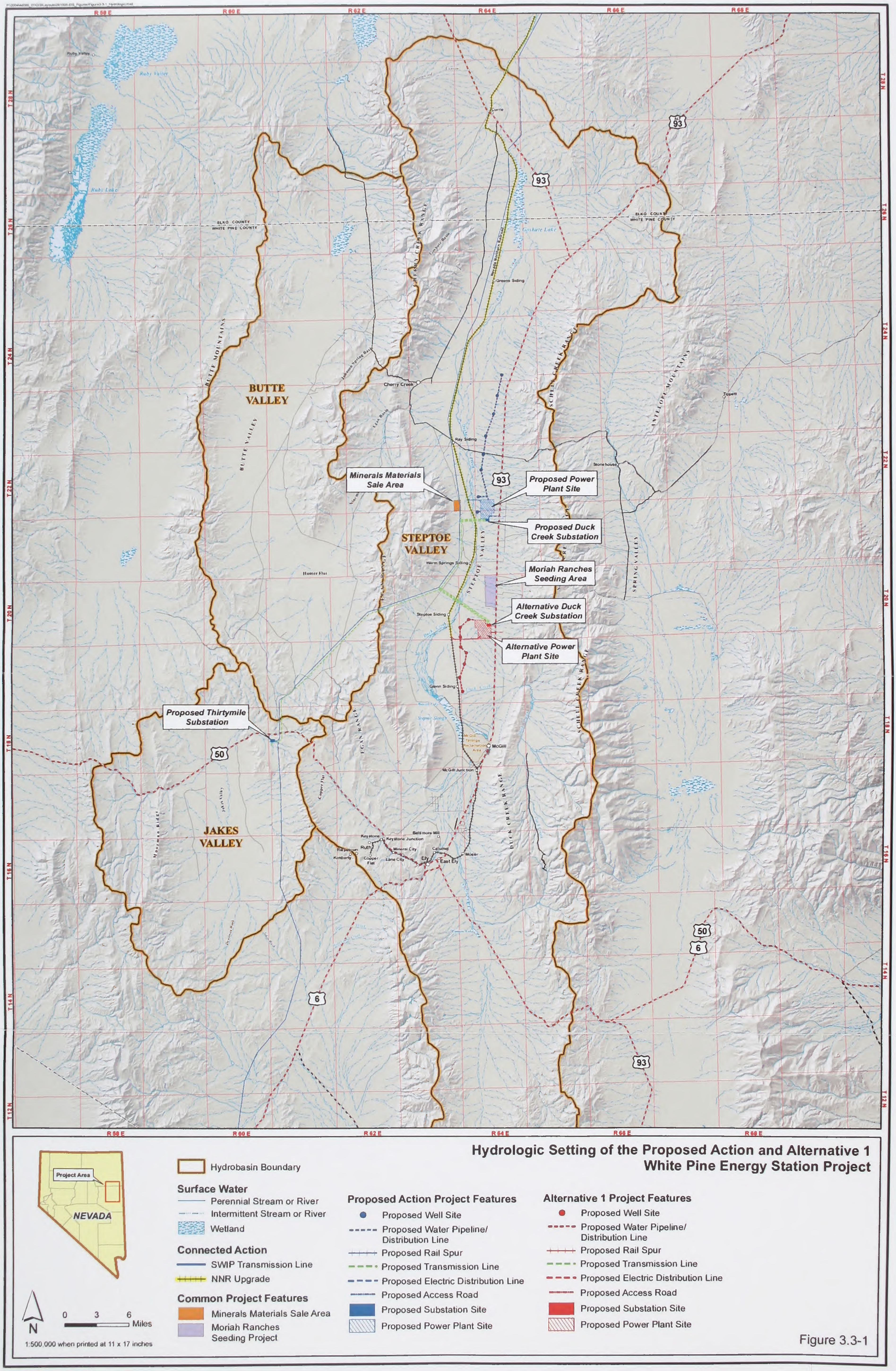
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ely, Nevada [a]													
Average Maximum Temperature (°F)	39.1	42.2	48.5	57.4	67.3	78.1	87.1	84.6	75.7	63.0	49.0	40.7	61.1
Average Minimum Temperature (°F)	10.5	15.0	20.7	26.8	33.8	40.5	48.1	46.9	37.5	28.3	18.9	11.9	28.2
Average Total Precipitation (inches)	0.75	0.72	0.96	1.01	1.09	0.70	0.59	0.81	0.75	0.84	0.68	0.62	9.52
Average Total Snowfall (inches)	8.8	7.3	8.9	6.2	2.7	0.1	0.0	0.0	0.3	2.5	5.3	7.9	50.1
Average Monthly Climatic Data McGill, Nevada (264950) [b]													
Average Maximum Temperature (°F)	39.0	42.4	49.0	57.4	67.4	77.9	86.7	84.6	76.1	63.8	49.7	41.1	61.3
Average Minimum Temperature (°F)	15.7	19.3	24.4	30.9	38.6	47.0	55.2	53.3	43.9	33.8	23.9	17.4	33.6
Average Total Precipitation (inches)	0.62	0.63	0.70	0.95	1.03	0.80	0.66	0.79	0.71	0.79	0.55	0.57	8.79
Average Total Snowfall (inches)	4.0	4.3	3.3	2.0	0.3	0.1	0.0	0.0	0.0	0.5	1.6	3.1	19.2

[a] Period of Record: 1/1/1897 to 9/30/2004
[b] Period of Record: 1/1/1914 to 9/30/2004
Source: http://www.wrcc.dri.edu/summary/climsmnv.html

These average values, however, do not reflect the timing or amounts of the most extreme precipitation events. Specifically, the highest monthly precipitation total on record at Ely Airport is 4.99 inches in June 1982, the same month in which the highest 24-hour precipitation total was recorded (2.87 inches) (Federal Emergency Management Agency, 1983). These and other locally heavy short-duration events have led to local flooding in the Ely area, as have periods of high spring snowmelt runoff. Historically, however, winter rain storms have not usually caused local flooding. For the water year between October 1, 2004, and October 1, 2005, the annual precipitation of 13.82 inches recorded at the Ely airport was approximately 45 percent above the annual average.

3.3.3 Surface Water Features

Surface water features in Steptoe Valley consist of the various streams and creeks that drain the surrounding mountains, two small lakes (Comins and Bassett Lakes), and the ephemeral Goshute Lake, which is a playa or “dry” lake. These features are shown in Figure 3.3-1.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R 68 E
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T 24 N
T 22 N
T 20 N
T 18 N
T 16 N
T 14 N
T 12 N
Ruby Valley
Ruby Lake
ELKO COUNTY
WHITE PINE COUNTY
BUTTE MOUNTAINS
BUTTE VALLEY
Cherry Creek
Goshute Lake
Greens Siding
Ray Siding
93
50
6
Tippett
ANTELOPE MOUNTAINS
SCHELL CREEK RANGE
SPRING VALLEY
Stone house
Minerals Materials Sale Area
Proposed Power Plant Site
Proposed Duck Creek Substation
STEPTOE VALLEY
Warm Springs Siding
Hunter Flat
Moriah Ranches Seeding Area
Alternative Duck Creek Substation
Alternative Power Plant Site
Steptoe Siding
Gavin Siding
EGAN RANGE
McGill
McGill Junction
DUCK CREEK RANGE
Proposed Thirtymile Substation
JAKES VALLEY
Keystone
Keystone Junction
Bellimore Mill
Ruth
Mineral City
Kimberly
Copper Flat
Lane City
Ely
East Ely
Moxier
Steptoe City
Hydrologic Setting of the Proposed Action and Alternative 1
White Pine Energy Station Project
Project Area
NEVADA
Hydrobasin Boundary
Surface Water
Perennial Stream or River
Intermittent Stream or River
Wetland
Connected Action
SWIP Transmission Line
NNR Upgrade
Common Project Features
Minerals Materials Sale Area
Moriah Ranches Seeding Project
Proposed Action Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Alternative 1 Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
N
0 3 6 Miles
1:500,000 when printed at 11 x 17 inches

Figure 3.3-1

3.3.3.1 Streams

The principal streams in Steptoe Valley originate in the higher mountains surrounding the valley (the Egan Range, Schell Creek Range and Cherry Creek Mountains), and are identified in Figure 3.3-1. Of these streams, only two, Duck Creek and Steptoe Creek, flow perennially onto the valley floor. Other streams in the basin only reach the valley floor when runoff from either snowmelt or precipitation is sufficiently high. The remainder of the time, either the sources of these smaller streams naturally cease to flow, and/or the streams terminate where and when they infiltrate into their stream beds upon leaving the mountain canyons. The source of many of the streams is spring discharge in the higher mountains that flank the valley to the east and west.

While many of the springs may flow perennially, their discharge alone is not high enough to sustain flow for any appreciable distance onto the valley floor (see Section 3.4.2.5, *Ground Water Discharge from Steptoe Valley*).

Although no significant streams flow from the relatively low lying hills that rim the northeastern portion of the basin (for example, the Antelope Range, Currie Hills), the ephemeral Nelson Creek drains the area north of the settlement of Currie toward Goshute Valley. A topographic divide within the Steptoe Valley Hydrographic Area near Currie enables surface water north of this divide to flow via Nelson Creek into the Goshute Valley Hydrographic Area (see Figure 3.3-2). However, both sides of this divide are enclosed basins with respect to surface water resources (surface water flows terminate at Goshute Lake south of the divide and within the Goshute Valley north of this divide).

The two largest streams in Steptoe Valley are Steptoe Creek and Duck Creek (see Figure 3.3-1). Steptoe Creek, which flows northward along the axis of the main valley primarily south of Ely, and its principal tributary, Cave Creek, both flow from the western flank of the Schell Creek Range. Data from a gauging station 0.8 mile upstream of the confluence with Cave Creek show that average annual flows in Steptoe Creek range from 2.8 to 18.8 cubic feet per second (cfs) (Table 3.3-2). Inasmuch as these values represent average annual flows, the range between the maximum and the minimum flows could vary considerably over a given year.

Typical of the streams on the valley floor, Steptoe Creek is considered to be a "losing" stream throughout its entire length. The source of water to the creek is runoff from precipitation rather than ground water. Water in Steptoe Creek is therefore continually "lost" to the subsurface as it infiltrates through the streambed. Clark and Riddell (1920) measured the decrease in flow with distance from the base of the mountains and reported that Steptoe Creek loses 0.27 cfs per mile across the valley. More recent studies in this regard are not known to have been conducted. Flow in Steptoe Creek typically terminates north of the Ely airport; however, during wet years it has been known to flow as far north as the Bassett Lake area and actually flow into Duck Creek during very wet years (Frick, 1985). Streams that receive inflow from ground water are referred to as "gaining" streams. Such streams, which are not known to occur on the floor of Steptoe Valley, are therefore perennial throughout their length because they are sustained by a base level of ground water discharge.

TABLE 3.3-2

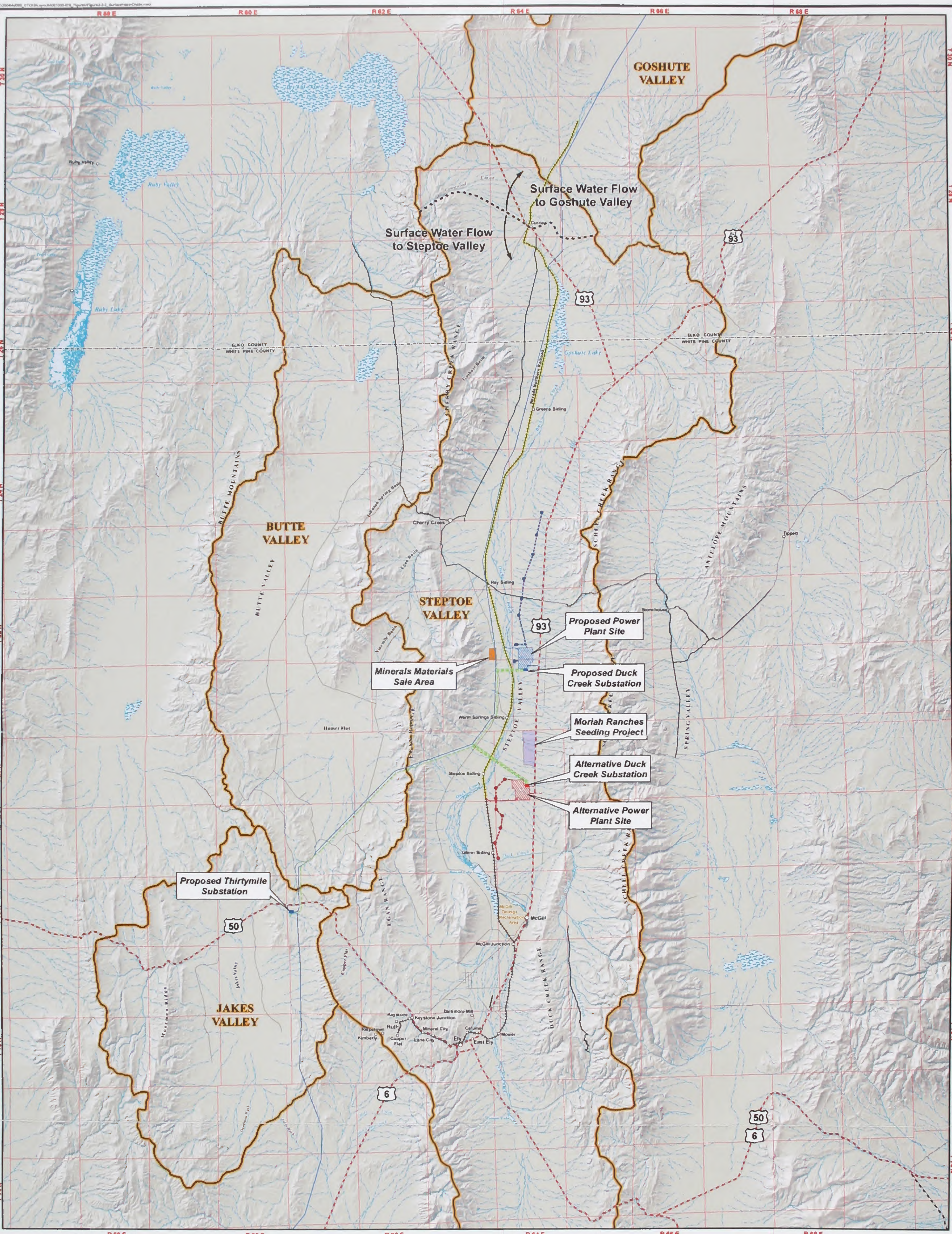
Average Annual Flow in Steptoe Creek 1966 -2002

Year	Average Discharge (cfs)	Year	Average Discharge (cfs)
1966	2.9	1985	8.1
1967	8.1	1986	9.6
1968	6.1	1987	5.3
1969	11.0	1988	5.4
1970	5.0	1989	3.3
1971	7.9	1990	2.8
1972	4.8	1991	3.6
1973	9.1	1992	2.8
1974	4.8	1993	5.7
1975	9.0	1994	3.3
1976	4.6	1995	10.0
1977	3.7	1996	4.3
1978	9.4	1997	5.0
1979	6.6	1998	9.5
1980	9.4	1999	6.5
1981	5.6	2000	4.2
1982	9.3	2001	4.2
1983	18.8	2002	2.8
1984	13.1		

Source: Savard and Cromption (1993); Waterdata.usgs.gov/nv/nwis/discharge (2 May 2005)
Location: 0.1 mile downstream of Clear Creek; 0.8 mile upstream from Cave Creek; 11 miles east of Ely.
Latitude: 39.1205, Longitude: 114.4115

The principal stream in the vicinity of the Proposed Action and Alternative 1 power plant sites is Duck Creek, which originates in Duck Creek Valley east of the Duck Creek Range in the east central part of the basin (see Figure 3.3-1). The principal tributaries to Duck Creek drain the Schell Creek Range east of Duck Creek Valley, and include Berry Creek, Timber Creek, Bird Creek, East Creek, and North Creek. Historically, Duck Creek was the principal source of water for the Town of McGill and the smelter that operated in that town.

Currently, water from Duck Creek continues to be used for dust mitigation on the tailings piles located immediately west of McGill. The water is conveyed to these piles via a 32-inch pipeline, which originates at a small reservoir located on Duck Creek near the confluence with Bird Creek. Flows through this pipeline have been reported to be consistently around 12 to 13 cfs throughout the year (Frick, 1985). However, these values of flow through the pipeline do not represent high runoff conditions when portions of the flow bypass the pipeline intake. Under these conditions of higher flow, the water in Duck Creek follows its natural channel through Gallagher Gap and



Location of Surface Water Divide Within Steptoe Hydrographic Region White Pine Energy Station Project

Project Area
NEVADA

N

0 3 6 Miles

1:500,000 when printed at 11 x 17 inches

Surface Water Divide

Hydrobasin Boundary

Surface Water

Perennial Stream or River

Intermittent Stream or River

Wetland

Connected Action

SWIP Transmission Line

NNR Upgrade

Common Project Features

Minerals Materials Sale Area

Moriah Ranches Seeding Project

Proposed Action Project Features

Proposed Well Site

Proposed Water Pipeline/ Distribution Line

Proposed Rail Spur

Proposed Transmission Line

Proposed Electric Distribution Line

Proposed Access Road

Proposed Substation Site

Proposed Power Plant Site

Alternative 1 Project Features

Proposed Well Site

Proposed Water Pipeline/ Distribution Line

Proposed Rail Spur

Proposed Transmission Line

Proposed Electric Distribution Line

Proposed Access Road

Proposed Substation Site

Proposed Power Plant Site

Figure 3.3-2

then divides into several channels before typically infiltrating into the large alluvial fan north of McGill. During extremely high flows, this reach of Duck Creek has been known to reach Bassett Lake. Bassett Lake gives new life to Duck Creek, which reappears as outflow from the lake and subsequently meanders along the central axis of the valley. Like Steptoe Creek, Duck Creek continually loses water through infiltration as it flows across the valley floor. During normal to dry years, the flow in Duck Creek is too low to sustain flow north of Cherry Creek Road throughout the year (Frick, 1985). The only data from a gauging station 8 miles southeast of Cherry Creek are presented in Table 3.3-3. While the data in this table indicate that the average flow is over 40 cfs, this average takes into account high flows of over 100 cfs, which occurred in February and March, and low flows of less than 1 cfs, which occurred in July and August during these particular years. The implication is that even when flows in Duck Creek were as high as 130 cfs in the spring, by summer the flows were very low (less than 1 cfs) at the same location, which is at least 20 miles upstream of Goshute Lake. In addition, during the preparation of this document, no flow was observed to be present in Duck Creek at the gauging station 8 miles south of Cherry Creek on 9 August, 2005. This observation was noted during a year when the annual precipitation at Ely in 2005 was 45 percent higher than normal (see Section 3.3.2).

A few small ephemeral creeks run through the footprints of the Proposed Action and Alternative 1 power plant sites. Specifically, Whiteman Creek flows through the Proposed Action site, and First Creek and the Kinsey Canyon drainage flow through the Alternative 1 power plant site. All of these creeks originate from the Schell Creek Range, but only convey water seasonally for short durations in wet years, and typically do not carry water all the way to Duck Creek. Additionally, all surface drainage from the Proposed Action and Alternative 1 power plant sites flows toward Duck Creek; however, unless the source of water is considerable, surface drainage from these sites will infiltrate prior to reaching Duck Creek.

The route of the proposed water pipeline linking the Proposed Action well field to the Proposed Action power plant site crosses the ephemeral drainages of Whiteman Creek, Tehama Creek, and Schell Creek, and numerous other unnamed ephemeral washes that originate on the eastern side of the basin. The proposed water pipeline linking the Alternative 1 well field to the Alternative 1 power plant site does not cross any specifically identified surface water drainages, either named or unnamed.

TABLE 3.3-3
Duck Creek Discharge South of Cherry Creek Road

Water Year (October-September)	Discharge (cfs) Mean	Maximum	Minimum
1986	45.1	130	0.7
1987	44.9	115	1.6

Source: Savard and Crompton (1993)
Location: 8 miles south of Cherry Creek; Latitude = 39.4815; Longitude = 114.3804 (only data available)

Section 3.5.1.1.10, *Wetlands,* discusses drainages within the Station project area that are potentially under the jurisdiction of the U.S. Army Corps of Engineers as "waters of the United States" and "other potential waters of the United States."

3.3.3.2 Lakes

Within the Steptoe Valley Hydrographic Area there are three principal lake features: Comins Lake, Bassett Lake, and Goshute Lake (see Figure 3.3-1). Comins Lake is primarily spring fed, but also receives water from local small creeks. Bassett Lake, which is a man-made feature, is principally fed by runoff from the dust mitigation irrigation system on the tailings piles west of McGill. In addition, Bassett Lake receives inflow from springs and periodically receives water from Duck Creek and Steptoe Creek during high runoff periods. Goshute Lake is a playa, or "dry" lake, that receives discharge from a few local springs, adjacent ephemeral creeks, and water from Duck Creek during high flow periods.

3.3.4 Flood Plain Delineation

Floodplain delineations have not been mapped in Steptoe Valley north of Ely. The Federal Emergency Management Agency classifies unmapped areas as being Zone D, which is defined as an area of undetermined, but possible, flood hazard (Map Index Community Panel Numbers 3200220925 and 3200220725). Consequently, the components of the White Pine Energy Station Proposed Action and Alternative 1 sites are not located within a specified floodplain.

3.3.5 Water Quality

No water quality data are known to be available for Duck Creek. Data from other streams in Steptoe Valley indicate that the surface water quality is characterized by moderate concentrations (less than 400 milligrams per liter of total dissolved solids (Eakin et al., 1967), and a chemical composition of mainly calcium and magnesium bicarbonate. The total dissolved solids concentrations are typically influenced by the flow rate of the streams (total dissolved solids concentrations decrease when flow rate increases and tend to increase during times of low flow). When and where its flow ceases, Duck Creek is reduced to small pockets or isolated pools of standing water based on observations made during the preparation of this document. These small isolated pools of standing water are likely to become progressively more concentrated in total dissolved solids during the course of a given year as their volume is reduced through evaporation. Furthermore, inasmuch as livestock ranching is common along and adjacent to much of Duck Creek along the bottom of Steptoe Valley, the water quality of Duck Creek is heavily influenced by cattle grazing adjacent to and/or within Duck Creek.

3.4 Ground Water Resources

This section provides context for the evaluation of potential environmental consequences as a result of pumping local ground water resources in Steptoe Valley to meet the water demand for the proposed White Pine Energy Station.

3.4.1 Regional Conditions and Basic Concepts

The proposed Station is located within the Basin and Range Physiographic Province, a name that refers to the general pattern of alternating valleys (basins) and mountain ranges that characterize the landscape of the southwestern United States (see Section 3.2, *Geology, Soils, and Mineral Resources*).

Within the Basin and Range Province, ground water occurs within two different subsurface geologic environments: 1) the sediments that have filled the basins to their current elevations (basin-fill deposits), and 2) the rock, where sufficiently fractured, that underlies these sediments and comprises the surrounding mountains.

3.4.1.1 Ground Water within the Basin-Fill Deposits

The basin-fill deposits consist of unconsolidated sediments (for example, gravel, sand, silt, and clay), which are produced by the erosion of the mountains and hills that surround the valleys. Streams and creeks flow from the mountains transporting, and eventually depositing, these sediments within the adjacent valleys. The resulting basin-fill deposits are, therefore, typically discontinuous layers of sand and gravel mixtures that alternate with layers of silt and clay mixtures.

The relative abundance of coarse- or fine-grained sediments at a given location within these basin-fill deposits depends on the physical conditions at the time these sediments were deposited. Coarse-grained sediments, such as sand and gravel, require more energy to transport relative to fine-grained silt and clay. Accordingly, coarser sediments are found in those areas where past stream flows were relatively high: for example, adjacent to the mountain fronts or along the banks of the larger streams. Conversely, with smaller creeks, or where the flows in larger streams slowed as they entered the flatter valley floor from the adjacent mountains, less energy is available for sediment transport resulting in deposits of finer-textured silt and clay.

Coarser sediments are better at storing and conveying ground water through the subsurface and yielding water to wells. When saturated, layers of coarser sediments are referred to as aquifers. The interbedded layers of finer-textured silt and clay tend to be relatively impermeable and act to confine deeper basin-fill aquifers under pressure.

Ground water in basin-fill aquifers generally flows in directions that coincide with decreasing ground surface elevations ("downhill"). Basin-fill aquifers, which are the principal source of water to wells in the Basin and Range Province, are typically localized within the boundaries of a given basin. However, where basin-fill deposits of two adjacent basins merge, ground water can flow between basins within aquifers that are common to both basins.

3.4.1.2 Fractured-Rock Ground Water Systems

In addition to the basin-fill deposits, the rock that underlies these sediments can also be considered as an aquifer and store and convey ground water where the rock is sufficiently fractured. Because the fractured-rock aquifers typically underlie the basin-fill deposits, ground water in fractured rock is deeper and represents regional aquifer systems where ground water flows irrespective of the local topography and basin boundaries. Ground water in deep fractured-rock aquifers flows in response to regionally controlled hydraulic gradients that link regional recharge and discharge areas, and is generally not significantly influenced by conditions in the overlying basin-fill aquifers.

The most important regional fractured-rock aquifer in eastern Nevada coincides with the Carbonate Rock Province, which derives its name from the consistent presence of massive sequences of carbonate rocks (limestone and dolomite) that extend over a large area of present-day eastern Nevada, western Utah, and southwestern Idaho. The proposed Station is located within the Carbonate Rock Province, near its eastern boundary.

The carbonate rocks in this region are brittle and subject to fracturing. Under ideal geochemical conditions, these underlying rocks can dissolve and form cavities that further enhance the ability of the rock to store and transmit ground water.

3.4.2 Local Conditions

The physical components of the Station Proposed Action and Alternative 1 (for example, the power plant and associated infrastructure) would be located within three separate hydrographic areas as defined by the USGS and the Nevada Division of Water Resources (see Figure 3.3-1). Specifically, the Proposed Action and Alternative 1 power plant sites, rail spurs, well fields and associated water pipelines, and the initial segments (approximately 17 miles) of the high voltage transmission line easement would be located within the Steptoe Valley Hydrographic Area (Basin 179). The middle segments of the transmission line easement would cross approximately 15 miles of the Butte Valley Hydrographic Area (Basin 178), and approximately 2 miles of the remaining transmission line easement would cross into the northern part of the Jakes Valley Hydrographic Area (Basin 174).

Accordingly, this discussion of the ground water resources affected environment focuses on the Steptoe Valley Hydrographic Area. In addition to most of the physical components of the proposed Station being located in Steptoe Valley, the source of water to the Proposed Action and Alternative 1 well fields is ground water that naturally originates and discharges through the basin-fill deposits of Steptoe Valley.

3.4.2.1 Steptoe Valley Physical Setting

Elongated in a generally north-south direction, Steptoe Valley is sandwiched between the Schell Creek and Duck Creek Ranges to the east and the Cherry Creek and Egan Ranges to the west (see Figure 3.3-1). The ridges of these east and west flanking mountains generally rise between 3,000 and 5,000 feet above the valley floor, with the elevations of highest peaks in each of the four principal ranges exceeding 10,000 feet above mean sea level. North Schell Peak, which is located immediately southeast of McGill at an elevation of over 11,880 feet, is the highest point within the hydrographic area.

To the north, the boundary between the Steptoe Valley and Goshute Valley Hydrographic Areas consists of a series of northwest-southeast trending hills including Boone Spring Hills, Antelope Range, Currie Hills, and the Palomino Ridge (see Figure 3.3-1). These hills, which rise no more than 1,500 feet above the valley floor, are relatively low compared with the mountains that flank the main valley to the east and west. Although the valley is essentially encircled by the surrounding hills and mountains, a narrow gap along Nelson Creek north of the settlement of Currie is not separated from surrounding basins by a topographic divide (see Section 3.3, *Surface Water Resources*).

The total area of the Steptoe Valley Hydrographic Area covers approximately 1,942 square miles. Stretching approximately 110 miles from north to south, it has a maximum width of only 28 miles. The floor of Steptoe Valley slopes generally toward Goshute Lake at the northern end of the valley. The highest elevation of the valley floor, therefore, occurs at the southernmost end where it is approximately 7,200 feet above sea level. Conversely, the lowest point of the valley floor is at an elevation of 5,740 feet along the northern boundary of the basin where the ephemeral Nelson Creek flows into Goshute Valley to the north (Frick, 1985) (see Section 3.3, *Surface Water Resources*).

3.4.2.2 Ground Water Movement and Storage Characteristics in Steptoe Valley

Ground water in Steptoe Valley is stored and conveyed principally through the saturated unconsolidated basin-fill deposits. Although regionally significant, the fractured-rock aquifer in the carbonate rocks, which directly underlie the basin-fill deposits in Steptoe Valley, does not directly yield ground water either to local wells or to the wells proposed for the Proposed Action or Alternative 1 (wells that withdraw ground water from the carbonate rocks in Steptoe Valley are not known to exist, and the wells proposed for either the Proposed Action or Alternative 1 would tap into ground water in the overlying basin-fill deposits and not in the deep carbonate rocks). Accordingly, this discussion and the subsequent impact analysis in Section 4.4, *Drinking Water Quality and Ground Water Resources,* focuses on ground water within the basin-fill aquifers of Steptoe Valley.

The underground movement and storage of ground water are defined by the hydraulic conductivity and storage coefficient of the aquifer. The implications of different values of these parameters are discussed in Section 4.4, *Ground Water Resources.* Hydraulic conductivity refers to the ability of geologic material to transmit water, and it is an important factor in determining: 1) the average linear rate, or velocity, of ground water flow; 2) the hydraulic gradient or "slope" of the water table; 3) the potential amount a well is capable of pumping (well yield); and 4) the resulting spatial pattern of ground water decline that results from pumping a well.

Values of hydraulic conductivity within the Steptoe Valley basin-fill aquifers vary primarily with depth as a result of alternating layers of coarse- and fine-textured sediments. In addition, values of hydraulic conductivity also tend to vary across the valley, with coarser (higher hydraulic conductivity) sediments located closer to the mountain fronts where past surface water flows have been high enough to transport larger-grained sediments (for example, sand and gravel). In Steptoe Valley, these coarser sediments occur where the two perennial creeks, Steptoe Creek and Duck Creek (see Section 3.3, *Surface Water Resources*), have flowed historically, and where ephemeral streams and creeks flowing from the surrounding highland areas enter the valley.

The other important aquifer parameter to understand for the impact analysis presented in Section 4.4, *Ground Water Resources,* is the storage coefficient. The storage coefficient of the aquifer is the volume of water that is stored within a given volume of the aquifer. This parameter is important in understanding the resulting spatial pattern of ground water decline that results from pumping a well, and whether or not the ground water in an aquifer is under pressure (whether the aquifer is considered to be "confined" or "unconfined"). Specifically, low values of storage coefficient (typically less than 0.001) indicate that ground water within an aquifer is confined under pressure, and that the water level in an associated well rises above the top of the aquifer. Higher values (typically greater than 0.001) signify that ground water is not confined under pressure and that the ground water surface forms a water table within the aquifer.

Values of hydraulic conductivity and specific yield in Steptoe Valley have been determined through a number of field measurements and have also been developed as a result of calibrating computer models of ground water flow in Steptoe Valley. The reported values of hydraulic conductivity and storage coefficient are summarized in Table 3.4-1. These values are representative of average conditions over variable depths within approximately 1,000 feet of the water table and do not necessarily represent conditions in the shallowest ground water within 50 feet of the ground water table. The data for storage coefficient in Table 3.4-1 suggest that ground water in the basin-fill deposits in Steptoe Valley is confined.

3.4.2.3 Local Ground Water Occurrence

Despite the data for storage coefficient in Table 3.4-1 that suggest all ground water in Steptoe Valley is confined under pressure, ground water likely occurs in both confined and unconfined aquifers within the basin-fill deposits in Steptoe Valley. Logs recording the geologic formations encountered in boreholes drilled in Steptoe Valley indicate that typical water-yielding deposits are layers of sand and gravel that range up to several hundred feet in thickness, but typically are on the order of approximately 20 feet thick. These water-yielding layers are confined by relatively impermeable layers of finer texture silt and clay that range from less than 5 feet to more than 100 feet in thickness. The specific nature and spatial variability of the local basin-fill aquifer units are illustrated through geologic logs of boreholes shown on Figures 3.4-1A and 3.4-1B for USGS wells 1, 2, and 3, and summarized in Table 3.4-2 for test wells 1A, 1B, and 1C. The locations of these boreholes are shown in Figure 3.4-2.

TABLE 3.4-1

Values of Hydraulic Conductivity and Storage Coefficient for Basin-Fill Aquifers in Steptoe Valley

Hydraulic Conductivity (feet/day)	Storage Coefficient	Source of Information
2.4 to 5.8	1.7×10^{-4} to 2.5×10^{-4}	Aquifer test, Steptoe Valley (Leeds, Hill, and Jewett, Inc., 1983)
5.8[a]	1.0×10^{-4} to 2.0×10^{-4}	Calibrated ground water model, Steptoe Valley (Leeds, Hill, and Jewett, Inc., 1983)
0.09 to 432	1.0×10^{-4} [b]	Calibrated ground water model, Steptoe Valley (Frick, 1985)

[a]This value is calculated from a value of aquifer transmissivity (T, where T = hydraulic conductivity times aquifer thickness) of 94,000 gallons per day per foot (gpd/ft) based on stated aquifer thickness of 2,180 feet (Leeds, Hill, and Jewett, Inc., 1983). This value was the highest for T used in the model. The lowest value of T used was 24,000 gpd/ft, but this lower value could not be converted to an equivalent value of hydraulic conductivity because a corresponding value of aquifer thickness is unknown.

[b]Assumed value used to calculate values of hydraulic conductivity from numerous pump and bailer tests using the method of Walton (1962) as reported by Frick (1985, page 93).

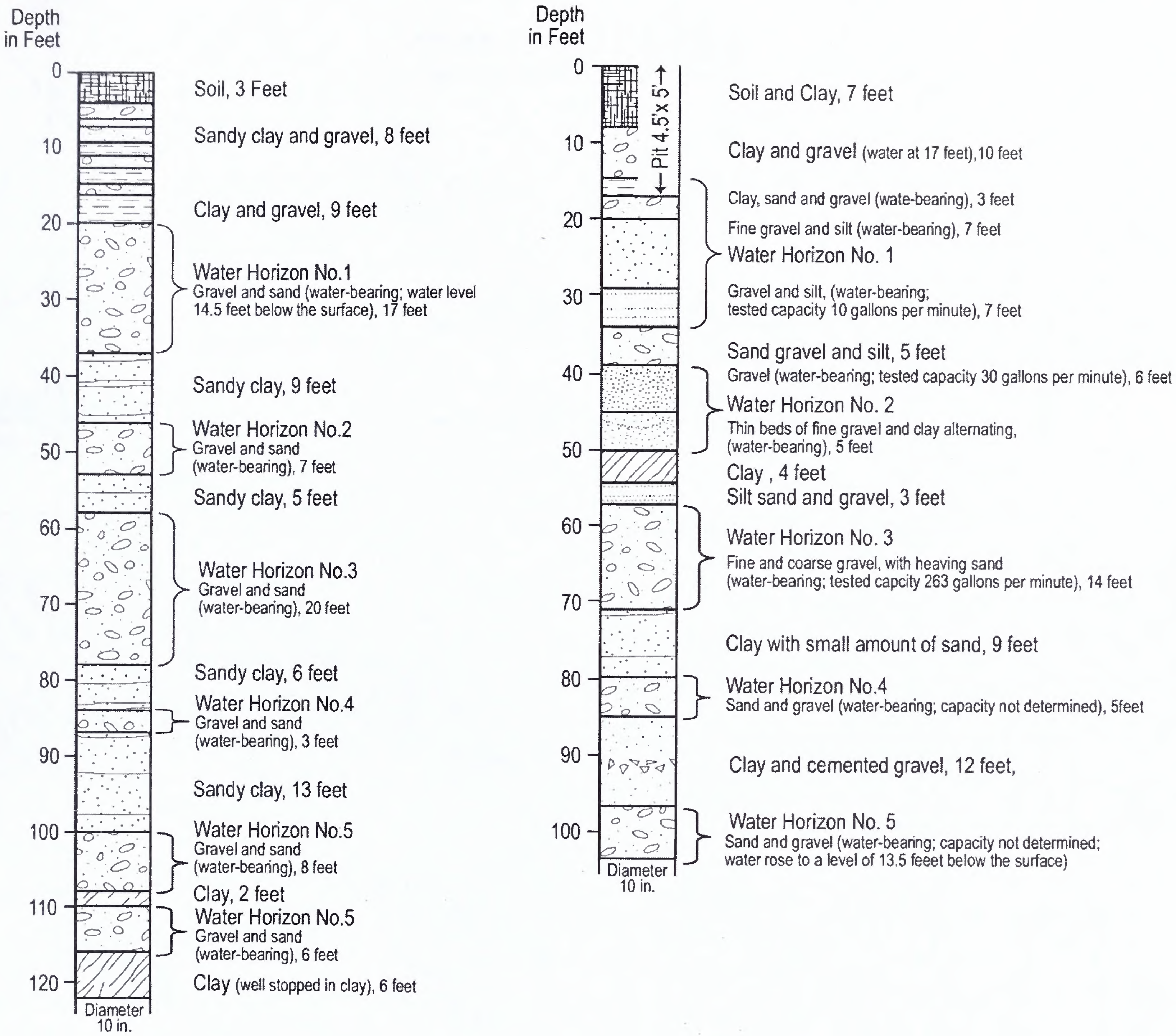


Figure 3.4-1A
Geologic Log of
USGS Steptoe Wells 1&3

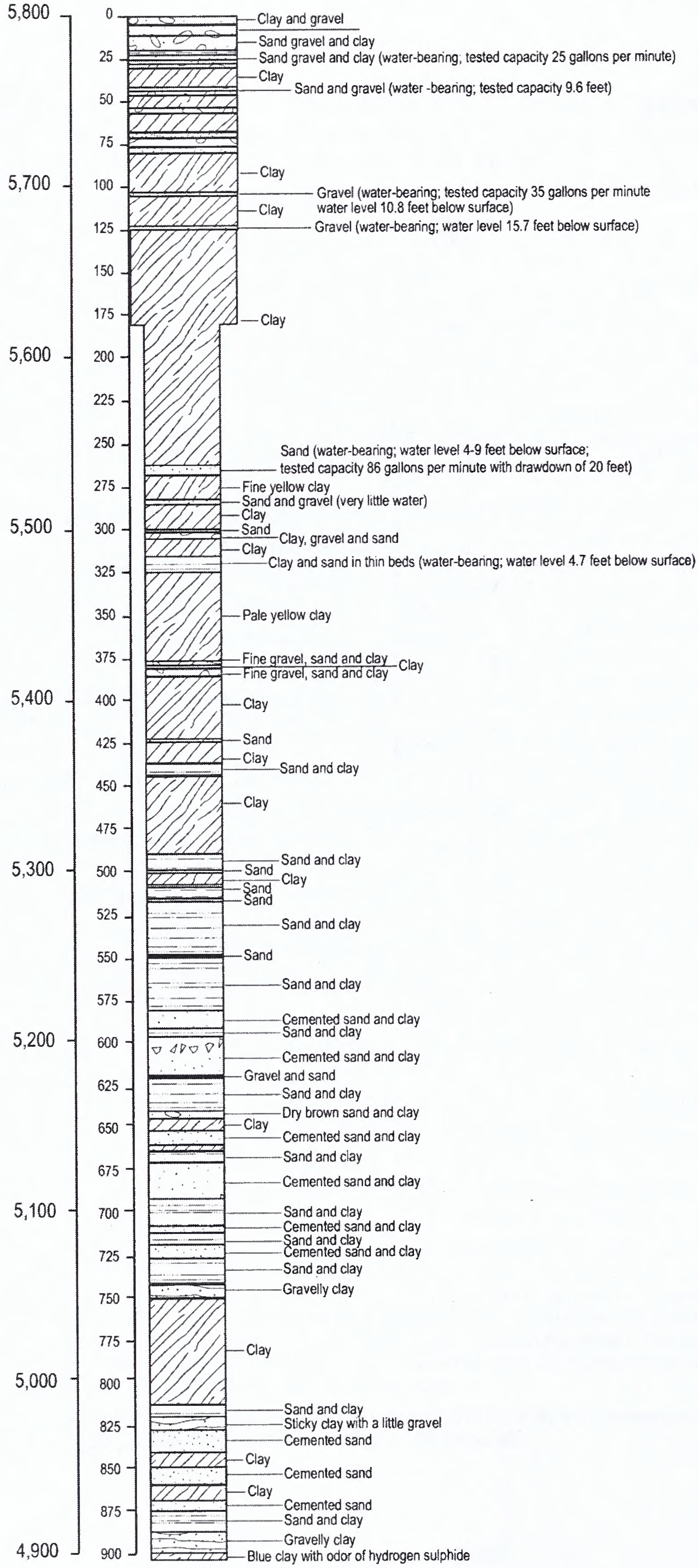
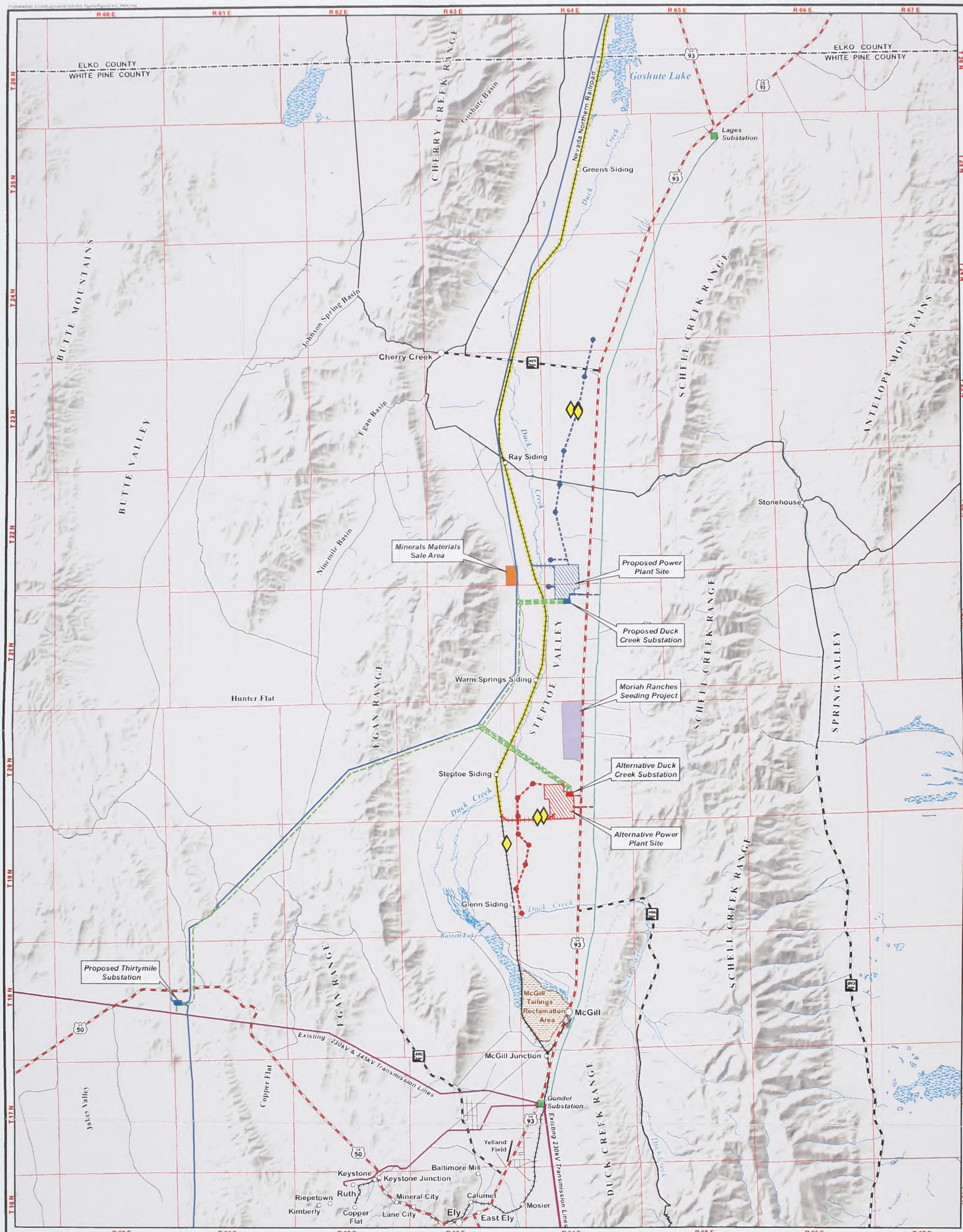


Figure 3.4-1B
Geologic Log of
USGS Steptoe Well 2



Location of Wells with Geologic Logs and Water Quality Data
White Pine Energy Station Project

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Well with Geologic Log

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Project Area
NEVADA

0 1.5 3 Miles
1:300,000 when printed at 11 x 17 inches

Figure 3.4-2

TABLE 3.4-2

General Geologic Description of Basin-Fill in Steptoe Valley

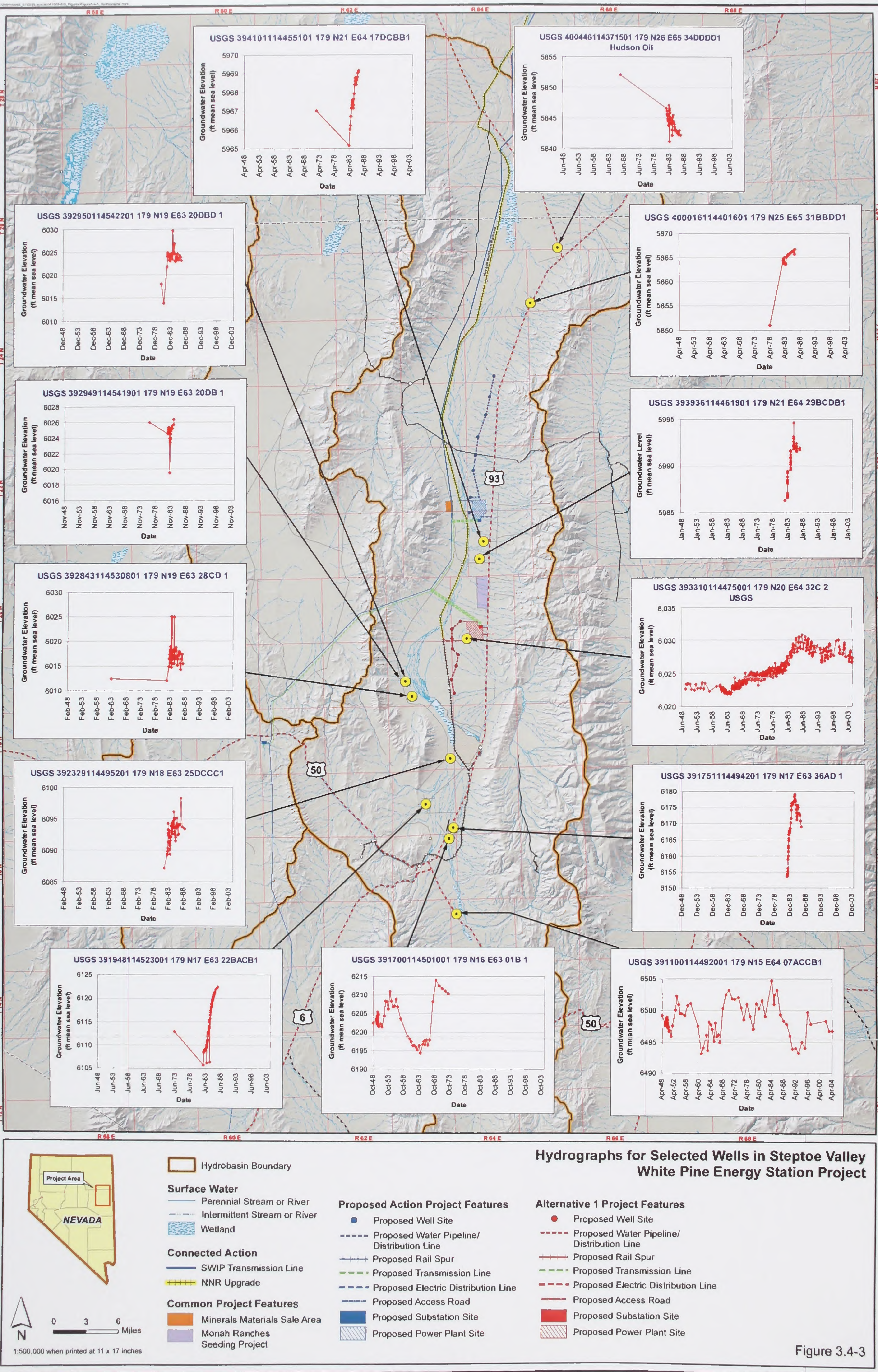
Well 1A[a]		Well 1B[b]		Well 1C[c]	
Depth Interval (feet below ground surface)	Geologic Description	Depth Interval (feet below ground surface)	Geologic Description	Depth Interval (feet below ground surface)	Geologic Description
0-110	Moderately to very silty sand and gravel	0-400	Silty to very silty sand and gravel layering. Clean sand and gravel layers at 160-170, and 230-245 feet below ground surface.	0-320	Silty sand and gravel. Clean sand and gravel layers at 115-120, 160-178, 208-215, and 225-245 feet below ground surface.
110-265	Zone of sand and gravel, interbedded with silt and minor amounts of clay. Fairly clean sand and gravel strata at 112-122, 160-195, 202-240, and 260-265 feet below ground surface	400-460	Clean coarse sand and gravel	320-455	Clean sand and gravel
265-360	Very silty sand				
360-675	Fairly clean gravel zone (includes cobble and boulder size rocks)				
675-995	Silty sand and gravel				

[a] Located approximately 2 miles southwest of the intersection of Cherry Creek Road and U.S. 93
[b] Located 924 feet west of Well 1A
[c] Located 250 feet south of Well 1A
Source: Leeds, Hill, and Jewett, Inc., 1983

As indicated by the geologic descriptions in these logs, there is considerable variability in the stratigraphy across the basin and even between locations that are less than 1,000 feet apart. These geologic descriptions also indicate that multiple water-yielding layers or zones are potentially present. Previous investigations have grouped these multiple water-yielding zones into two separate principal aquifer units (Leeds, Hill, and Jewett, Inc., 1983; Frick, 1985). The upper unit is relatively shallow (with a depth to the water table of less than 50 feet below the ground surface), and is not likely to be a reliable source of sustained yield to wells for all but individual residential use. The deeper unit is considerably thicker and confined under pressure, and is a more reliable source of ground water to wells. Accordingly, the wells for the Station would tap this deeper unit. The base of the basin-fill deposits within Steptoe Valley has been estimated to be more than 11,000 feet deep at a location northwest of McGill (Frick, 1985). Data from four petroleum exploration wells, ranging in depth between 3,900 and 7,030 feet below the ground surface within the valley, confirm that the thickness of the basin fill deposits is at least several thousand feet (Tumbusch and Schaefer, 1996). The tremendous thickness of these sediments implies that a considerable volume of ground water is stored within the basin. Typically, however, ground water wells in the valley are no deeper than 1,000 feet; therefore, much of the ground water in storage remains undeveloped. According to Eakin et al. (1967), the volume of ground water in storage within 100 feet of the water table over an area of 143,000 acres (approximately 223 square miles) is estimated to be approximate 2.1 million acre-feet. An acre-foot is the volume of water that covers an acre to a depth of 1 foot and is roughly equivalent to the average annual domestic water demand for two households (assuming four people per household; 100 gallons per day per person; Dunn and Leopold [1978]). The estimate by Eakin et al. (1967) is less than half of the estimate of 5 million acre-feet developed by the Nevada Department of Conservation and Natural Resources (1971), which reports the volume of ground water in storage within Steptoe Valley is 50,000 acre-feet per foot of aquifer thickness.

The depth to ground water below the ground surface is variable across the basin as indicated by the data in Table 3.4-3, with more variability on an annual basis typically seen in the shallower aquifer unit. In general, ground water is shallowest near the central axis of the valley adjacent to Duck Creek, and is typically deeper toward the valley margins adjacent to the mountain fronts. Shallow ground water tends to be more influenced by seasonal and annual fluctuations in precipitation and stream flow than deeper ground water, which tends to be more heavily influenced locally by the pumping of wells.

Hydrographs depicting the variability in ground water levels both annually and spatially across the basin are presented in Figure 3.4-3. In the center of the valley near the Alternative 1 site for the power plant, ground water levels from well N20 E64 32C2 typically fluctuate up or down between approximately 1 and 2 feet on an annual basis (see Figure 3.4-3).



Hydrographs for Selected Wells in Steptoe Valley
White Pine Energy Station Project

Figure 3.4-3

TABLE 3.4-3

Depth to Ground Water in Selected Wells in Steptoe Valley

Well Locator	Well ID	Well Depth (feet below ground surface)	Minimum Depth to Ground Water (feet)/Date	Maximum Depth to Ground Water (feet)/Date	Range (feet)	Period of Record
N15 E64 07A	Unnamed irrigation well	200	30.25 /June 1984	41.83 /March 1961	11.58	1948-1984
N19 E63 12BDAC	Boundy and Forman well 30W-A	915	11.84 /June 1985	19.41 /August 1983	7.57	1945-1984
N16 E63 01B	Unnamed well	--	55.91 /April 1969	76.10 /July 1965	20.19	1949-1973
N20 E64 32C2	USGS Steptoe monitoring well	110	7.47 /April 1985	17.87 /December 1946	10.4	1918-1984
N16 E64 DCBD	USGS East Ely monitoring well	306	224.24 /July 1985	270 /July 1951	46	1965-1985
N21 E64 29BCDB	Boundy and Forman well 28W-a	--	35.38 /May 1985	43.88 /March 1983	8.50	1983-1985
N17 E63 36 AD	Boundy and Forman well 3W	--	60.95 /May 1985	86.40 /December 1982	25.45	1983-1985
N17 E63 22BACB	Boundy and Forman well 4W	102	81.29 /June 1985	98.65 /July 1983	17.36	1983-1985
N18 E63 25DCCC	Boundy and Forman well 6W	130	1.86 /March 1985	11.4 /November 1981	9.5	1945-1985
N25 E65 31BA	Boundy and Forman well 22W-A	235	104.8 /August 1985	120 /April 1978	15	1978-1985
N26 E65 34DDDD	Boundy and Forman well 21W	327	45.0 /June 1967	55.9 /November 1983	10.9	1967-1985
N21 E64 17DCBB	USGS Big Indian monitoring well	300	58.14 /May 1985	61.82 /April 1983	3.68	1972-1985
N26 E65 34DABA	Boundy and Forman well 21W-A	894	54.03 /March 1984	158.31 /August 1983	104.28	1981-1985
N19 E63 28CD	Boundy and Forman well 7W	122	6.03 /March 1983	29.74 /August 1983	23.71	1963-1985
N19 E63 20DB	Boundy and Forman well 9W-A	200	13.6 /November 1984	69.07 /July 1983	55.5	1977-1985
N19 E63 20DBD	Boundy and Forman well 9W-B	175	3.06 /April 1985	43.90 /July 1983	40.84	1981-1985

Source: Frick (1985)

The most recent published map of ground water levels in Steptoe Valley was drawn in 1985 and is shown in Figure 3.4-4 (Bedinger et al., 1984). Ground water levels are likely to be generally higher today than in 1985 primarily because less ground water is currently being pumped (see Section 3.4.2.8, *Ground Water Use and Perennial Yield*). Although the specific elevations associated with the contours of ground water level likely differ somewhat today from 1985, the depiction of the ground water surface in Figure 3.4-4 remains a reasonable representation of current conditions because of the scale that the data are presented in the map. Based on the general pattern of ground water elevations shown in Figure 3.4-4, ground water in the basin-fill generally flows from the margins of the valley toward the center of the basin and then northward toward Goshute Lake, with some flow exiting the basin under the gap where Nelson Creek flows north into Goshute Valley.

3.4.2.4 Ground Water Recharge to Steptoe Valley

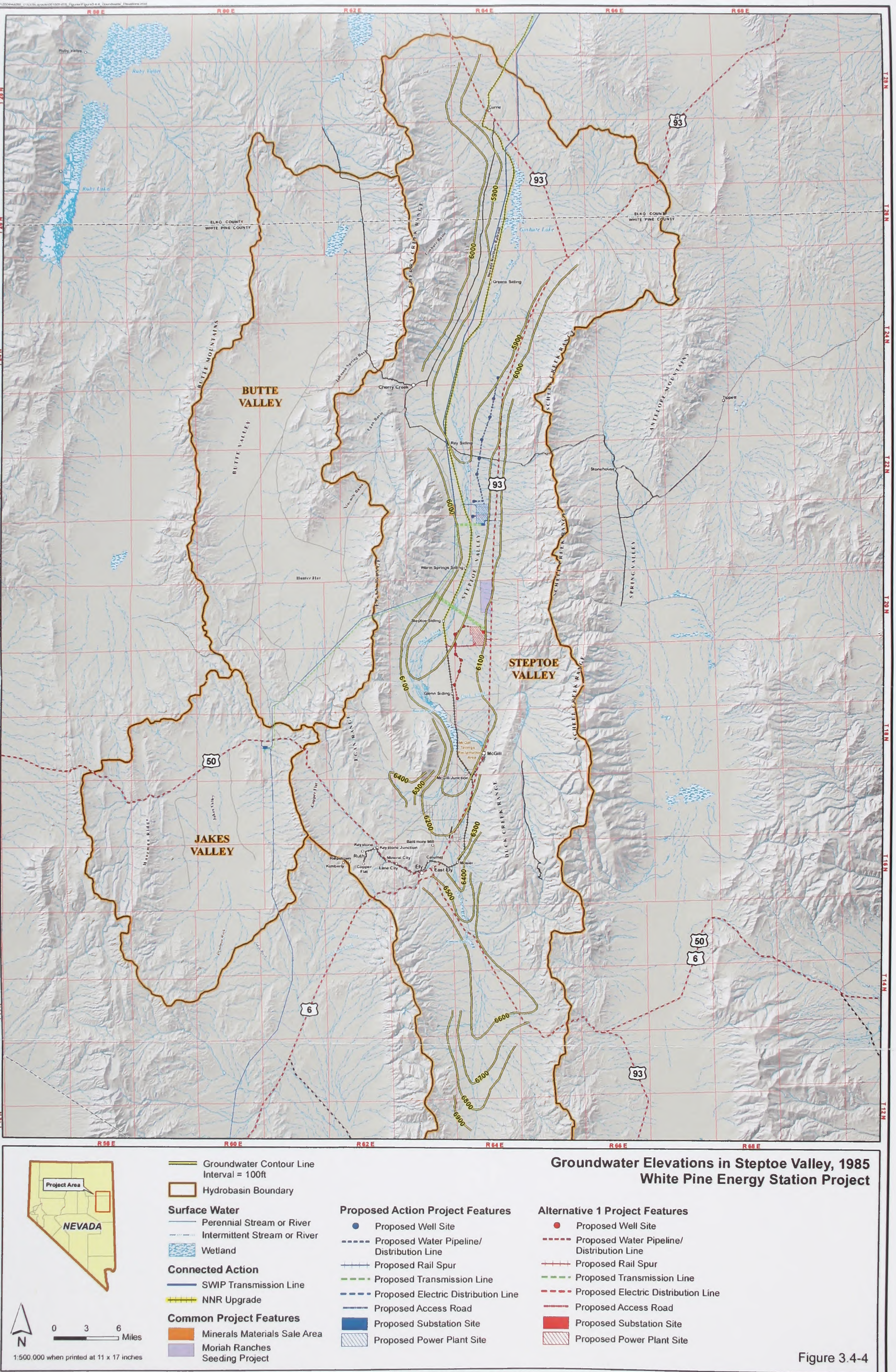
The only known source of water to the basin-fill aquifers in Steptoe Valley is precipitation that falls as either rain or snow within the boundaries of the basin. However, according to Nichols (2000), potentially as much as 2,000 acre-feet per year of ground water could flow into Steptoe Valley from Butte Valley, which is the basin west of Steptoe Valley (see Figure 3.3-1). This hypothesis is contrary to the conclusions in Eakin et al. (1967). Although considerable uncertainty surrounds the notion of ground water inflow from Butte Valley, the underlying regional fractured-rock aquifers most likely contribute to the discharge of some of the springs in Steptoe Valley (see discussion in Section 3.4.2.5). Nonetheless, the regional fractured-rock aquifers are considered to be independent of the overlying basin-fill aquifers in Steptoe Valley (Eakin et al., 1967; Frick, 1985).

The pathways that precipitation follows to reach ground water are both the infiltration of direct precipitation and the infiltration of stream flow. The remainder of the precipitation that does not reach ground water runs off as surface water, evaporates (either from standing water or from soil), or it is taken up by plant roots and is transpired to the atmosphere before it can reach the ground water.

Annual precipitation at specific locations within Steptoe Valley is discussed in Section 3.3, *Surface Water Resources*). Collectively, the estimates of the total amount of precipitation that falls across the entire Steptoe Valley watershed vary from approximately 810,000 acre-feet per year (Lopes and Evetts, 2004), to as much as 1,344,191 acre-feet per year (Nichols, 2000). Corresponding estimates of the total annual ground water recharge to the basin-fill aquifers in Steptoe Valley range from 83,600 acre-feet per year (Frick, 1985) and 85,000 acre-feet per year (Eakin et al., 1967; Lopes and Evetts, 2004) up to 132,000 acre-feet per year (Nichols, 2000). It should be noted that Frick (1985) also estimated that the leakage of water from streams contributed an additional 15,300 acre-feet per year for a total average annual rate of inflow to the ground water within Steptoe Valley of 98,900 acre-feet per year.

3.4.2.5 Ground Water Discharge from Steptoe Valley

Ground water leaves (discharges from) the basin-fill aquifers of Steptoe Valley through springs, evapotranspiration, ground water flow into Goshute Valley, and pumping from water wells.



Groundwater Elevations in Steptoe Valley, 1985
White Pine Energy Station Project

Figure 3.4-4

3.4.2.5.1 Springs

Numerous springs discharge ground water within the Steptoe Valley Hydrographic Area (see Figure 3.4-5). The amount of water that discharges from these springs varies from small seeps that are too small to be accurately measured (essentially little more than perennially damp soil), to flows of over 5,000 gallons per minute (gpm) (see Table 3.4-4).

While some springs may contribute minor flows to various ephemeral creeks in the surrounding mountains, almost all spring discharge that has not been diverted to storage (reservoirs for livestock) is consumed by evapotranspiration. Only a very small and insignificant percentage of spring discharge is believed to infiltrate back into the subsurface and actually reach ground water again (Eakin et al., 1967).

The springs in the surrounding mountains represent discharge points for precipitation (rain and/or snow) that has infiltrated through the rocks at the higher elevations of the mountains within the Steptoe Valley Hydrographic Area. Ground water that discharges from springs located in the mountains or along the mountain front, therefore, is not hydrologically connected to ground water in the basin-fill aquifers downgradient ("downstream") of these springs. However, those springs that discharge within the basin fill are generally hydraulically connected to, and, therefore, provide information about, the basin-fill aquifers.

The springs that discharge within the basin-fill of Steptoe Valley generally occur as a result of one of the following three mechanisms:

- **Geologic Faults.** Spring locations are controlled by geologic faults either where these faults act as barriers to ground water flow or where they cause a natural break in the topography that exposes the water table.
- **Leading Edge (Toe) of Alluvial Fans.** Alluvial fans are deposits of relatively coarse sediments that form fan-like structures where stream channels from the mountains meet the valley floor. At the fan toe, the contact between the coarser-grained fan material and the finer-grained basin-fill deposits of the valley floor causes ground water flowing through the fan to rise to the surface at the contact. In addition, the break in slope at the toe of alluvial fans also enables ground water to intercept the ground surface.
- **Subsurface Intrusions of Relatively Impermeable Rocks.** The presence of these rocks blocks ground water movement at depth and forces the water table to the surface.

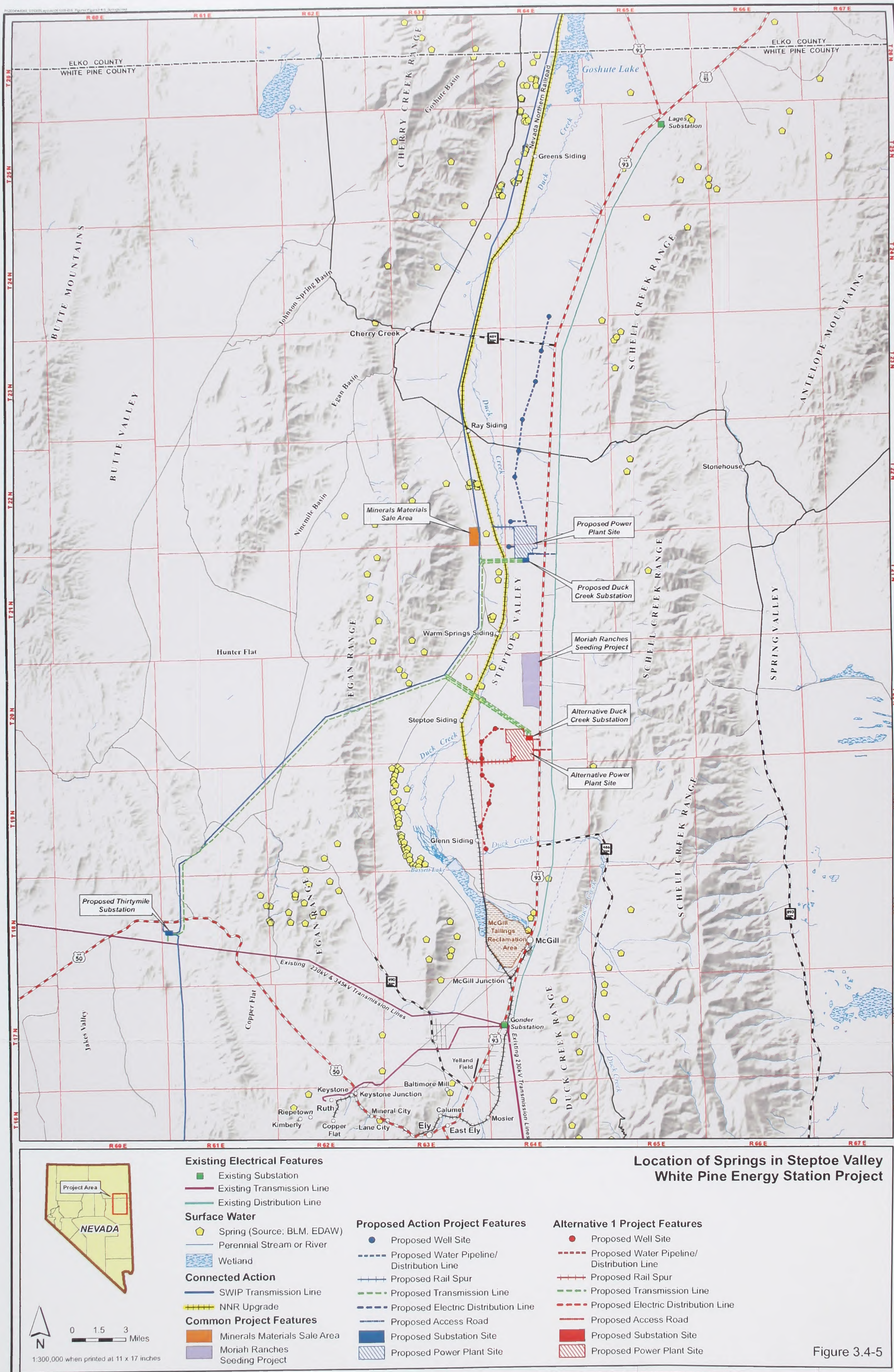
Within Steptoe Valley, the two largest springs, McGill Warm Springs and Murray Springs, discharge from the regional carbonate rock units discussed in Section 3.4.1.2, *Fractured-Rock Ground Water Systems* (Hess and Mifflin, 1978). At least 28 additional springs in the mountains that surround the valley have been identified by Hess and Mifflin (1978) as having their source in the regional carbonate rock. As a result, the presence of these springs suggests that relatively deep regionally flowing ground water contributes some water to the Steptoe Valley Hydrographic Area consistent with the widely recognized concept of ground water flow between basins in eastern Nevada. However, only a few of the literally dozens of springs within Steptoe Valley are thought to have the potential to discharge water that originates from outside the basin. The vast majority of the springs in Steptoe Valley discharge water that originates as local precipitation within the basin (Eakin et al., 1967).

TABLE 3.4-4

Discharge Information on Selected Springs in Steptoe Valley

Name	Latitude	Longitude	Township/Range	Elevation (feet amsl)*	Discharge (gpm)	Data Source
Currie Spring	40.1548	114.4509	N28 E64 33A	--	Ave = 2,334 (5.2 cfs) Max = 5,386 (12 cfs) Min = 1,032 (2.3 cfs)	Savard and Crompton (1993) data from June 1982 – Sept 1985
Murray Springs	39.1400	114.5345	N16 E63 21	--	Ave = 3,366 (7.5 cfs) Ave = 3,882 (8.7 cfs)	Frick (1985) 1970-1982 Savard and Crompton (1993) data from 1985-1988
McGill Springs	39.2502	114.4649	N18 E64 21BDDC1	--	Ave = 4,793 (10.68 cfs) Ave = 5,251 (11.7 cfs)	Frick (1985) data from 10/65-11/85 Savard and Crompton (1993) data from 2/86-2-88
Cambells Embayment Spring	--	--	N19 E63 05CDC1	6100	Max = 4,800 (10.7 cfs) Min = 390 (0.9 cfs) Ave = 4,355 (9.7 cfs)	Pupacko et al. (1989) Savard and Crompton (1993) 5 records from 1/82-2/22
Willow Creek			N14 E63 35A1	7500	685-620	Pupacko et al. (1989) 2 records 1965-1966

gpm—gallons per minute
cfs—cubic feet per second



Location of Springs in Steptoe Valley
White Pine Energy Station Project

Figure 3.4-5

3.4.2.5.2 Geothermal Springs

Geothermal springs are either warm or hot springs that derive their higher temperatures from the deep circulation of ground water within the subsurface. As a result, geothermal springs usually represent the discharge of ground water that did not originate as precipitation locally within the same basin as the spring. Steptoe Valley, like much of the State of Nevada, is within a region of known or potential geothermal resources (Shevenell and Garside, 2004). Consequently, although the vast majority of the springs in Steptoe Valley discharge relatively "cool" ground water with a temperature typically between approximately 52 and 64°F, the water temperature of a few of the springs is above 73°F, which puts them in the category of "warm" springs. Additionally, Monte Neva, Cherry Creek, and Lackawanna Springs are considered to be hot springs because their average temperature is above 85°F.

The various warm and hot springs in Steptoe Valley are listed in Table 3.4-5 and their locations are shown in Figure 3.4-5. The total discharge from these geothermal springs is approximately 10,700 acre-feet per year (or approximately 14.8 cfs).

With the exception of Collar and Elbow Spring, all warm springs in Steptoe Valley are within approximately 2 miles of known geologic fronts. These springs indicate zones of hydrothermal circulation that are probably formed and maintained by range-front faulting (Eaton, 1982). Collar and Elbow Spring, located southeast of Goshute Lake, is anomalous among the warm springs because it is near the center of a wide part of the valley.

3.4.2.5.3 Evapotranspiration

Evapotranspiration, which is the combined process of evaporation and the transpiration of water through plant tissue, occurs throughout Steptoe Valley. Most of the evapotranspiration, however, is limited to the valley floor adjacent to Comins, Bassett, and Goshute Lakes, and Steptoe and Duck Creeks (see Section 3.3, *Surface Water Resources*, and Figure 3.3-1).

Estimates of the total amount of evapotranspiration from the Steptoe Valley Hydrographic Area vary. According to Eakin et al. (1967) roughly 70,000 acre-feet per year of ground water is lost through evapotranspiration from approximately 143,000 acres of surface area and vegetation. Other investigators report higher estimates. Specifically, using a computer model to simulate the ground water flow in the Steptoe Valley basin-fill aquifers, Frick (1985) estimated that the amount of evapotranspiration was approximately 76,200 acre-feet per year. More recent work by Nichols (2000) concluded that the average annual rate of evapotranspiration is 128,000 acre-feet per year, and presented specific estimates for 1985 and 1989 of 118,000 acre-feet per year and 137,00 acre-feet per year, respectively.

3.4.2.5.4 Ground Water Flow to Goshute Valley

Inasmuch as the basin-fill aquifers of Steptoe Valley and Goshute Valley are widely understood to merge, some amount of ground water flows from Steptoe Valley to Goshute Valley, which is located hydraulically downgradient ("downhill"). The area through which ground water flows, however, is relatively small because of the presence of impermeable rocks. The amount of ground water flowing out of Steptoe Valley is estimated to be approximately 4,000 acre-feet per year (Nichols, 2000; Lopes and Evetts, 2004). Other investigators report somewhat lower estimates. Specifically, Eakin et al. (1967) report 1,000 acre-feet per year, and the computer model developed by Frick (1985)

TABLE 3.4-5

Information on Selected Geothermal Springs in Steptoe Valley

Name	Latitude	Longitude	Township/Range	Elevation (feet amsl)	Discharge (gpm)	Temperature (°F)	Data Source/Comments
Monte Neva Hot Springs[a]	39.665	114.807	N21 E63 25BA1	6030	630	176	1 record of discharge pre-1968 Pupacko et al., 1989)
Cherry Creek Hot Springs	39.883	114.893	N23 E63	—	60	124 to 188	Clark and Riddell (1920)
Collar and Elbow Spring	40.087	114.647	N26 E65	—	257	95	Clark and Riddell (1920)
Schellbourne Warm Springs (lower and upper)[a]	39.8	114.653	N22 E64 12 N22 E65 08BD1	7000	100 to 450 > 528	74	Variable discharges associated with different springs. Measured in 1966; Mifflin (1968)
McGill Warm Spring[b]		—	N18 E6503AD1	6640	4,578 4,490	84 76	1 record of discharge 1965 (Pupacko et al., 1989) 1 measurement in 1918; Hardman and Miller (1934)
Schoolhouse	39.453875	114.756462	N18 E64 03DB1	6280	450	84	1 record of discharge 1966 (Pupacko et al., 1989)
Lackawanna[a]	39.283	114.866	N16 E63 03A1	6300	135	95 70 to 95	1 record of discharge 1965 (Pupacko et al., 1989)

[a]Multiple individual springs associated with this spring name.
[b]Different spring from the “McGill Spring” listed in Table 3.4-4, above.

estimated 2,510 acre-feet per year of ground water flows from Steptoe Valley into Goshute Valley.

3.4.2.5.5 Ground Water Pumping

Numerous wells tap the ground water in the Steptoe Valley basin-fill aquifers for agricultural, municipal, industrial, and private domestic use. As most water wells are less than 1,000 feet deep, no local wells are known to tap ground water in the fractured rock either underlying the basin fill or in the adjacent mountains.

A summary of the historical amounts of ground water withdrawals from wells in Steptoe Valley is presented in Table 3.4-6.

3.4.2.6 Summary of Ground Water Budget for Steptoe Valley

Under natural conditions, over time, the amount of ground water inflow or recharge to the Steptoe Valley basin-fill aquifers will be balanced by the amount of ground water discharge. The inflow components of the ground water budget for Steptoe Valley consist of recharge and the infiltration from stream flows. The outflow components consist of spring discharge, evapotranspiration, ground water outflow to Goshute Valley, and pumping. The corresponding estimates of these ground water budget components are summarized in Table 3.4-7.

TABLE 3.4-6

Ground Water Pumping History in Steptoe Valley

Year	Estimated Pumping (acre-feet per year)	Data Source
1918	Minimal	Clark and Riddell (1920)
1960	1,000	Loeltz and Malmberg (1961)
1965	3,000	Eakin et al., 1967
1975	7,000	Bedinger et al., 1984
1981	32,000	Leeds, Hill, and Jewett, Inc. (1981 and 1983)
1981	17,388[a]	Nevada Department of Water Resources
1982	18,734[a]	Nevada Department of Water Resources
1983	17,606	Nevada Department of Water Resources
1984	15,490	Nevada Department of Water Resources
1985	20,289 17,468[a]	Frick (1985) Nevada Department of Water Resources
2000	6,360[b]	Lopes and Evetts (2004)

[a]Estimate of pumping for irrigation only developed based on crop and water surveys by the Nevada Department of Water Resources. Ground water pumping for other uses (for example, municipal, industrial, domestic) would add to this total.

[b]Of this total, approximately 3,560 acre-feet per year is for irrigation and stock watering, and 2,800 acre-feet per year is for municipal use.

TABLE 3.4-7
Summary of Ground Water Budget for Steptoe Valley

Budget Component	Amount (acre-feet per year)
Inflow	
Recharge from Precipitation	83,600 (Frick, 1985)
	85,000 (Eakin et al., 1967)
	85,000 (Nevada Department of Conservation and Natural Resources, 1971)
	85,000 (Nichols, 2000)
	85,000 to 132,000 (Lopes and Evetts, 2004)
Infiltration of Stream Flow	15,300 (Frick, 1985)
Total Ground Water Inflow	85,000 (minimum)
	132,000 (maximum)
Outflow	
Spring Discharge	Included in estimates of evapotranspiration
Evapotranspiration	70,000 (Eakin et al., 1967)
	70,000 (Nevada Department of Conservation and Natural Resources, 1971)
	76,200 (Frick, 1985)
	128,000 (Nichols, 2000)
Ground Water Flow to Goshute Valley	1,000 (Eakin et al., 1967)
	2,510 (Frick, 1985)
	4,000 (Nichols, 2000; Lopes and Evetts, 2004)
Pumping (2000)	6,360 (Lopes and Evetts, 2004)
Total Ground Water Outflow	86,360 (minimum)
	138,360 (maximum)

3.4.2.7 Ground Water Quality

In the Basin and Range Province, ground water is typically fresh and of very good quality along the margins of the basins where much of the ground water recharge occurs. As ground water flows from these recharge areas toward the center of the basins, and passes through sediments containing soluble salts, ground water quality typically degrades. At the center of the basins where the water table is relatively close to the ground surface (within approximately 10 feet), particularly in areas with dry lakes or playas, evaporation rates are high and salts become concentrated in the soil and shallow ground water. These general processes occur in Steptoe Valley.

Based on water samples from selected wells and springs in Steptoe Valley, shown in Figure 3.4-2, the water quality of the basin-fill aquifers is generally good, even in the central portions of the valley (see Table 3.4-8). This is likely the result of recharge occurring across the basin, particularly through the infiltration of water from water courses such as Duck Creek (see Section 3.3, *Surface Water Resources*). Available water chemistry data also indicate that the general character of the ground water is consistently calcium bicarbonate, which indicates the ground water tends to be "hard."

TABLE 3.4-8

Water Quality Data From Selected Wells and Springs in Steptoe Valley

	Wells			Springs			
	USGS Steptoe MX Well			Murray Spring	McGill Spring		
Location	N12 E63 12AB1	N20 E64 6A1	N23 E63 2B1	Lat: 39.1345 Long: 114.5355	Lat: 39.2431 Long: 114.3828	N19 E63 5C1	N20 E65 20C1
Date	16 June 03	31 July 65	29 July 65	14 June 83	24 August 78	16 May 66	17 October 65
Temperature (°Celsius)	12.2	13.9	—	12.5	18	—	6
pH	7.5	7.8	8.1	7.7	7.3	7.8	7.9
Specific Conductance (μS/cm)	432	590	452	360	650	432	207
Dissolved Oxygen	5.9	—	—	—	—	—	—
Bicarbonate	248	281	212	—	—	214	89
Nitrate (as N)	<0.008	—	—	—	—	—	—
Organic Carbon	1.0	—	—	—	—	—	—
Calcium	67.5	61	42	46	73	53	31
Magnesium	13.4	31	26	18	27	20	2.8
Sodium	8.22	29*	21*	3.6	18	11	17*
Potassium	2.0	—	—	0.7	4.1	3.7	—
Chloride	5.81	13	14	2.6	17	3.4	4.4
Sulfate	19.9	50	28	11	140	19	29
Fluoride	0.2	—	—	0.1	0.2	—	—
Silica	19.1	—	—	8.9	19	—	—
Iron	58	—	—	—	—	—	—

All units in milligrams per liter (mg/L)

* Includes potassium

3.4.2.8 Ground Water Use and Perennial Yield

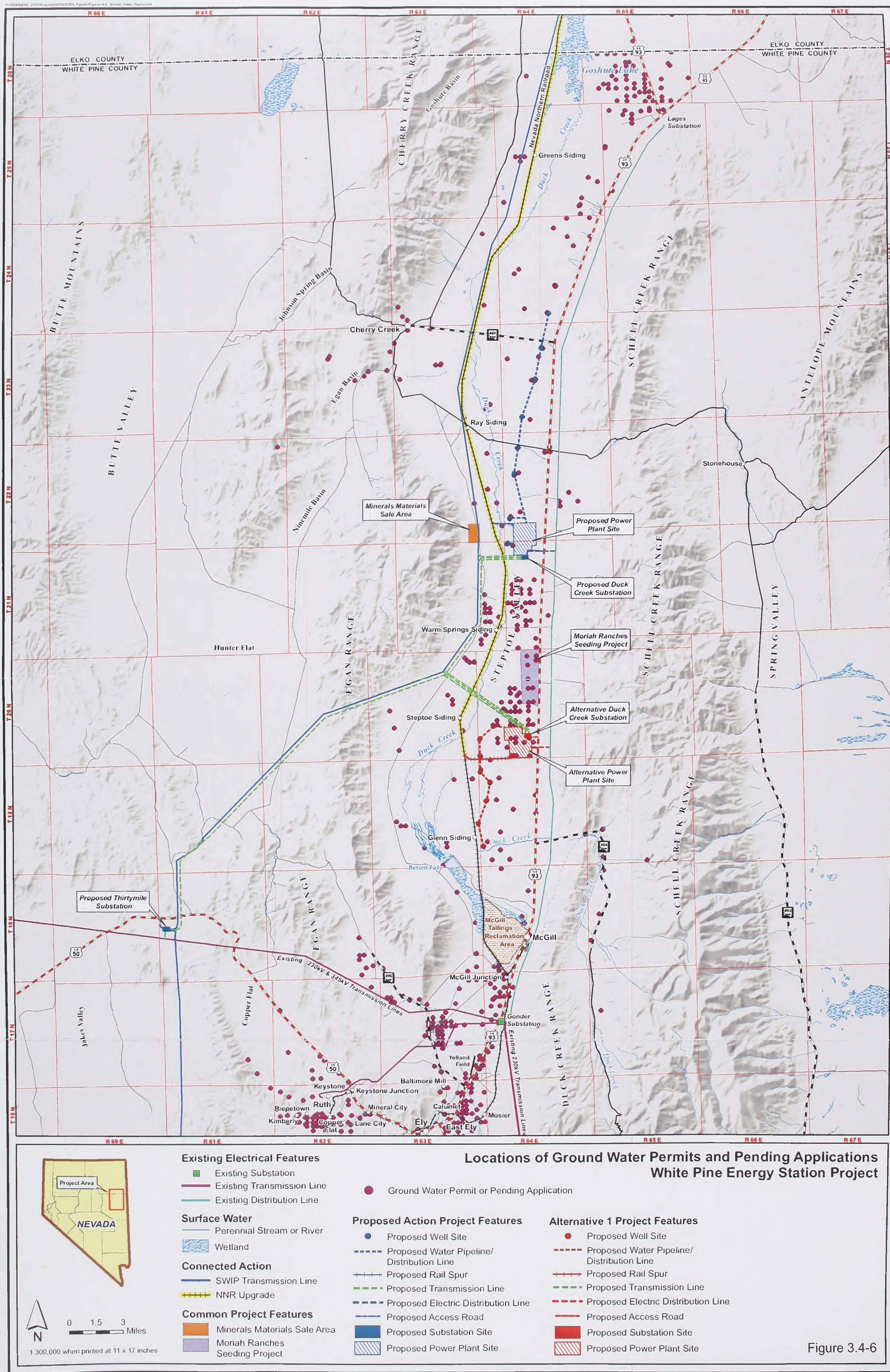
Ground water is currently pumped from the basin-fill aquifers in Steptoe Valley for municipal, private domestic, and agricultural use. As presented above in Table 3.4-6, the USGS has estimated that the total amount of ground water pumped from the Steptoe Valley Hydrographic Area in 2000 was 6,360 acre-feet per year. This is the most recent date for which a published estimate is available. Of this total of 6,360 acre-feet per year, approximately 3,560 acre-feet per year went to irrigation and stock watering uses, and 2,800 acre-feet per year went for municipal use. Estimates of historical use exceed 20,000 acre-feet per year (Frick, 1985).

The perennial yield of a ground water basin is defined as the maximum amount of ground water that can be pumped each year for an indefinite period of time without depleting the ground water in storage or causing deterioration of water quality beyond the limits of economic recovery. The perennial yield of the Steptoe Valley Hydrographic Basin has been established by the Nevada Department of Conservation and Natural Resources to be 70,000 acre-feet per year (Nevada Department of Conservation and Natural Resources, 1971).

According to the Office of the Nevada State Engineer, the ground water in the basin-fill deposits of Steptoe Valley is fully allocated by the Nevada Division of Water Resources. According to a BLM, internal planning document, the amount of committed resources is 78,531 acre-feet per year, which exceeds the currently established perennial yield by 8,531 acre-feet per year. As a result, the Nevada Department of Water Resources has designated the Steptoe Valley Hydrographic Area as being a basin where permitted ground water rights exceed the estimated perennial yield and the water resources require additional administration (Nevada Department of Conservation and Natural Resources, 2004).

The rights to the 5,000 acre-feet per year of ground water that would be pumped for the proposed Station (see Chapter 2.0, *Description of Proposed Action and Alternatives)* were granted in 1983 when the total amount of water appropriated in Steptoe Valley was less than 48,000 acre-feet per year (Nevada Department of Conservation and Natural Resources, 1983). Therefore, the water rights that would be used for the proposed Station were appropriated before the basin became overcommitted.

The locations of all applications and existing permits for ground water in Steptoe Valley are shown in Figure 3.4-6.



Locations of Ground Water Permits and Pending Applications
White Pine Energy Station Project

Figure 3.4-6

3.5 Biological Resources

3.5.1 Vegetation

Vegetation resource investigations addressed the areas proposed for construction and operation of project features and proposed ROWs for the Proposed Action (see Section 2.2, *Proposed Action*) and Alternative 1 (see Section 2.3, *Alternative 1).* Vegetation communities and noxious and invasive weeds were assessed in a 200-foot-wide corridor for the water pipeline ROWs and the rail spur ROWs and in a 0.5-mile-wide corridor for the transmission lines ROWs. Issues relating to wetlands and drainages potentially under the jurisdiction of the U.S. Army Corps of Engineers were assessed in specific buffers around proposed project features as described in Section 3.5.1.1.10, *Wetlands.*

Preliminary information for vegetation and other natural resources in the project area was gathered from the Nevada Natural Heritage Program, communication with BLM staff, Natural Resources Conservation Service soil surveys (NRCS, 1998), Ecological Site Descriptions (NRCS, 1987), and the Southwest Regional GAP data (USGS, 2004). Landsat data were evaluated using Natural Resources Conservation Service rangeland suitability information and ER Mapper software to identify general plant communities in the project area. Biologists ground-truthed portions of the mapped area closest to the proposed project feature locations and used global positioning system unit to record plot data to refine the mapping and increase accuracy.

Field surveys were conducted between April and June 2005 tc confirm boundaries of vegetation community types and conduct a noxious and invasive plant species inventory.

Vegetation communities present in the project area, including wetlands, are discussed in the following text. Noxious and invasive plant species are discussed separately in Section 3.5.2, *Noxious and Invasive Weeds.*

3.5.1.1 Vegetation Communities

The project area lies in the Great Basin Desert floristic region, which is dominated by sagebrush shrublands and pinyon-juniper highlands. The basin and range topography is characterized by high mountain ranges interspersed with valleys. The project area is in Steptoe Valley, Butte Valley, and the Egan Mountain Range, which separates the two basins. The Schell Creek Range forms the eastern border of Steptoe Valley. Elevations in the project area range from approximately 5,800 feet at the proposed pipeline location to 7,600 feet at the proposed transmission corridor in the Egan Range.

Precipitation in nearby Ely averages 9.27 inches per year. Daytime temperatures range between 85°F and 90°F, and decline to 50°F to 60°F at night in the summer. July, the hottest month of the year, has a mean temperature of 67.3°F. January, the coldest month of the year, has a mean temperature of 24.0°F (WPHAS, 2005).

Various land uses including surface mining, irrigated agriculture, and livestock grazing, together with wildfire and grazing by wild horses and wildlife, have disturbed or affected vegetation resources in the project area. As a result of these land uses, the vegetative communities have been altered in many areas. Section 3.5.2, *Noxious and Invasive Weeds*, describes changes to vegetation communities as affected by weeds in more detail.

Elevation, soils, and land uses determine which plant communities are dominant in various locations in the project area. Based on the Landsat analysis, 10 main vegetation communities exist in the project area (see Figure 3.5-1) and are discussed in the following text. This section closes with a brief discussion of disturbed areas.

3.5.1.1.1 Big Sagebrush Shrubland

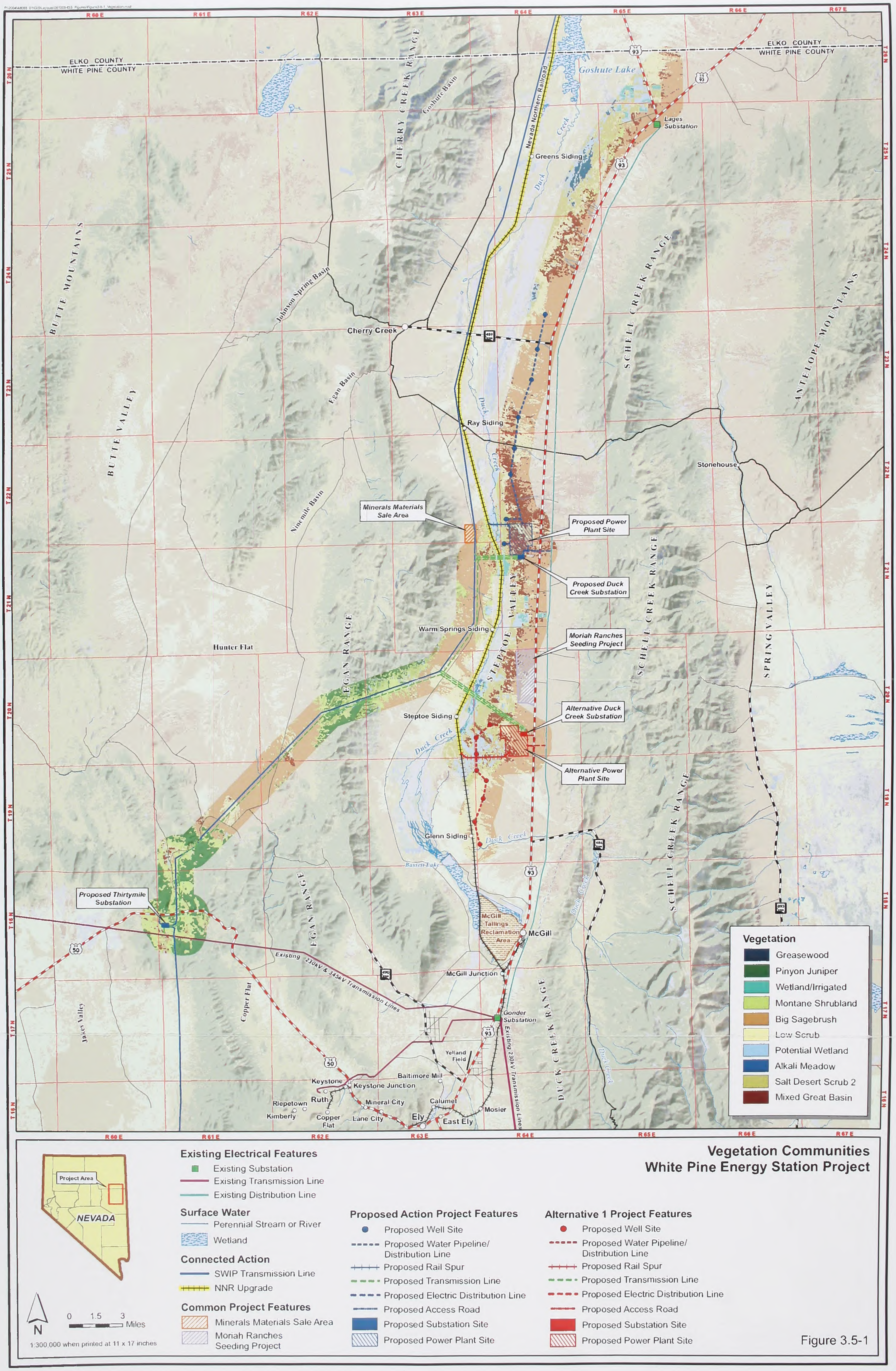
The Big Sagebrush Shrubland community is common on the lower foothills of the Egan Range, in Butte Valley, and in Steptoe Valley at elevations from 6,000 to 7,000 feet. The dominant sagebrush species is usually Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*), except in some areas of deep permeable soils, usually associated with drainage bottoms. These bottom areas often are co-dominated by basin big sagebrush (*A. tridentata* var. *tridentata*) with Great Basin wildrye (*Leymus cinereus*), and extend to elevations above 7,000 feet in Dry Canyon on the slope of the Egan Range. The more common Wyoming big sagebrush communities often form pure shrub communities with few other shrub and herb layer species. At lower elevations in Steptoe Valley, big sagebrush grades into the Salt Desert Scrub, Low Scrub and Grassland, and Greasewood communities, but remains the sole dominant shrub species. Other shrub species in the Big Sagebrush Shrubland include shadscale (*Atriplex confertifolia*), spiny hopsage (*Grayia spinosa*), snakeweed (*Gutierrezia sarothrae*), budsage (*Artemisia spinescens*), black sagebrush (*Artemisia nova*), winterfat (*Krascheninnikovia lanata*), and gray rabbitbrush (*Chrysothamnus nauseosus*). Understory may consist of Indian ricegrass (*Achnatherum hymenoides*), western tansymustard (*Descurainia pinnata*), squirreltail (*Elymus elymoides*), Sandberg bluegrass (*Poa secunda*), and the non-native invasive cheatgrass (*Bromus tectorum*).

3.5.1.1.2 Montane Sagebrush Shrubland

The Montane Sagebrush Shrubland community occurs in the Egan Range generally at elevations above 7,000 feet. This vegetation type occurs primarily in small basins with deeper soils and is frequently interwoven with Pinyon-Juniper Woodland and low sagebrush (*Artemisia arbuscula*), which grow on shallow, rocky soils. Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is the dominant shrub but other shrubs may include curl-leaf mountain mahogany (*Cercocarpus ledifolius*), antelope bitterbrush (*Purshia tridentata*), Utah serviceberry (*Amelanchier utahensis*), snowberry (*Symphoricarpos* sp.), snakeweed, gray rabbitbrush, and Mormon tea (*Ephedra viridis*). Understory grasses and forbs include squirreltail, Sandberg bluegrass, Indian ricegrass, lupine (*Lupinus argenteus*), and wavyleaf paintbrush (*Castilleja chromosa*).

3.5.1.1.3 Mixed Great Basin Shrubland

The Mixed Great Basin Shrubland occurs primarily in Steptoe Valley in a transitional habitat between Big Sagebrush Shrubland and Greasewood vegetation communities. The Mixed Great Basin Shrubland habitat shows little evidence of seasonal flooding similar to Greasewood communities, but possibly has a shallower water table than the often interwoven Salt Desert Scrub and Big Sagebrush Shrubland communities. This Mixed Great Basin Scrub community is co-dominated by big sagebrush and greasewood (*Sarcobatus vermiculatus*), but often includes shrub species of the Salt Desert Scrub vegetation community. Herb layer species include squirreltail and Indian ricegrass.



Vegetation Communities
White Pine Energy Station Project

Figure 3.5-1

3.5.1.1.4 Salt Desert Scrub

The Salt Desert Scrub community occurs in Steptoe Valley in locations adjacent to and possibly transitional between the Mixed Great Basin Shrubland and Greasewood Playa communities. The Salt Desert Scrub community is composed of saline tolerant shrubs including greasewood, shadscale, budsage, four-wing saltbrush (*Atriplex canescens*), snakeweed, winterfat, and green rabbitbrush (*Chrysothamnus viscidiflorus*) but typically no big sagebrush. This community occurs on valley floors in clay soils that are presumed to be generally seasonally inundated but less than the Greasewood Playa.

3.5.1.1.5 Low Scrub and Grassland

The Low Scrub and Grassland community occurs in Steptoe Valley, particularly at the southern end of the project area. This vegetation type is characterized by a mosaic of low-growing shrubs and grass species whereby one or more shrub or grass species dominate. Winterfat, snakeweed, and shadescale occur as the sole dominant shrub species or are co-dominant in a mix of low growing shrubs that often includes bud sage. Typically, greasewood and big sagebrush are absent. Black sagebrush forms very small patches in a few areas. Squirreltail or Sandberg bluegrass are consistently present and can be abundant and sometimes the dominant species in the Low Scrub and Grassland community. Cheatgrass is a consistent and often abundant invasive species in the herb layer. Recent evidence of disturbance includes only occasional wild horse prints and dung. Evidence of past cattle grazing includes very old dung and small barren feeding areas. Long-dead big sagebrush plants were observed in some areas but were not widespread in this vegetation type. No clear indication of what killed these plants was evident.

3.5.1.1.6 Greasewood Playa

The Greasewood Playa community occurs in flat areas on the floor of Steptoe Valley. Shrub species are present at the fringes of the playas. The most common shrub species is greasewood. Another commonly observed shrub in this community is rabbitbrush. Other species associated with the Greasewood Playa/Dunes community include bush sinkweed (*Suaeda moquinii*), basin wildrye, milkvetch (*Astragalus* spp.), and nodding thelypody (*Thelypodium flexuosum*).

3.5.1.1.7 Greasewood Dunes

The northern portion of the proposed water pipeline route traverses the edge of an area dominated by sand dunes. The dune systems in Steptoe Valley are associated with open playa and pans. The dunes are partially stabilized by salt-encrusted soils formed when water that is wicked from nearby seasonally inundated playa pans dries out. Loose sand substrates typically only occur on the leeward side of the dunes. Greasewood often grows along the dune crests and, along with salt grass (*Distichlis spicata*), basin wildrye, and rabbitbrush, helps stabilize the dunes.

3.5.1.1.8 Rabbitbrush

The Rabbitbrush community dominates in some previously disturbed areas in Steptoe Valley and the Egan Range where rabbitbrush is the dominant shrub species. Rabbitbrush is also associated with disturbed areas in Greasewood Playa/Dune, Big Sagebrush Shrubland, and Montane Sagebrush Shrubland vegetation communities and frequently shares herb layer species associated with these communities. The Rabbitbrush community is not mapped as a separate community because of its tendency to mix with other cover types.

3.5.1.1.9 Pinyon-Juniper Woodland

Pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) are dominant in the Pinyon-Juniper Woodland. This community generally occurs above 7,000 feet in elevation in the Egan Range on both the Steptoe Valley and Butte Valley sides. Understory composition in this community varies with elevation, aspect, and soil conditions. The most frequently occurring shrub species are mountain big sagebrush and low sagebrush. Mountain mahogany (*Cercocarpus montanus*), curl-leaf mountain mahogany, grey rabbitbrush, and antelope bitterbrush are less abundant shrub layer species. Herb layer species include Sandberg bluegrass, Indian ricegrass, Thurber's needlegrass (*Achnatherum thurberiana*), caespitose buckwheat (*Eriogonum caespitosum*), cushion buckwheat (*Eriogonum ovalifolium*), wavy-leaf paintbrush, dusty maidens (*Chaenactis douglasii*), and cushion stenotus (*Stenotus acaulis*).

3.5.1.1.10 Wetlands

Landsat imagery analyses and field surveys conducted through May and June 2005 were used to identify wetland communities based on vegetative and general landforms. A formal wetland delineation was conducted in July and October 2006 to assess the extent of wetlands and potential "waters of the United States" that would be under United States Army Corps of Engineers (USACE) jurisdiction and require permits under Section 404 of the Clean Water Act. The following two subsections describe the general wetland community types and the wetland delineation results.

Wetland Communities

The largest areas of wetlands are associated with the Duck Creek floodplain and tributaries to Duck Creek near the power plant site associated with Alternative 1. All wetland vegetation in the project area is dominated by herbaceous vegetation. The nearest willow- (*Salix* spp.) dominated wetland vegetation was observed near Bassett Lake and the McGill Tailings Reclamation Area more than 1 mile from the alternative water pipeline route. Other shrub-dominated wetlands include those areas supporting greasewood growing in association with playa pan habitats. The Greasewood Playa vegetation community is mapped where extensive examples were encountered during surveys. Other small inclusions occur throughout the Salt Desert Scrub vegetation community and were not mapped.

Smaller areas of wetlands, some of which are too small to be identified on Landsat imagery, are supported by the more than 100 springs in Steptoe Valley and at Dry Spring in the Egan Range. Dry Spring is located in the SWIP corridor near the summit of the Egan Range just west of Steptoe Valley. This spring is highly disturbed by livestock and wild horses, access roads, and development of the spring for livestock watering. Vegetation at the spring is primarily herbaceous and heavily cropped. The remaining springs occur throughout Steptoe Valley in areas outside the project area and do not directly overlap the proposed and alternative project footprints. A number of the springs visited along the western side of Steptoe Valley were found to support narrow bands of wetland vegetation such as clustered field sedge (*Carex praegracilis*), rushes (*Juncus* spp.), and spikerushes (*Eleocharis* spp.). However, some of the larger springs, and particularly those that have been developed for livestock watering, have larger areas of ponded water and emergent wetland plant species such as cattail (*Typha latifolia*), sedges, rushes, and spikerushes. In some cases, springs have dense coverage of watercress (*Rorippa nasturtium aquatica*).

The floodplain of Duck Creek is composed of diverse wet meadow vegetation and an adjacent upland band of alkali salt-crusted meadows (alkali meadow) that are interspersed primarily with Salt Desert Scrub vegetation. The project features that would intersect the Duck Creek drainage are as follows:

- Proposed Action transmission line segments from the power plant site to the SWIP corridor
- Proposed and alternative railroad spurs
- Water pipeline spurs southeast of Cherry Creek, Nevada, and just west of the Proposed Action power plant site
- Alternative 1 transmission line segments from the power plant site to the SWIP corridor

A tributary to Duck Creek west of the Alternative 1 power plant site forms a wide alluvial fan with multiple swales that have wet meadow vegetation interspersed with patches of Salt Desert Scrub vegetation and alkali meadow. The project features that cross these wet meadows include the proposed water pipeline, distribution lines west of the Alternative 1 power plant site, and Alternative 1 railroad spur. Another tributary consisting of four wet swale areas with wet meadow vegetation occurs north of the Alternative 1 power plant site, but would not be crossed by project features. Agricultural land use in this area has reduced the extent of wetland vegetation.

Most of the wet meadow vegetation appears to be at least seasonally or intermittently flooded based on the plant species composition and evidence of surface inundation noted during the field surveys. The wet meadow vegetation is typically dense, but it thins out near the transition with alkali meadow where wetland species often grade into the adjacent shrub-dominated communities. Common wet meadow species include Baltic rush (*Juncus balticus*), silverweed (*Potentilla anserina*), clustered field sedge (*Carex praegracilis*), alkali bluegrass (*Poa juncifolia*), straight-leaf rush (*Juncus* cf. *orthophyllus*), alkali cordgrass (*Spartina gracilis*), alkali sacaton (*Sporobolus airoides*), inland saltgrass (*Distichlis spicata*), and creeping spikerush (*Eleocharis* cf. *palustris*). The alkali meadow vegetation in some places appears to be seasonally flooded or at least has water close enough to the surface to saturate the salt-crusted soils. The alkali meadow vegetation is often sparse and includes salt grass, thickspike wheatgrass (*Elymus lanceolatus*), Lemmon's rubberweed (*Hymenoxys lemmonii*), poverty weed (*Iva axillaris*), and fiddleneck hawkweed (*Crepis runcinata*).

Wetland Delineation

A delineation of potential "waters of the United States" under the jurisdiction of Section 404 of the Clean Water Act, including potentially jurisdictional wetlands and streams that have an ordinary high water mark (OHWM) and have a direct connection with Duck Creek, was conducted during the summer of 2006 using the U.S. Army Corps of Engineers' (USACE) 1987 *Wetlands Delineation Manual* (USACE, 1987). Wetlands and drainages were also evaluated to determine whether the potential for water quality impairment from construction-related ground disturbances exists. If such potential exists, work around the "NDEP-sensitive" features would require a Nevada Department of Environmental Protection (NDEP) temporary permit for working in waterways ("Rolling Stock Permit"). According to current NDEP management, NDEP-sensitive drainages include USACE jurisdictional drainages as well as the drainages that are not under USACE jurisdiction but meet one or more of the following criteria:

- Perennial drainages and their tributaries
- Drainages with no OHWM connected to waterbodies with interstate commerce use(s)
- Swales, ephemeral, and intermittent drainages with associated wetland or riparian habitat
- Disjunct drainages at least 1 foot deep ending within 0.5 mile of another waterbody with potential water quality impairment
- Any drainage that could potentially convey flows directly to Duck Creek or its associated wetland and riparian areas during even brief periods of high runoff (Mulligan, 2006).

The field delineation addressed the area within the Proposed Action and Alternative 1 project ROWs and buffer zones (Table 3.5-1).

TABLE 3.5-1

Areas Addressed During the White Pine Energy Station Wetland Delineation for the Proposed Action and Alternative 1 Project Components

Project Components	Buffer Width
Proposed Action	
SWIP/WPES ROW	1,500 feet on centerline
SWIP access roads	200 feet on centerline
SWIP ROW	1,350 feet (450 south, 900 north of centerline)
Rail spur ROW	500 feet on centerline
Water pipeline ROW	275 feet on centerline
Power plant including substation	100 feet on perimeter
Access road power plant ROW	200 feet on centerline
Alternative 1	
SWIP/WPES ROW	1,500 feet on centerline
Access road SWIP ROW	200 feet on centerline
Rail spur ROW	500 feet on centerline
Water pipeline ROW	275 feet on centerline
Power plant including substation	100 feet on perimeter
Access road power plant ROW	200 feet on centerline

The following is a summary of the wetland delineation findings (see Appendix B, *Wetland Delineation)*. A total of 441.3 acres were determined to be potentially under the jurisdiction of the USACE as "waters of the United States" (including 8 wetlands, totaling 240.3 acres; and 6 drainages, totaling 19.3 acres of "other potential waters of the United States" [streams]). The final jurisdiction determination is the responsibility of the USACE and their decision is not yet available. Approximately 126.5 acres of potentially jurisdictional wetlands were associated with the Proposed Action ROWs and buffers while 113.8 acres of potentially jurisdictional wetlands were associated with the Alternative 1 ROWs and buffers (Appendix B, *Wetland Delineation*).

The potentially jurisdictional wetlands documented in the vicinity of the Proposed Action and Alternative 1 project features were of three basic types: wet meadow, alkali meadow, and rabbitbrush meadow. Approximately 168.5 acres (70 percent) of the wetlands were alkali meadows and 2.1 acres (1 percent) were rabbitbrush meadows. Approximately 69.7 acres of wet meadow (29 percent of the wetlands) were documented in the various ROWs and buffers, particularly near Duck Creek.

In total, 122 drainages were identified in the field and assessed for their potential jurisdictional status with USACE and NDEP. The drainages included 61 ephemeral, 54 swales, 6 intermittent, and one perennial. The one perennial creek, Schell Creek, connects to Duck Creek. An intermittent stream that was found within the buffer but would not be crossed by the proposed or alternative ROWs is a stream in Water Canyon in the Egan Range along the SWIP/White Pine Energy Station transmission line ROW.

The six potential USACE jurisdictional stream segments included: the perennial Schell Creek mainstem and one intermittent tributary to Schell Creek, three intermittent Duck Creek mainstem segments, and one intermittent Duck Creek side channel. Section 3.3.3.1 provides general descriptions of the major streams in the project vicinity. Appendix B provides additional information on the potential waters of the United States. More than 98 percent of the 19.3 acres of other potential "waters of the United States" crossed by the proposed and alternative ROWs and buffers are associated with three segments of the main channel and one side channel of Duck Creek with OHWM channel widths of between 30 and 250 inches; the two other potential "waters of the United States" are associated with Schell Creek and its tributary. The Schell Creek segments have 18-32 inch-wide OHWM channels.

Duck Creek was observed to have slowly flowing water at all three locations where it is crossed by the proposed and alternative ROWs. Observations of Duck Creek approximately 5 miles south of Goshute Lake revealed a dry Duck Creek channel with a distinct bank and a bed having a high ground cover of hydrophytic vegetation.

It is highly probable that most of the 61 ephemeral drainages are not ordinarily connected to Duck Creek based on field observations and aerial photographic interpretation. Most of these drainages either percolate into the ground or are intercepted by irrigation ditches. It is unlikely that these diverted streams would be ordinarily connected to Duck Creek even if flows were not intercepted. There were no field observations of ephemeral tributary channels that cut through the broad alkali meadows along Duck Creek to ordinarily connect to the Duck Creek channel. Field observations in 2006 indicate that in many places along County Road 27 and the Nevada Northern Railway (NNR) water is intercepted and pools upstream of these development features. Most of the pooled water sinks into the ground. Typically, only a portion of the upstream flow is allowed to flow downstream of water diversions and frequently it is re-directed to a different, newer channel that is not as "broken-in" and does not convey water as efficiently nor as far downslope as the channel that received those flows for many years prior to the various developments. Dirt access roads in Steptoe Valley also were observed to have similar effects on flows in ephemeral streams.

In terms of NDEP-sensitive surface waters, the Proposed Action and Alternative 1 ROWs and buffers contain 8 wetlands (441.3 acres) and 61 drainages with potential for water quality impairment related to project construction. NDEP-sensitive surface waters include 61 additional drainages that are not expected to be subject to USACE jurisdiction because they are not ordinarily connected to Duck Creek. There are a total of 22 other ephemeral drainages in the project area that have no associated wetland or riparian habitat, are disjunct or are considered to have no potential to support flows into sensitive resources downstream, and are therefore not NDEP-sensitive.

3.5.1.1.11 Disturbed Areas

Areas previously disturbed by human or natural causes such as fire, mining, past or current agricultural use, or grazing are often weedy and may support large populations of halogeton (*Halogeton glomeratus*), Russian thistle (*Salsola kali*), mustards (*Descurainia* spp.), cheatgrass (*Bromus tectorum*), or other weedy species. These areas are described further in Section 3.5.2, *Noxious and Invasive Weeds*, together with several native plant species that may occur in disturbed areas. In addition, agricultural areas on private land may be irrigated and support non-native grass or hay species. Disturbed areas are not mapped on the vegetation communities map (Figure 3.5-1) because of limitations of the mapping software.

3.5.2 Noxious and Invasive Weeds

Noxious weeds are invasive, non-native species that are listed on state or federal noxious weed lists. Nevada state law defines noxious weeds as "any species of plant which is likely to be detrimental, or destructive, and difficult to destroy or eradicate." Because of their invasive nature, noxious weeds have the ability to become established and spread rapidly in an area, crowding out preexisting plants. Noxious weeds generally cause harm to production of agriculture, range, forestry, or other commodities. The risk of fire is also increased.

Analysis of weeds for purposes of this DEIS includes species in the following categories:

- Plant species listed or considered federal noxious weeds by the U.S. Department of Agriculture
- Plant species listed as noxious weeds by the State of Nevada Department of Agriculture (Nevada Revised Statutes 555)
- Noxious weeds of concern to the BLM

Distributions of noxious and invasive weed species were recorded using a scale of density provided by the BLM. The scale for percent cover of weeds in a given area was recorded as follows: none (zero); light (1 to 5 percent); moderate (6 to 25 percent); heavy (25 to 50 percent); and very heavy (more than 50 percent). The terms light, moderate, heavy, and very heavy are used in the following sections to describe the general percent cover of weeds.

3.5.2.1 Regulatory Framework

Federal Executive Order 13112, *Prevention and Control of Invasive Species* (February 3, 1999), defines invasive species as "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." This order mandates that any federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, identify such actions; prevent the introduction and spread of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; monitor invasive species and habitat conditions in ecosystems that have been invaded; and provide for restoration of native species and habitat conditions in ecosystems that have been invaded.

3.5.2.1.1 Federal Noxious and Invasive Weed Laws

A number of additional federal laws address invasive species and legislate the identification, treatment, and monitoring of the spread of invasive species. These are as follows:

- Lacey Act as amended (18 U.S.C. 42)
- Nuisance Prevention and Control Act of 1990 as amended (16 U.S.C. 4701 et seq.)
- Federal Noxious Weed Act of 1974 as amended by the Food, Agriculture, Conservation, and Trade Act of 1990 (Section 1453 "Management of Undesirable Plants on Federal Lands" U.S.C. 2801 et. seq.)
- Federal Plant Pest Act (7 U.S.C. 150aa et seq.)
- Carlson-Fogey Act of 1968 (Public Law 90-583).

The BLM, U.S. Department of Agriculture, and State of Nevada continually update noxious and invasive species lists in order to monitor invasive weed impacts on the economy and ecology of both private and public lands.

3.5.2.1.2 Nevada Noxious Weed Laws

The Nevada Department of Agriculture has the authority and responsibility under Chapter 555 of the Nevada Revised Statutes to enforce the State's noxious weed law. The function of the noxious weed program is to control noxious weeds to protect the crops, livestock, public health, wildlife, water quality, and beneficial uses of Nevada land. It is the responsibility of the landowner (public and private) to control and eradicate all plants designated as "noxious" on the State of Nevada list. This statute also created county weed control districts that are responsible for the control and eradication of noxious weeds within their boundaries. No designated Weed Control District covers the project area. Weed management in Nevada is facilitated by the Nevada Weed Action Committee under Nevada's Coordinated Invasive Weed Strategy (NDOA, 2000).

Nevada Department of Agriculture's White Pine County office was contacted at the start of the White Pine Energy Station studies to acquire a weed species list for the county. White Pine County uses the State Noxious Weed list, which is provided in Table 3.5-2. In addition to the listed noxious weeds, BLM identified invasive species of concern as listed in Table 3.5-3.

TABLE 3.5-2

Nevada Department of Agriculture Noxious Weed List

Common Name	Scientific Name	Common Name	Scientific Name
Category A Weeds[a]			
African rue	*Peganum harmala*	Leafy spurge	*Euphorbia esula*
Austrian fieldcress	*Rorippa austriaca*	Malta star thistle	*Centaurea melitensis*
Austrian peaweed	*Sphaerophysa salsula / Swainsona salsula*	Mayweed chamomile	*Anthemis cotula*
Camelthorn	*Alhagi camelorum*	Mediterranean sage	*Salvia aethiopis*
Common crupina	*Crupina vulgaris*	Purple loosestrife	*Lythrum salicaria, L. virgatum, and their cultivars*
Dalmation toadflax	*Linaria dalmatica*	Purple star thistle	*Centaurea calcitrapa*
Dyer's woad	*Isatis tinctoria*	Rush skeletonweed	*Chondrilla juncea*
Eurasian water-milfoil	*Myriophyllum spicatum*	Sow thistle	*Sonchus arvensis*
Giant reed	*Arundo donax*	Spotted knapweed	*Centaurea masculosa*
Giant salvinia	*Salvinia molesta*	Squarrose star thistle	*Centaurea virgata Lam.* var. *squarrose*
Goats rue	*Galega officinalis*	Sulfur cinquefoil	*Potentilla recta*
Houndstongue	*Cynoglossum officinale*	Syrian bean caper	*Zygophyllum fabago*
Hydrilla	*Hydrilla verticillata*	Yellow star thistle	*Centaurea solstiltialis*
Iberian star thistle	*Centaurea iberica*	Yellow toadflax	*Linaria vulgaris*
Klamath weed	*Hypericum perforatum*		
Category B Weeds[b]			
Carolina horse-nettle	*Solanum carolinense*	Russian knapweed	*Acroptilon repens*
Diffuse knapweed	*Centaurea diffusa*	Scotch thistle	*Onopordum acanthium*
Medusahead	*Taeniatherum caput-medusae*	White horse-nettle	*Solanum elaeagnifolium*
Musk thistle	*Carduus nutans*		
Category C Weeds[c]			
Black henbane	*Hyoscyamus niger*	Perennial pepperweed	*Lepidium latifolium*
Canada thistle	*Cirsium arvense*	Poison hemlock	*Conium maculatum*
Green fountain grass	*Pennisetum setaceum*	Puncture vine	*Tribulus terrestris*
Hoary cress	*Cardaria draba*	Salt cedar (tamarisk)	*Tamarix* spp.
Johnson grass	*Sorghum halepense*	Water hemlock	*Cicuta maculata*

Source: http://agri.nv.gov/nwac/PLANT_NoxWeedList.htm

[a] Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the state in all infestations

[b] Weeds established in scattered populations in some counties of the state; actively excluded where possible; actively eradicated from nursery stock dealer premises; control required by the state in areas where populations are not well established or previously unknown to occur

[c] Weeds currently established and generally widespread in many counties of the state; actively eradicated from nursery stock dealer premises; abatement at the discretion of the state quarantine officer

TABLE 3.5-3

Invasive Plants Identified in Project Area

Common Name	Scientific Name
Bur buttercup	*Ranunculus testiculatus*
Cheatgrass	*Bromus tectorum*
Common dandelion	*Taraxacum officinale*
Field bindweed	*Convolvulus arvensis*
Flixweed	*Descurainia sophia*
Halogeton	*Halogeton glomeratus*
American kochia	*Kochia scoparia*
Pepperweed	*Lepidium perfoliatum*
Prickly lettuce	*Lactuca serriola*
Russian thistle	*Salsola iberica*
Tumble mustard	*Sisymbrium altissimum*

3.5.2.2 Analysis Area and Methodology

Identifying the weeds in a project area allows land managers to determine the potential for further infestations based on a plant's phenology, distribution, and current site conditions. Invasive and noxious weeds were identified in the project area using a protocol developed by the BLM. During weed sampling inventories, vegetation mapping, and habitat assessment surveys conducted in June 2005, weed presence was documented at 0.25-mile intervals along the centerline of the proposed water pipeline and rail spur ROWs, and at each of the proposed power plant locations, substations, well sites, predetermined access roads, power distribution lines, and all other ancillary facilities associated with the development of the proposed project. Weed documentation also occurred at random locations along the proposed transmission (SWIP corridor) and distribution line ROWs.

3.5.2.3 Noxious Weeds in the Project Area

Field surveys conducted in June 2005 documented 11 invasive weed species and two noxious weed species in or alongside project feature sites for the Proposed Action and Alternative 1 (Table 3.5-4).

Noxious weed species found in the project area include hoary cress (*Cardaria draba*) and sulphur cinquefoil (*Potentilla recta*). Hoary cress was documented in moderate to heavy patches east of U.S. 93 and along some roads in the project area. Hoary cress populations were also observed within the Alternative 1 power plant footprint. The density of this species is heavy in some areas and very heavy along the road leading west up to the mouth of Duck Creek. Hoary cress grows in a wide range of soil types but is best adapted to alkaline soils that are wet during late spring (Sheley and Stivers, 1999). Therefore, sites most susceptible to invasion by this species are subirrigated pastures, rangeland, ditches, roadsides, and waste areas.

TABLE 3.5-4

Weed Populations Present in or Along Project Feature Sites for the Proposed Action and Alternative 1

Scientific Name	Common Name	Noxious or Invasive	Transmission Lines	Water Supply System	Rail Spur	Power Plant Site	Existing Roads
Proposed Action							
Cardaria draba	Hoary Cress	Noxious	—	—	A1	A1	PA, A1
Bromus tectorum	Cheatgrass	Invasive	PA, A1	PA, A1	PA, A1	PA, A1	PA, A1
Descurainia sophia	Flixweed	Invasive	PA, A1	PA, A1	—	PA, A1	PA, A1
Sisymbrium altissimum	Tumble mustard	Invasive	—	PA, A1	—	—	PA, A1
Salsola iberica	Russian thistle	Invasive	PA, A1	PA, A1	—	—	PA, A1
Halogeton glomeratus	Halogeton	Invasive	PA, A1	PA, A1	—	—	PA, A1
Lepidium perfoliatum	Pepperweed	Invasive	PA, A1	—	—	—	—
Ranunculus testiculatus	Bur buttercup	Invasive	PA, A1	—	—	—	PA, A1
Convolvulus arvensis	Field bindweed	Invasive	—	—	—	—	—
Kochia scoparia	American kochia	Invasive	—	—	PA	—	—
Potentilla recta	Sulphur cinquefoil	Noxious	PA, A1	—	—	—	—
Taraxacum officinale	Common dandelion	Invasive	PA, A1	—	—	—	—
Lactuca serriola	Prickly lettuce	Invasive	—	PA, A1	—	—	PA, A1

PA = Proposed Action; A1 = Alternative 1
Source: June 2005 field surveys.

Sulphur cinquefoil was documented along the transmission line corridor for both the Proposed Action and Alternative 1. This is a very aggressive species and susceptible locations include disturbed areas, waste places, roadsides, trails, ditches, abandoned lots and fields, pastures, and clear cuts (University of Nevada Cooperative Extension, 2005).

Populations of one other noxious weed species, musk thistle (*Carduus nutans*), were observed outside of the project area off of County Road 19 in Butte Valley. Because of the spreading nature of noxious weeds, this species is included in the impacts analysis and weed risk assessment even though it is currently outside of the project area. Musk thistle thrives in heavily grazed pastures but is rare in the absence of grazing (Beck, 1999).

The dominant invasive weed species found during surveys were cheatgrass, halogeton, flixweed (*Descurainia sophia)*, and Russian thistle. Halogeton and cheatgrass were frequently observed along access roads throughout the project area. Halogeton is the common invasive in upland shadscale and saltbush communities throughout the Great Basin (Nachlinger et al., 2001). Heavy infestations of both cheatgrass and flixweed were recorded in the Proposed Action power plant site.

In some areas, cheatgrass extends for hundreds of acres at varying levels of infestation. Other invasives documented in the area are populations of tumble mustard (*Sisymbrium altissimum)*, field bindweed (*Convolvulus arvensis)*, common dandelion (*Taraxacum officinale)*, bur buttercup (*Ranunculus testiculatus)*, pepperweed (*Lepidium perfoliatum)*, prickly lettuce (*Lactuca serriola)*, and American kochia (*Kochia scoparia)*. American kochia was observed at the very western end of the proposed rail spur alignment along the existing railroad tracks, into which the rail spur would connect.

Several native plant species were often observed in dense populations in disturbed areas in portions of the project area. The most prevalent of these is the pinnate tansymustard (*Descurainia pinnata*). This species was found near all of the major proposed project feature sites and was often found growing adjacent to flixweed populations. Poverty sumpweed (*Iva axillaries*) and bushy blazingstar (*Mentzelia dispersa*) are other native species that often occurred in and adjacent to disturbed areas.

A variety of land uses and disturbances has led to the proliferation of noxious and invasive weeds. BLM recreational trails and roads, particularly along the Egan Range, have created disturbances and introduced noxious/invasive species. The project area has been historically and is currently extensively grazed by domestic cattle and sheep, wild horses, pronghorn, and mule deer. The combination of long-term grazing and human access has resulted in very few areas having an undisturbed understory that is dominated by native herbaceous species. Invasive species have taken the place of native grass and forb species in many areas throughout Steptoe Valley and Butte Valley.

In addition to human-caused disturbances, a number of wildfires have occurred in and near the project area. At the southern end of the proposed transmission alignments within the SWIP corridor, BLM GIS data files show the Cruesoe fire burned 1,654.7 acres in 2000. Many native perennial grasses have revegetated the burned area, although cheatgrass is prevalent in portions of the transmission line corridor that intersect the burn. Evidence of several other wildfires not mapped by BLM was noted in the project area during biological field surveys in 2005. Cheatgrass, halogeton, and flixweed dominated in the vicinity of a large burn west of County Road 19 along a portion of the SWIP corridor in Butte Valley. Other areas on the eastern side of the Egan Range in Steptoe Valley that are now dominated by weeds may also have been previously burned.

Although many areas are now infested by weed populations, several of the surveyed areas currently have relatively low weed coverage. One such area is a portion of the proposed water pipeline ROW that contains stands of very large, mature basin big sagebrush with minimal weed cover. This area was also unique in that it supported pygmy rabbits (see Section 3.5.4.3, *Descriptions of Special Status Species)*. Much of the wetland area near Duck Creek along both the Proposed Action and Alternative 1 rail spur ROWs is also characterized by low densities of noxious or invasive weeds.

The proposed ROW for the transmission lines contains dense populations of invasive weed species because of past wildfires, mining activities, the presence of multiple access roads, and grazing use. However, the portion of the proposed transmission line corridor that crosses the Egan Range does not have a high density of noxious or invasive weeds, except for some areas along roads or trails that exhibit some level of infestation. Cheatgrass was the dominant invasive species seen within this portion of the transmission line ROW.

Further detail on the location and density of noxious and invasive weed species is provided in Chapter 4 as well as in the BLM Noxious and Invasive Weed Risk Assessment (Appendix C, Biological Resources Supplemental Information).

3.5.3 Wildlife and Fisheries Resources

The Great Basin is a cold, semi-arid desert where the stratification of land forms creates a uniquely diverse landscape. The habitats formed from the lowest valley playas to the highest alpine mountains provide distinct niches for wildlife. According to the Nevada Department of Wildlife (NDOW), Nevada is home to 161 species of mammals, 173 fish species, 24 species of amphibians, 78 species of reptiles, and 456 bird species (NDOW, 2004a). Most of the proposed project area is located in Steptoe Valley, which is home to a diverse assemblage of wildlife and wildlife habitat. This section addresses wildlife and wildlife habitats that occur or have the potential to occur in the project area. Species with Special Status (listed as Threatened, Endangered, Candidate, or Sensitive by government agencies) are addressed in Section 3.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

3.5.3.1 Regulatory Framework

3.5.3.1.1 Nevada Wildlife Management

Wildlife management in Nevada is under the jurisdiction of NDOW. Regulations regarding protected and unprotected wildlife species are established under Nevada Administrative Code Chapter 503. NAC Chapter 504 describes the Wildlife Management Areas (WMAs) managed by NDOW throughout the state. The closest WMA to the project area is the Steptoe Valley WMA, located south of Ely. NDOW also regulates activities that would "alter stream system or watershed to detriment of wildlife habitat" (Nevada Administrative Code 504.520). Any activity that would "obstruct, damage, diminish, destroy, change, modify or vary the natural shape and form of a stream system or its banks by any type of construction or other activity that is detrimental to the wildlife habitat" requires an NDOW permit (Nevada Administrative Code 504.520).

3.5.3.1.2 Migratory Bird Treaty Act (MBTA) of 1918 (as amended)

The Migratory Bird Treaty Act of 1918 (MBTA) (16 USC 703) established a federal prohibition, unless permitted by regulations, "to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess any migratory bird, or part, nest, egg of such bird listed in wildlife protection treaties among the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former U.S.S.R." Baiting and poisoning these species is also prohibited under this legislation. Species protected under the MBTA that may potentially occur in the project area are included in the impact assessment in Chapter 4.

As required by Executive Order 13186 (Protection of Migratory Birds, January 2001), the BLM developed a draft Memorandum of Understanding with the U.S. Fish and Wildlife Service (FWS) in 2001, which emphasizes a collaborative approach to migratory bird conservation, in cooperation with other agencies and organizations. This was further reinforced by the FWS Director's Order 146 of September 12, 2002.

3.5.3.1.3 Federal Land Policy and Management Act (FLPMA)

As amended, FLPMA provides direction to the BLM relative to managing for the conservation of biological diversity on public lands. According to the BLM and Office of the Solicitor (2001), this act mandates that public lands are managed in a manner that will:

- Protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values
- Where appropriate, will preserve and protect certain public lands in their natural condition
- Provide food and habitat for fish and wildlife and domestic animals
- Provide for outdoor recreation and human occupancy and use

In addition, the Principles of Biodiversity Conservation (Council on Environmental Quality, 1993) directs the BLM to "minimize fragmentation, promote native species, and avoid introducing non-native species, and to protect rare and ecologically important species."

The BLM works with NDOW to monitor, protect, and enhance wildlife habitat on federally managed lands in the project area. The BLM's Draft Ely Resource Management Plan (BLM, 2005a) provides guidelines and standards for habitat management. The BLM Draft Ely Resource Management Plan includes habitat management plans for the following:

- Management of crucial habitat for Threatened, Endangered, or Sensitive species where present
- Management of big game ranges to provide habitat for reasonable numbers of animals over the long term
- Improvement of riparian, wetland, and aquatic habitats
- Management of other habitats to meet needs of upland game and non-game animals

3.5.3.2 Analysis Area and Methodology

This section addresses methods used to describe common wildlife with the potential to occur in the project area for the proposed transmission lines, distribution lines, water pipelines, well sites, substations, power plant sites, rail spur ROWs and connection to the NNR north to Shafter, and all other ancillary facilities that would be constructed as part of the proposed project. Identification of species that have the potential to occur in the project area came from a variety of sources, including BLM and NDOW species lists; animals of Nevada fact sheets online; Nevada Natural Heritage Program (NNHP); BLM and NDOW data for raptors, greater sage-grouse, big game, springs (BLM only), and wildfire (BLM only); the FWS; and observations made during biological field surveys conducted in 2005 and 2006.

Habitat assessments for wildlife species in this DEIS focus on the ability of a landscape to provide cover, forage, water, and space requirements. Habitat assessments were based on field observations, vegetation community mapping, BLM fire data, and other existing resource information provided by NDOW, FWS, and BLM. Signs and occurrences of common wildlife species were recorded during vegetation community field studies and weed inventories. Species lists provided by the NDOW were examined prior to field surveys to familiarize field staff with wildlife species that may occur in the proposed project area.

During surveys conducted in the project area in May, June, and September 2005 and incidental to all other surveys described below, specialists recorded the occurrence of all wildlife species and sign within the proposed project area.

Surveys for specific wildlife were conducted for greater sage-grouse (*Centrocercus urophasianus)* in April 2005 and ferruginous hawks (*Buteo regalis)* in May 2005. Surveys conducted for noxious weeds in June 2005 also recorded areas with potential pygmy rabbit habitat. Surveys were also conducted in aquatic habitats that have the potential to be impacted by the proposed project. These surveys focused on the identification of endemic springsnails, relict dace, and the northern leopard frog. These surveys are discussed further in Section 3.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

3.5.3.3 Wildlife Habitats

The 10 different vegetation cover types found in the project area (see Section 3.5.1.1, *Vegetation Communities*) were combined into five general wildlife habitat types for the purpose of describing the affected environment for wildlife. Wildlife habitat types include Sagebrush and Mixed Shrublands, Greasewood and Salt Desert Scrub, Wetlands/Aquatic, Disturbance/Agriculture, and Pinyon-Juniper Woodlands. Appendix C, *Biological Resources Supplemental Information*, lists wildlife observed or likely to occur within the various habitat types in the project area. Appendix C is not a comprehensive list of potentially occurring species, but includes the species observed or most likely to occur on a regular basis in the project area. The following text describes the five wildlife habitat types and commonly associated wildlife species.

3.5.3.3.1 Sagebrush and Mixed Shrublands Habitat Type

The Sagebrush and Mixed Shrublands habitat type provides habitat for approximately 100 bird species and 70 mammal species (Braun et al., 1976; Trimble, 1989). Sagebrush habitat is considered a Priority A habitat under the *Coordinated Implementation Plan for Bird Conservation in Nevada* (Nevada Steering Committee Intermountain Joint Venture, 2005). The Sagebrush and Mixed Shrublands habitat type includes the Big Sagebrush Shrubland, Mixed Great Basin Shrubland, Low Scrub, and Montane Sagebrush Shrubland communities.

These habitats may be dominated by sagebrush, but other shrub species such as spiny hopsage, shadscale, budsage, snakeweed, or winterfat may also be present. Species that require sagebrush for some part of their life cycle are "sagebrush obligates." At least eight vertebrate species are considered sagebrush obligates: the greater sage-grouse, pygmy rabbit (*Brachylagus idahoensis)*, pronghorn antelope (*Antilocapra Americana)*, sage thrasher (*Oreoscoptes montanus)*, sage sparrow (*Amphispiza bellii)*, Brewer's sparrow (*Spizella breweri)*, sagebrush lizard *(Sceloporus graciosus)*, and sagebrush vole (*Lagurus curtatus*) (Paige and Ritter, 1999). All but the sagebrush vole were identified in the project area during biological field surveys. Suitable habitat exists for the vole and other small mammals associated with the Sagebrush and Mixed Shrublands habitat type.

Species such as pronghorn, pygmy rabbit, and sage-grouse feed exclusively on sagebrush in the winter when it is the only green forage available. Mule deer *(Odocoileus hemionus)* and sage-grouse use taller sagebrush for cover during the winter months (Dealy et. al., 1981). Sagebrush also provides cover for mule deer, fawns, antelope kids, elk calves, sage-grouse, and nesting cover for a variety of shrub-nesting species (Paige and Ritter, 1999).

Sagebrush habitats and their associated flora and fauna have been impacted and fragmented over time because of agricultural conversion, development, invasion of non-native plant species, extensive grazing, changes in fire regimes, and sagebrush eradication programs (Paige and Ritter, 1999). These impacts have altered the ecology, vegetation communities, and natural disturbance patterns of the sagebrush ecosystem.

Sagebrush habitat is the dominant habitat in much of Steptoe Valley and Butte Valley. This habitat is present along the alternatives for the proposed transmission line corridor, water pipeline alignment, distribution lines, portions of the rail spur development, substation locations, well sites, and power plant sites. Several areas of especially high-quality sagebrush habitat (with little invasive weed cover) occur on and near the water pipeline ROW just west of the Alternative 1 power plant site and along the rail spur location.

3.5.3.3.2. Greasewood and Salt Desert Scrub Habitat Type

The primary shrub species in the Greasewood and Salt Desert Scrub habitat type are greasewood, shadscale, winterfat, budsage, horsebrush, fourwing saltbrush, and Mormon tea. Associated grasses include Indian ricegrass and salt grass (NNHP, 2004). Vegetation communities in this habitat type include Greasewood Dunes, Greasewood Playa, and Salt Desert Scrub. The Salt Desert Scrub habitat can support some or all of the habitat requirements of sagebrush breeders like sage thrashers, sage sparrow, and Brewer's sparrow. This cover type provides habitat for ground squirrels (*Spermophilus spp.)*, cottontails (*Sylvilagus nuttallii)*, horned lizards (*Phrynosoma platyrhinos)*, dark and pale kangaroo rats (*Dipodomys spp.*), and other wildlife species. Salt Desert Scrub habitat provides winter cover habitat for a variety of wildlife species. Pronghorn were observed in this cover type during biological field investigations in 2005.

This habitat type is primarily found in Steptoe Valley along the proposed water pipeline alignment, distribution lines, well, and pumping sites. Salt Desert Scrub habitat in the project area often coincides with the floodplain of Duck Creek and other drainages in Steptoe Valley and lies on the boundary of some wetlands along the Alternative 1 rail spur route.

3.5.3.3.3 Pinyon-Juniper Woodlands Habitat Type

The Pinyon-Juniper Woodlands habitat type provides cover for a variety of raptor species, including ferruginous hawk, golden eagle *(Aquila chrysaetos)*, red-tailed hawk *(Buteo jamaicensis)*, prairie falcon *(Falco mexicanus)*, turkey vultures *(Cathartes aura)*, kestrels *(Falco sparverius)*, and Swainson's hawk (*Buteo swainsoni*), among others. The Pinyon-Juniper Woodlands habitat type also provides forage and cover for mule deer, pronghorn, bushy-tailed woodrats (*Neotoma cinerea*), western fence lizards *(Sceloporus occidentalis)*, spotted towhees *(Pipilo maculates)*, black-throated gray warblers *(Dendroica nigrescens)*, mountain chickadees *(Poecile gambeli)*, black-billed magpies *(Pica hudsonia)*, and a number of other avian and small mammalian species.

The project area encompasses Pinyon-Juniper Woodlands habitat along portions of the proposed transmission line ROW and substation alternatives. This habitat type dominates portions of the SWIP corridor in the Egan Range.

3.5.3.3.4 Wetlands/Aquatic Habitat Type

The Wetlands/Aquatic habitat type includes the Alkali Meadow and Wetland vegetation communities associated with the floodplain of Duck Creek between Bassett Lake and Goshute Valley and numerous springs in Steptoe Valley and portions of the Egan Range. Wetlands are important habitats for waterfowl and numerous other wildlife species in Nevada (NDOW, 2005b). Wetlands provide a water source for big game such as pronghorn and mule deer, as well as other species like the greater sage-grouse. Wetlands associated with rivers or ephemeral and perennial alkaline lakes concentrate colonies of gulls (*Larus* spp.), Wilson's phalarope (*Phalaropus tricolor*), white-faced ibis (*Plegadis chihi*), eared grebe (*Podiceps nigricollis*), and American avocet *(Recurvirostra Americana)*. Wetlands are very important for migrants (for example, western snowy plover [*Charadrius alexandrinus*] and long-billed curlew [*Numenius americanus*]), and for breeding species such as the least bittern (*Ixobrychus exilis*) (Nachlinger et al., 2001). Wetlands are considered a Priority A habitat under the *Coordinated Implementation Plan for Bird Conservation in Nevada* (Nevada Steering Committee Intermountain Joint Venture, 2005).

Field observations during May and June 2005 revealed use of the wetlands by several pairs of waterfowl, waterbirds, and shorebirds. Additional species may be found in these areas during spring and fall migration. During the May-June 2005 fieldwork, the Duck Creek floodplain in the vicinity of the proposed rail spur had a substantial amount of surface water that provided a diversity of wetland habitat. The area provided the largest amount of open water wildlife habitat north of Basset Lake in Steptoe Valley. The primary wildlife species identified in wetlands in the project area during biological surveys were the long-billed curlew, American avocet, northern pintail *(Anas acuta)*, mallard *(Anas platyrhynchos)*, sandhill cranes *(Grus Canadensis)*, and red-winged blackbirds *(Agelaius phoeniceus)*. Steptoe Valley provides a corridor for migratory species. The wetlands located in these areas provide habitat for migratory species (Williams, 2005; Crookshanks, 2005).

The primary perennial aquatic habitat in the vicinity of the project area is Duck Creek, which flows out of the Schell Creek Range near the Alternative 1 power plant site and then north through Steptoe Valley (see Section 3.3.3, *Surface Water Features*). Portions of Duck Creek, especially those north of the Cherry Creek Road, do not have surface water most summers. Many other intermittent/ ephemeral streams drain the Egan Range and Schell Mountain Range.

Approximately 45 natural springs are located in Steptoe Valley in the general region of the proposed project. Most of the springs are located along the western edge of Steptoe Valley and appear to provide permanent or seasonal surface water for wildlife. In addition, several small intermittent or seasonally inundated springs and drainages exist in the Egan Range and southern Butte Valley. In many cases, these springs support associated wetland vegetation communities. These springs contain potential habitat for a number of springsnails that are often endemic to the State of Nevada or Steptoe Valley. Signs of greater sage-grouse were noted near several of the springs along the western edge of Steptoe Valley. Some of the perennial springs provide critical habitat for species like the BLM-Sensitive and state-protected relict dace (*Relictus solitarius)* and amphibian species such as the northern leopard frog (*Rana pipiens*), along with numerous wildlife species. Additional details on aquatic biota associated with the springs are presented in Section 3.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

3.5.3.3.5 Disturbance/Agriculture Habitat Type

This habitat type includes areas that have been altered by human use and/or development along with natural disturbance such as wildfire. Habitats disturbed by development, agriculture, heavy grazing, gravel pits, or wildfire are included under this category. Lands used for agricultural purposes are located entirely on private lands within the project area. Areas that have been disturbed by wildfire have revegetated either naturally or by seeding, and may be dominated by a variety of weeds or native low-growing shrub species representative of the Low Scrub vegetation community type, including winterfat and snakeweed. These shrubs may be co-dominant in a mix that often also includes grasses such as squirreltail or cheatgrass. Sagebrush is largely missing from areas previously burned or heavily grazed. Some wildlife have adapted to utilize these areas for basic cover and transition habitat. Sandhill cranes, other avian species, and small mammals are commonly found foraging in agricultural fields.

3.5.3.4 Common Wildlife

Common wildlife includes species that are relatively abundant or have not been designated as species of special concern by the BLM, NDOW, or FWS. Species listed as Threatened, Endangered, Candidate, or Sensitive by the BLM, FWS, and NDOW are described in Section 3.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

3.5.3.4.1 Mammals

The primary predator observed in the project area was the coyote (*Canis latrans)*. Coyotes were observed along various sections of the proposed water supply system alignment. Coyote sign was observed throughout the project area in all cover types. Coyotes are known to inhabit all community types and have adapted to human development (NDOW, 2005c). Kit fox (*Vulpes macrotis*) and gray fox (*Urocyon cinereoargenteus*) are also known to inhabit the project area. The portion of the proposed transmission line that spans the Egan Range contains rocky terrain suitable for bobcat (*Lynx rufus*) foraging and denning habitat.

Mountain lions (*Felis concolor)* are a predatory Nevada big game species that can be found in a wide variety of habitat types but prefer dense cover on rocky, rugged terrain (NDOW, 2005d). In the project area, the Egan Range/Butte Valley portion of the proposed transmission line corridor provides suitable habitat for the lion. Mountain lion scat was found along County Road 17 on the west entrance to Butte Valley. The presence of mule deer, antelope, and small mammals in the project area provides prey for mountain lions. Rocky cliffs and ledges in the Egan Range provide potential denning habitat for this species.

The project area contains suitable habitat for lagomorphs such as the black-tailed jackrabbit (*Lepus californicus)*, mountain cottontails, and pygmy rabbits (the latter species is addressed in Section 3.5.4.3, *Descriptions of Special Status Species.* All three of these species were observed during biological field surveys. Black-tailed jackrabbits and cottontails were observed in the Pinyon-Juniper, Sagebrush Shrublands, and Salt Desert Scrub cover types. Pygmy rabbits prefer sandy deep soils in big basin sagebrush stands. Several pygmy rabbits were observed on the southern end of the Alternative 1 proposed water pipeline route.

A number of other small mammals occur or have the potential to occur in the project area. Small mammals that occur in mountainous or rocky areas include the rock squirrel (*Spermophilus variegates)*, least chipmunk *(Tamias minimus)*, and Richardson's ground squirrel *(Spermophilus elegans nevadensis)*. Richardson's ground squirrel can also be found in Sagebrush and Mixed Shrublands habitats along with the white-tailed antelope squirrel *(Ammospermophilus leucurus)*, golden-mantled ground squirrel *(Spermophilus lateralis)*, Piute (Great Basin) ground squirrel *(Spermophilus mollis)*, and Townsend's ground squirrel (*Spermophilus townsendii*). The project area contains potential habitat for badgers (*Taxidea taxis)* and pygmy shrews *(Sorex minutus)*. No badgers were observed during field surveys. According to NNHP records, the project area contains potential habitat for a minimum of eight species of bats, which are discussed in Section 3.5.4.3*, Descriptions of Special Status Species.*

Mule deer and pronghorn are the two primary big game species that occur in the project area. Steptoe and Butte Valleys act as migration corridors for big game. Migration/movement corridors are also found where the proposed distribution line crosses U.S. 93.

According to NDOW, the project area contains crucial winter range, winter range, overall range, and intermediate range for mule deer. Crucial winter range lies along most of the proposed transmission line corridor, the distribution lines, the Alternative 1 power plant site, and the southern end of the Alternative 1 water pipeline route. Winter range lies east of U.S. 93. A portion of the transmission ROW in Butte Valley is mapped as winter range. Crucial summer range mapped by NDOW occurs east of County Road 29 in the Schell Creek range well outside of the project area. Mule deer were observed in both Steptoe Valley and Butte Valley during field surveys. Mule deer sign was present along the Egan Range portions of the transmission lines ROW and near all other project feature sites.

The project area is considered year-round range for pronghorn. Multiple herds of pronghorn were observed during biological site visits in May, June, and July 2005. Pronghorn were observed in Butte Valley, Steptoe Valley, and at the base of the Egan Range. One newborn fawn was observed along the western toe slope of the Egan Range in Sagebrush and Pinyon-Juniper habitats. Data were not available that delineate pronghorn fawning grounds, but it is assumed these areas exist within the project area based on the fore-mentioned sighting and the presence of suitable habitat. According to Einarsen (1948), traditional pronghorn fawning areas are described in terms of terrain characteristics and vegetation height. Optimal fawning grounds were characterized as being situated in a basin, surrounded by a low ridge of hills, where standing vegetation averaged 9 to 18 inches in height.

The pronghorn fawning period is May through June. The greatest densities of pronghorn in the Great Basin occur between 4,000 and 6,000 feet elevation (Yoakum, et al., 1996). Characteristics common to preferred pronghorn ranges in the Great Basin include: ground cover averaging 50 percent live vegetation; a variety of upland species including grasses, forbs, and shrub species; and succulent plants for spring and wet summers (USFS, 2006).

Elk (*Cervus elaphus*) were not observed during biological field investigations. Elk habitat mapped by NDOW is located north of the project area towards Goshute Lake. BLM has mapped elk habitat in the northern end of White Pine County in portions of Butte Valley, the Egan Range, and an area east of U.S. 93 near the county line. Conversations with NDOW biologists indicated that elk are known to migrate and forage in the project area (Foree, 2006). Crucial habitats for elk are not found within the project area. No elk were seen during field surveys and no existing data from BLM and NDOW have recorded occurrences of elk in the proposed project area.

3.5.3.4.2 Birds

Raptors

The project area contains suitable habitat for a number of raptor species.

Hawkwatch International (2005) conducted raptor surveys at 36 stations in the Egan and Schell Ranges surrounding Steptoe Valley during fall 2004 and spring 2005. Raptor flight-lines were documented in the Egan Range, particularly near the ridgelines. During fall migration, 12 raptor species were detected in the Ely area studied by Hawkwatch International (2005). The fall migration volume through the Ely area is much less than in the Goshute area (by far the largest volume site in the interior West). At 3.9 birds per hour, the Ely area is also less than at other Hawkwatch International monitoring sites in the western U.S. that range from 4.9 to 22.2 birds per hour. Consistent with other western migration-monitoring sites, sharp-shinned hawks, Cooper's hawks, red-tailed hawks, and American kestrels were the most commonly detected species during the fall. Golden eagles were also represented in relatively high numbers.

The spring survey yielded a total combined species tally of 436 migrating raptors of 17 species (an overall passage rate of 2.4 birds per hour). Similar to the fall, turkey vultures, sharp-shinned hawks, Cooper's hawks, red-tailed hawks, golden eagles, and American kestrels were the most abundant and ubiquitous species. Total spring counts of sharp-shinned hawks, Cooper's hawks, and American kestrels were all more than 50 percent less than in the fall, whereas spring counts of turkey vultures, red-tailed hawks, and golden eagles were all substantially higher than in the fall.

During biological field surveys conducted by EDAW in 2005, five raptor species were observed in the area of analysis. A pair of northern harriers (*Circus cyaneus)* was observed near wetland areas, agricultural areas, and mixed shrublands in Steptoe Valley. No northern harrier nests were found during any of the field visits in the project area. Several turkey vultures were seen throughout all portions and habitat types in the project area. A prairie falcon was observed perching on a juniper tree in Butte Valley just south of the proposed transmission line corridor. A golden eagle pair was also seen on multiple occasions in both Steptoe Valley and Butte Valley. This pair of golden eagles is likely nesting in the Egan Range; however, no eagle nests were found in any portion of the project area. American kestrels were seen throughout Butte Valley and at the base of the west side of the Egan Range. Ferruginous hawk habitat exists along the Pinyon-Juniper to Sagebrush Shrublands transition zone. This species is of special concern for the BLM and NDOW and is discussed further in Section 3.5.4.3, *Descriptions of Special Status Species*. No ferruginous hawks were observed in or adjacent to the project area; however, suitable habitat exists within the project area.

The Egan Range contains large cliffs, rocky outcrops, and pinyon juniper woodlands that could provide nesting opportunities for raptor species listed above as well as red-tailed hawk, Swainson's hawk, Cooper's hawk (*Accipiter cooperi)*, peregrine falcon *(Falco peregrinus)*, and others. Three abandoned nests were observed in juniper trees at the transition zone between Sagebrush and Pinyon-Juniper cover types on the west side of the Egan Range. One of the nests was unidentified and the other two were potentially ferruginous hawk nests based on size and location (juniper stringers). The Egan Resource Management Plan (BLM, 1984b) states that active raptor nests adjacent to areas proposed for vegetation conversion will be protected.

Shorebirds and Waterfowl

The project area contains a large wetland complex composed of wet meadow and multiple ponds that are associated with a branch of Duck Creek. This wetland complex is at its greatest extent and isolation at the location of the Proposed Action rail spur site to the power plant site. These wetlands host migratory species as well as resident avian and mammal species (Crookshanks, 2005). Duck Creek and the natural springs in the Steptoe Basin provide habitat for waterfowl and shorebirds during migration and year-round, particularly in wet years such as 2005. Some of the species observed during field surveys included sandhill cranes, mallards, American avocets, Northern pintails, and long-billed curlews.

Upland Game Birds

Upland game birds identified in the project area included mourning dove (*Zenaida macroura*) and greater sage-grouse. The greater sage-grouse is discussed in more detail in Section 3.5.4.3, *Descriptions of Special Status Species*. Mourning doves were observed in various portions of the project area along roadsides, and calls were heard near agricultural properties outside of the project area.

Other Birds

The project area contains habitats for a number of avian species. Common nighthawks (*Chordeiles minor)* were heard and observed on the east side of Butte Valley just east of County Road 19. Common ravens (*Corvus corax)* were observed throughout the project area and, together with western meadowlark (*Sturnella neglecta),* were the most frequently observed birds in the project area. Based on the diversity of habitats present, the project area likely supports many of the 140 bird species that are reported from the Steptoe Valley WMA, located south of Ely.

3.5.3.4.3 Amphibians

Because of the above-average precipitation that fell in Steptoe Valley in 2005, a number of the intermittent streams that drain the surrounding mountains combined surface water during the spring and early summer and thus provided habitat for native amphibians. The only amphibian species observed in 2005 were the northern leopard frog (*Rana pipiens*) and spadefoot toad (*Scaphiopus hammondi*). Spadefoot toads were observed at one spring in Steptoe Valley, while northern leopard frogs were documented at five springs, along an irrigation ditch flowing from Grass Spring, and in a small stream drainage south of the Alternative 1 power plant site. One other species, the Pacific tree frog (*Pseudacris regilla),* occurs in the project area but none were observed during field surveys.

3.5.3.4.4 Reptiles

Five reptile species were seen in the project area. A Great Basin gopher snake (*Pituophis catenifer deserticola)* was observed near a spring outside of the project area. Several western rattlesnakes (*Crotalus viridis lotus)* were observed off of County Road 19 in Butte Valley. A large number of western fence lizards, sagebrush lizards *(Sceloporus graciosus)*, and northern short-horned lizards were observed throughout the project area. The western fence lizards, short-horned lizards, and sagebrush lizards were found primarily in sagebrush, but were also seen in snakeweed, greasewood, and sagebrush mix.

3.5.3.4.5 Fish

Based on information provided by NDOW, the only native species of fish in the project area is the relict dace (Crookshanks, 2005). Relict dace are discussed further in Section 3.5.4.3, *Descriptions of Special Status Species.* Non-native fish species known to occur in Duck Creek or the other aquatic habitats in the project area include northern pike (*Esox lucius*), largemouth bass (*Micropterus salmoides*), and a species of chub (likely the non-native Utah chub [*Gila atraria*]). Until approximately 5 years ago, NDOW released rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), and tiger trout (*Salmo trutta x Salvelinus fontinalis*) in Tailings Creek (Crookshanks, 2005). This practice was ended because of water management changes and invasion by northern pike.

During May through June 2005, Duck Creek in the vicinity of the Proposed Action rail spur was overflowing its banks and flooding the nearby wetlands. During the September 22, 2005, aquatic surveys, the wetted channel of Duck Creek in the general vicinity of the proposed rail spur crossing was about 8 feet wide and held water that was primarily 8 to 12 inches deep but had pools that were over 24 inches deep. During drier years, the channel may have substantially less aquatic habitat available. The channel has dense submerged vegetation including *Ceratophyllum* sp. and *Potamogeton* spp. During the September survey, several 4- to

8-inch-long northern pike were observed in Duck Creek near the proposed rail spur site. Relict dace were noted at two springs during surveys of 45 different springs in Steptoe Valley; one was at a previously known site and one was unknown previously. Neither relict dace site was near proposed project facilities or within the well-fields. Carp, goldfish, and sunfish were documented in the Collar and Elbow Spring east of Goshute Lake.

3.5.3.4.6 Invertebrates

During the 1990s, surveys at several Steptoe Valley springs found several endemic species of the family Hydrobiidae. These springsnails are gill-breathing aquatic or semi-aquatic snails restricted to waters of unquestioned permanence and stability. Aquatic snails of all taxa combined were documented in 39 of 45 springs in Steptoe Valley surveyed in 2005. They included several species of pulmonates (*Physa* sp., *Lymnaea* sp., *Gyraulus* sp., and *Frasseria* sp.) and one species of springsnail (*Pyrgulopsis serrata*). Springsnails, which are of greatest concern because of their endemism and reliance on specific spring habitat conditions, were documented in 10 of the springs in the western portion of Steptoe Valley during the 2005 surveys (Sada, 2006). These springs were generally larger (longer springbrooks and greater discharge) than the average size of springs surveyed within Steptoe Valley, but springbrooks were comparatively narrow. These springsnail populations were previously undocumented. Prior to these surveys, *Pyrgulopsis serrata* was previously known to occur only in three springs, all of which occur along the west side of Steptoe Valley and within 15 miles of the northernmost spring (Collar and Elbow Spring) sampled during 2005 (Hershler, 1998).

3.5.4 Threatened, Endangered, Candidate, and Sensitive Species

This section addresses special status wildlife and plant species that occur or have suitable or potential habitat in the White Pine Energy Station project area. The FWS, NDOW, and NNHP were contacted to obtain information on local populations or potential habitat that could occur in the project area. BLM databases were examined for special status species occurrence data. Data adequacy reviews showed that recent data within the project area were not available for some species. As a result, species-specific surveys were conducted in summer 2005. These surveys included aerial surveys for the greater sage-grouse; ground-based surveys for the ferruginous hawk; aquatic surveys for springsnails, northern leopard frog, and relict dace; and habitat assessments for the pygmy rabbit and special status plants.

The term "special status species" as used in this DEIS includes any species that is federally listed as Endangered, Threatened, or Proposed to be listed or is a Candidate for listing under the ESA; Nevada BLM-Sensitive Species; and State Threatened, Endangered, or Species of Concern. These wildlife, fish, and plant species are protected under the regulations and policies described in the following text.

3.5.4.1 Regulatory Framework

3.5.4.1.1 Federal Endangered Species Act

The Federal ESA gives the FWS authorization to protect those species that are listed as threatened, endangered, and proposed for listing on both private and public lands. The FWS has authority over any endangered, threatened, or proposed species or designated critical habitat occurring within the project area. Any time a proposed project may affect a federally listed species, federal consultation is required under Section 7 of the ESA. The ESA prohibits the "take" of any federally listed species. "Take" includes killing, harming, or harassing any federally listed species. The FWS interprets "harm" to include significant habitat modification.

3.5.4.1.2 The Federal Land Policy and Management Act (FLPMA)

FLPMA direction to the BLM relative to managing for the conservation of biological diversity on public lands was described in Section 3.5.3.1.3, *Federal Land Policy and Management Act (FLPMA)*.

3.5.4.1.3 Bald and Golden Eagle Protection Act of 1940

This act prohibits the take; possession; selling; purchasing; bartering; offer to sell, purchase, or barter; transport; export or import; at any time or in any manner any bald eagle commonly known as the American eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof of the foregoing eagles. The term "take," as defined by this act, includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.

3.5.4.1.4 Migratory Bird Treaty Act (MBTA) of 1918 (as amended)

The MBTA was described in Section 3.5.3.1.2, *Migratory Bird Treaty Act*.

3.5.4.1.5 BLM Policies

As part of their efforts to protect ecological values, including the protection and enhancement of wildlife forage and habitat, the BLM confers special status to species designated by the State as Threatened or Endangered, BLM-Sensitive Species, and those species listed under the ESA (BLM, 2001b; 2001c). It is BLM policy to use all methods and procedures necessary to improve the condition of Special Status Species and their habitats to a point where their special status recognition is no longer warranted. Sensitive species are taxa that are not already included as BLM Special Status Species under the ESA or State regulations. BLM's Nevada Sensitive Species list identifies 246 species of concern, including 31 mammals, 33 birds, 25 fish, 26 snails, 25 fish, and 106 plants. The Sensitive species designation is normally used for species that occur on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management. The BLM 6840 manual provides for BLM to implement management plans that conserve candidate and Bureau-sensitive species and their habitats, and to ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed under the provisions of the Endangered Species Act. The manual also provides factors by which a native species may be listed as "sensitive." Sensitive species are afforded the same level of protection as federal Candidate species (BLM Manual 6840.06 C, that is "to ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed").

3.5.4.1.6 State of Nevada

The State of Nevada does not have a list of designated threatened and endangered species. However, NDOW does have a list of "protected" species, which are designated because of a reduction in all or portions of their range within the State of

Nevada. These species are designated and protected under the authority of NRS 501.100- 503.104 for wildlife and NRS 527.260-527.300 for plants. The State of Nevada has designated 33 species as either Protected or Sensitive. These species are treated as federal Candidate species whenever found on BLM property.

3.5.4.2 Analysis Area and Methodology

The area of analysis consists of those locations where special status species may potentially occur within the proposed project areas for the transmission lines, distribution lines, water pipelines, well sites, substations, power plant sites, rail spur ROWs, NNR upgrade to Shafter, and all other ancillary facilities that may be constructed as part of the proposed project. Species with the potential to occur within the project area were identified from various sources, including BLM and NDOW species lists, Animals of Nevada fact sheets online, NNHP data requests, the FWS letter received on July 19, 2004 (Appendix D, *U.S. Fish and Wildlife Service Correspondence*), and observations made during biological field surveys in 2005.

Surveys for special status species were as follows:

- Greater sage-grouse (*Centrocercus urophasianus)*. Aerial surveys were conducted in April 2005.
- Ferruginous hawks. Nest surveys were conducted in May 2005.
- Aquatic species (springsnails, northern leopard frogs, relict dace). Surveys were conducted the last 2 weeks of September 2005.

Survey and habitat assessment results were used to evaluate potential direct and indirect effects to all special status species that potentially occur in the project area.

Ground water modeling was used to predict the extent of drawdown resulting from the Proposed Action and Alternative 1 pumping and to evaluate potential indirect effects of project operations on aquatic spring habitats. Approximately 45 springs in Steptoe Valley were determined to be in the general region potentially affected by project ground water pumping (see Section 4.4, *Ground Water Resources*). These springs were examined to determine if endemic springsnail species of concern were present. Habitats of special status species that may not lie within the project area, but which may be indirectly impacted or impacted as a result of cumulative effects, are also included in this analysis.

In addition to special status species surveys, habitat assessments were conducted for BLM special status plant species and for the BLM and State Sensitive pygmy rabbit. Habitat assessments focused on the ability of a landscape to provide cover, forage, water, and space requirements. Habitat assessments were based on field observations, vegetation community mapping, presence and extent of existing disturbance, BLM fire data, and other existing resource information provided by NDOW, FWS, and BLM. Signs and occurrences of special status species were recorded during vegetation community field studies and weed inventories. Species lists provided by NDOW, BLM, and FWS were examined prior to field surveys to familiarize field staff with species of special concern that may occur within the project area.

3.5.4.3 Descriptions of Special Status Species

3.5.4.3.1 Federally Listed Species

The FWS was contacted to obtain information on Threatened, Endangered, Proposed, and Candidate species listed or proposed for listing under the ESA that have the potential to occur in the project area. In correspondence dated July 19, 2004, the FWS named two federal species of concern, the Threatened bald eagle (*Haliaeetus leucocephalus*) and the Candidate yellow-billed cuckoo (*Coccyzus americanus*), as having the potential to occur in the project area. The bald eagle has full protection under the ESA and is also protected under the Bald and Golden Eagle Protection Act of 1940 and the MBTA. The yellow-billed cuckoo is a Candidate species and, therefore, does not receive legal protection under the ESA. However, it is protected under the MBTA. A Biological Assessment was prepared to address the bald eagle and yellow-billed cuckoo and was submitted to the FWS as part of the ESA Section 7 consultation process.

The FWS also named the State Threatened Monte Neva paintbrush (*Castilleja salsuginosa*), the BLM and NDOW sensitive greater sage-grouse (*Centrocercus urophasianus*), and the pygmy rabbit (*Brachylagus idahoensis*), which is currently being petitioned for listing on the ESA, as species of special concern that have the potential to occur in the project area. The FWS scoping letter, received in 2004, also expressed concerns for macroinvertebrates that may occur in springs and springbrooks (springsnails, caddisflies, beetles, true bugs, and crustaceans).

Bald Eagle

The bald eagle is listed as a Threatened species under the ESA. In July 1999, the FWS proposed to remove the bald eagle from the list of Threatened and Endangered species (64 FR 36454). In 2006, the FWS re-opened the public comment period because of new information on the proposal to delist. Delisting goals in the Pacific States Bald Eagle Recovery Region have been met since 1995 (64 FR 36454). In addition, this species is protected under the Bald and Golden Eagle Protection Act of 1940.

White Pine County, Nevada, is located in Recovery Unit 36 (Antelope Valley) of the Pacific States Bald Eagle Recovery Region (FWS, 1986). There are no breeding recovery goals for nesting bald eagles in Unit 36. The primary management direction identified in the Pacific States Bald Eagle Recovery Plan for Unit 36 is to identify and protect wintering areas (FWS, 1986). Prior to 1985, the last documented nesting activity in Nevada was in 1866 at Pyramid Lake (Linsdale, 1936 as cited in FWS, 1986). During 1985, a nesting attempt occurred on BLM land along Salmon Falls Creek in Elko County (FWS, 1986). No nesting territories are known to occur in White Pine County, Nevada (Williams, 2006).

The majority of bald eagle use in Nevada occurs during the winter. As of 1985, the wintering population in Unit 36 was estimated to be 15 eagles (FWS, 1986).

The majority of the 85 bald eagle observations reported from White Pine County between 1970 and 2004 were of one to two birds. The maximum number of eagles detected at any one location was five (NDOW, unpublished data). Detections have been reported in virtually all months of the year but most have been made from December to March. These bald eagle sitings occurred at and adjacent to Basset Lake, the Ely airport, Butte Valley, Jakes Valley, near Cherry Creek, around McGill, and in Steptoe Valley. The project area does not contain suitable breeding or winter roosting habitat for this species. No known occurrences of bald eagle nesting or roosting sites exist within the immediate project area.

Appendix C, *Biological Resources Supplemental Information*, contains additional life history information on the bald eagle.

Yellow-Billed Cuckoo

The yellow-billed cuckoo is a Candidate for listing as Threatened or Endangered in its range west of the Rocky Mountains (66 FR 38611). Nevada has listed the yellow-billed cuckoo as State Rank S1 Nevada State Protected because it is considered critically imperiled because of extreme rarity, imminent threats, and/or biological factors. Under such a designation, the protected species may not be killed, captured, shot at, trapped, wounded, possessed, collected, seined, or netted, nor can a person attempt to do any of these activities. NDOW estimated the summer population of yellow-billed cuckoo is between 20 and 30 birds statewide.

No occurrences of yellow-billed cuckoos have been recorded within the project area and it is highly unlikely that this species occurs in White Pine County.

Appendix C, *Biological Resources Supplemental Information*, contains additional life history information on the yellow-billed cuckoo.

3.5.4.3.2 State Protected Wildlife Species

The NDOW is the state agency responsible for the restoration and management of fish and wildlife resources and the protection of species designated as Protected or Threatened under the authority of NRS 501.100-503.104 for wildlife and NRS 527.260-527.300 for plants. Table 3.5-5 lists state-protected wildlife species that occur or have the potential to occur in the project area.

Bats

Seven species of bats are protected under Nevada State Law or are BLM-Sensitive species. Six of the seven Sensitive species have the potential to occur in the project area and three of these six species have recorded occurrences in the project area, according to NNHP elemental occurrence records. Bat species of State concern are also species of special concern for the FWS and the BLM. The exact locations of all bat records are considered to be sensitive information and were not provided by NNHP for analysis. The spotted bat, a former Candidate species, has been recorded once within the project vicinity in 1982, according to the NNHP database. There was one recorded occurrence of Townsend's big-eared bat in 1992, and another in 1993. The pallid bat was observed in the project area in 1992. Three additional bat species (fringed myotis, California myotis, and western small-footed myotis) are known to have suitable habitat in the project area, as documented by the NNHP.

Breeding and roosting habitat exists for bat species within portions of the project area. Such habitat occurs primarily in the Egan Range portion of the transmission line ROW where rocky cliffs and outcroppings, small crevices, caves, and pinyon-juniper stands are found. Wetland habitats along Duck Creek, aquatic sites associated with springs, and the extensive sagebrush shrubland provide foraging habitat for bat species within the project area.

Appendix C, *Biological Resources Supplemental Information*, contains additional life history information on bats.

Birds

In addition to having special status, the avian species listed in Table 3.5-5 are protected under state law as well as federal law as dictated under the MBTA. With the exception of the European starling (*Sturnus vulgaris*) and the house sparrow (*Passer domesticus*), all other avian species that occur within the project area are protected under the MBTA.

TABLE 3.5-5

BLM and State (NDOW) Wildlife Species of Concern Potentially Occurring in the White Pine Energy Station Project Area

Scientific Name	Common Name	Status	Preferred Habitat	Recorded Occurrence in Project Area or Vicinity (Y/N)	Suitable Habitat in Project Area (Y/N)
Mammals					
Brachylagus idahoensis	Pygmy rabbit	NDOW-SSC BLM-S	Old growth sagebrush in sandy soils	Yes	Yes
Microdipodops megacephalus	Dark kangaroo mouse	NDOW-P	Sagebrush and alkali habitats, sandy soils	No	Yes
Sorex preblei	Preble's shrew	BLM-S	Sagebrush	No	Yes
Bats					
Myotis thysanodes	Fringed myotis	NDOW-P BLM-S	Caves, rocks, cliffs, riparian areas	No	Yes
Corynorhinus townsendii	Townsend's big-eared bat	NDOW-P/S BLM-S	Caves and crevices in rocks	Yes	Yes
Antrozous pallidus	Pallid bat	NDOW-P BLM-S	Rocky outcrops and ledges near water	Yes	Yes
Euderma maculatum	Spotted bat	NDOW-P/S BLM-S	Crevices, ledges, near water	Yes	Yes
Myotis californicus	California myotis	BLM-S	Rocky outcrop, snags, crevices, near water	No	Yes
Myotis ciliolabrum	Western small-footed myotis	BLM-S	Cracks and crevices	No	Yes
Birds					
Centrocercus urophasianus	Greater sage-grouse	NDOW-SSC BLM-SSC	Sagebrush	Yes	Yes
Aquila chrysaetos	Golden eagle	NDOW-P BLM-S	Shrub steppe, native grassland, riparian areas	Yes	Yes
Accipiter gentiles	Northern goshawk	NDOW-P BLM-S	Forest habitat generalists	No (migrants in south Schell Range)	Yes

TABLE 3.5-5

BLM and State (NDOW) Wildlife Species of Concern Potentially Occurring in the White Pine Energy Station Project Area

Scientific Name	Common Name	Status	Preferred Habitat	Recorded Occurrence in Project Area or Vicinity (Y/N)	Suitable Habitat in Project Area (Y/N)
Buteo regalis	Ferruginous hawk	NDOW-P BLM-S	Plains, prairies, pinyon-juniper stringers in sagebrush communities	No current (1 migrant observation in north Egan Range)	Yes
Buteo swainsoni	Swainson's hawk	NDOW-P BLM-S	Plains, range, hills, sparse trees	No (migrants in south Schell Range and south Egan Range)	Yes
Athene cunicularia	Burrowing owl	BLM-S	Salt desert scrub, agricultural lands	No	Yes
Agelaius tricolor	Tricolored blackbird	BLM-S	Wetlands with cattails/marshes	No	Yes
Lanius ludovicianus	Loggerhead shrike	NDOW-S BLM-S	Open country, savannas, desert scrub, and occasionally in open juniper woodlands	No	Yes
Spizella breweri	Brewer's sparrow	NDOW-S	Sagebrush/Montane pinyon-juniper woodland	No	Yes
Oreoscoptes montanus	Sage thrasher	NDOW-S	Sagebrush	Yes	Yes
Asio otus	Long-eared owl	NDOW-P BLM-S	Woodlands, coniferous forests	No	Yes
Asio flammeus	Short-eared owl	BLM-S	Prairie, sagebrush shrubland	No	Yes
Baeolophus griseus	Juniper titmouse	BLM-S	Mature pinyon-juniper woodlands	No	Yes
Falco mexicanus	Prairie falcon	NDOW-P BLM-S	Mountainous grasslands, open hills	Yes	Yes
Falco peregrinus	Peregrine falcon	NDOW-P BLM-S	Open country, cliffs	No	Yes
Grus canadensis	Sandhill crane	BLM-S	Prairies, fields, marshes	Yes	Yes
Icteria virens	Yellow-breasted chat	BLM-S	Brushy tangles, stream sides	No	Yes-migrant
Ixobrychus exilis	Least bittern	BLM-S	Freshwater marshes, ponds	No	Yes
Gymnorhinus cyanocephalus	Pinyon jay	BLM-S	Pinyon-juniper, sagebrush	Yes	Yes

TABLE 3.5-5

BLM and State (NDOW) Wildlife Species of Concern Potentially Occurring in the White Pine Energy Station Project Area

Scientific Name	Common Name	Status	Preferred Habitat	Recorded Occurrence in Project Area or Vicinity (Y/N)	Suitable Habitat in Project Area (Y/N)
Numenius americanus	Long-billed curlew	BLM-S	Salt marsh, rangeland, high plains	Yes	Yes
Pooecetes gramineus	Vesper sparrow	BLM-S	Meadows, fields, prairies, roadsides	No	Yes
Vireo vicinior	Gray vireo	BLM-S	Brushy mountain slopes, mesas, scrub oak, junipers	No	Yes
Dolichonyx oryzivorus	Bobolink	BLM-S	Hayfields, meadows, marshes	No	Yes
Reptiles					
Phrynosoma douglassii	Short-horned lizard	BLM-S	Basin shrub habitats on loose soils	Yes	Yes
Amphibians					
Rana pipiens	Northern leopard frog	NDOW-P BLM-S	Heavily vegetated freshwater, brackish marshes, and moist fields from desert to mountain meadow	Yes	Yes
Rana luteiventris	Columbia spotted frog	NDOW-P	Mountains near cold streams and lakes	No	Yes
Insects					
Polites sabuleti nigrescens	Dark sandhill skipper	BLM-S	Alkali meadows, sand dunes, sagebrush flats, wet meadows	Yes	Yes
Cercyonis pegala pluvialis	White River wood nymph	BLM-S	Wetland	Yes	Yes
Euphydryas editha koreti	Koret's checkerspot	BLM-S	Occurs above approximately 12,000 feet elevation; oviposits exclusively on *Castilleja lapidicola*	No	
Phyciodes pascoensis arenacolor	Steptoe Valley crescentspot	BLM-S	Wetland	Yes	Yes
Euphilotes bernadino minuta	Baking powder flat blue	BLM-S	Unknown	No	

TABLE 3.5-5

BLM and State (NDOW) Wildlife Species of Concern Potentially Occurring in the White Pine Energy Station Project Area

Scientific Name	Common Name	Status	Preferred Habitat	Recorded Occurrence in Project Area or Vicinity (Y/N)	Suitable Habitat in Project Area (Y/N)
Fish					
Relictus solitarius	Relict dace	NDOW-P/S BLM-S	Isolated springs within four intermountain valleys in northeastern Nevada	Yes (3 sites within hydrologic basin)	Yes
Springsnails					
Pyrgulopsis serrata	Northern Steptoe springsnail	NNHP-S1	Springs	Yes (10 sites within hydrologic basin)	Yes
Pyrgulopsis sulcata	Southern Steptoe pyrg	NNHP-S1	Springs	No	Yes

BLM-S = BLM-Sensitive; P/S = State (NDOW) Protected; SSC = State Species of Special Concern; NNHP-S1=Nevada Natural Heritage Program-Critically imperiled because of extreme rarity, imminent threats, and/or biological factors.

Sources: NDOW 2005 Protected Species List and the Nevada BLM-Sensitive Species List; Vigg (1982)I Hawkwatch International (2005) spring and fall migration surveys; Britten et al. (1992)

One of the major vegetation community types within the project area is sagebrush shrublands. Sagebrush habitat is of high maintenance importance because several Special Status avian species, including Brewer's sparrow, greater sage-grouse, and sage thrasher, are dependent on it. Sage thrasher and sage-grouse were documented in the project area in the western portion of Steptoe Valley and in Butte Valley. The pinyon-juniper woodlands along the proposed transmission line ROW in the Egan Range and Butte Valley provide habitat for species such as loggerhead shrike, pinyon jay, juniper titmouse, gray vireo, long-eared owls, and ferruginous hawk. The loggerhead shrike and pinyon jay were documented during surveys conducted within the project area in summer 2005.

The project area contains wetland habitats and borders patches of agricultural land irrigated for cattle/horse grazing. These areas could provide habitat for species that prefer mesic habitats such as sandhill crane, bobolink, short-eared owl, vesper sparrow, long-billed curlew, and yellow-breasted chat.

Sandhill cranes were observed within the project area along portions of Duck Creek. The large wetland complex located near the proposed rail spur alignment associated with Duck Creek contains habitat for waterfowl and other migratory species of concern. The large number of springs within Steptoe Valley have also created wetlands throughout and adjacent to the project area. These habitats could support species such as the least bittern.

Ferruginous Hawk

The ferruginous hawk is a BLM and state species of concern. BLM and NDOW are concerned about the survival of this species because of the continued increase in seismic and geophysical (energy and mineral) exploration within the Ely District (Perkins and Lindsey, 1983). BLM surveys conducted in 1982 recorded 27 total ferruginous hawks within the entire Ely District.

Appendix C, *Biological Resources Supplemental Information,* contains additional life history information on ferruginous hawks.

BLM reports that ferruginous hawk nesting and habitat areas occur west of the project area in Butte Valley and east of U.S. 93. Within the BLM Ely District, the greatest percentages of ferruginous hawk nest sites are within juniper stringers on big sagebrush or black sagebrush knolls and within 2 miles of white sage (Perkins and Lindsey, 1932). No ferruginous hawk nests have been previously recorded in the project area.

Existing data sets for ferruginous hawks were deemed incomplete, so the project area was surveyed for nesting sites in May 2005. Surveys were conducted on May 17, 18, 19, and 20, 2005, between 7:00 a.m. and 12:00 to 12:30 p.m. The only project feature that contained suitable ferruginous hawk nesting habitat was the proposed transmission line corridor. Surveyors walked suitable habitat within the transmission line corridor (including the 0.5-mile buffer) and searched for raptors, nests, or raptor sign such as whitewash. Hawkwatch International (2005) documented one ferruginous hawk in the northern portion of the Egan Range during fall migration and one in the same region during spring migration.

No ferruginous hawks were detected in or near the project area in 2005. However, a single ferruginous hawk was observed perched on a fence post along Alternate Highway 93 north and east of the proposed project area. The project area contains suitable foraging and nesting habitat for the ferruginous hawk. In the vicinity of the proposed transmission lines, the western side of the Egan Range in Butte Valley has what appeared to be highly suitable habitat for ferruginous hawk nesting because of the presence of multiple juniper stringers and the expanse of sagebrush communities. During surveys, three stick-nests located in juniper trees were noted in this portion of the proposed transmission line alignments. All three of these nests were inactive and had no evidence of recent use. Two of the nests were 2 to 3 feet in diameter and could have potentially been ferruginous hawk nests. The third nest, which was approximately 16 to 18 inches in diameter, most likely belonged to an owl or magpie. The two potential ferruginous hawk nests had fallen apart and appeared to have been inactive for at least the past year.

Other Raptor Species of Concern

The western portion of the project area, which includes the Egan Range, contains pinyon-juniper woodlands that could provide nesting habitat for northern goshawks, Cooper's hawks, sharp-shinned hawks, golden eagles, and Swainson's hawks. The BLM has mapped cliff nesting habitat in the Egan Range near the crossing of the proposed transmission lines. Spring and fall migration surveys conducted by Hawkwatch International (2005) in the Egan and Schell Ranges surrounding Steptoe Valley documented northern goshawks, Swainson's hawks, and ferruginous hawks among the 17 species of raptors observed.

The raptor species observed during surveys for ferruginous hawks included one pair of golden eagles, a number of kestrels, a pair of northern harriers (believed to be nesting on the east side of the Egan Range), ravens, and several turkey vultures.

A pair of golden eagles was observed on several occasions soaring over and adjacent to the project area in Steptoe Valley, Butte Valley, and the Egan Range. Nearby rock ledges were examined with binoculars but no nest was found. It is possible that the pair nests south of the project area beyond the area covered by the surveys. A pair of northern harriers was also seen during biological surveys in May 2005. This pair was observed in Steptoe Valley along the proposed transmission line ROW, distribution line alignments, and water supply system. The pair was observed soaring above agricultural fields, sagebrush habitats, and salt desert scrub habitats, but no nests were found. A prairie falcon was observed perching on a juniper tree on the west side of the Egan Range in Butte Valley during the special status plant habitat assessment in June 2005.

Northern goshawks and peregrine falcons were not observed nor were any nests/eyrie found during biological survey work. BLM data show a number of northern goshawk nests and occurrences to the west in Butte Valley and east of U.S. 93 but none near the project area. A goshawk was previously documented by the BLM 1 to 1.5 miles to the west of the proposed transmission lines and southwest of the proposed plant site. Hawkwatch International (2005) recorded three northern goshawks during fall migration and one during spring migration in the Steptoe Valley region.

In Nevada, sparsely vegetated habitats preferred by burrowing owls are predominantly found in the salt desert scrub habitat type, which occupies roughly 8.9 million hectares of valley bottoms within the Great Basin physiographic region (FWS, 2003). Sagebrush habitat is also utilized when artificial burrows are placed in moderately dense sagebrush communities. Burrowing owls will also breed around the fringes of agricultural lands and use crop and pasture lands for foraging during the breeding season (FWS, 2003). This species rarely winters in northern Nevada and sparingly in the southern part of the state. According to the Nevada Breeding Bird Atlas, burrowing owls have been confirmed or suspected breeding in nearly every county in Nevada. The species winters most frequently in the southern half of Nevada, but has been recorded throughout the state during all months (FWS, 2003). The project area contains salt desert scrub habitat, however, there have been no previous occurrences of this species in the project area, and no burrowing owls were observed in the project area during biological field surveys conducted in 2005.

Greater Sage-Grouse

The greater sage-grouse inhabits sagebrush ecosystems in the western U.S. Because of the sage-grouse's reliance on sagebrush communities for nesting, brooding, foraging, and winter/fall cover habitat requirements, this species is considered sagebrush obligate. Obligate species are defined in the Greater Sage-Grouse Conservation Plan for Nevada and Eastern California 2004 (NDOW, 2004b), as those species that are restricted to certain habitats or to limited conditions during one or more seasons of the year to fulfill their life requirements. The sage-grouse was denied listing under the ESA on January 7, 2005. The greater sage-grouse is still a species of concern for the FWS, the State of Nevada, and the BLM. It is now under state and federal land management agencies' jurisdictions to manage this species to prevent the need for future listing.

Appendix C, *Biological Resources Supplemental Information,* contains additional life history information on sage-grouse.

Sage-Grouse Occurrence in Project Area

Aerial and ground-based sage-grouse surveys were conducted in the project area and vicinity in spring of 2005 by EDAW, BLM, and NDOW. Aerial surveys were conducted on April 2 and 3, 2005. The survey team consisted of a biologist from NDOW, an experienced sage-grouse survey pilot from El Aero Services, and a natural resource specialist with EDAW, Inc. Surveys began at approximately 5:15 to 5:20 a.m. and concluded by 8:30 to 8:45 a.m. both days. Surveys were conducted in suitable habitat areas within the SWIP corridor (a 2-mile-wide corridor), the proposed water pipeline and distribution line corridors (a 2-mile-wide buffer), east of U.S. 93 and within Steptoe Valley, the power plant proposed and alternative sites, well sites, and rail spur ROWs. To ensure that all project features were covered, Steptoe Valley was surveyed from east to west in areas with suitable habitat to achieve maximum coverage of potential habitat areas. Historic lek locations were examined to determine if any sage-grouse were active in portions of Butte Valley and Steptoe Valley. Data from the BLM and NDOW indicated that as of 2005, there were 21 lek sites in Steptoe and Butte Valleys (Table 3.5-6). However, no sage-grouse leks or individual sage-grouse were identified in any portion of the project area during aerial surveys. An active lek was identified approximately 3 to 5 miles west of the SWIP corridor within Butte Valley and is labeled as Red Pepper Butte East lek. Ground-based surveys conducted by the BLM during March, April, and May 2005 positively identified seven active leks that were not seen during aerial surveys (Table 3.5-6). Six of the active leks were within 2 miles of a Proposed Action or Alternative 1 project feature.

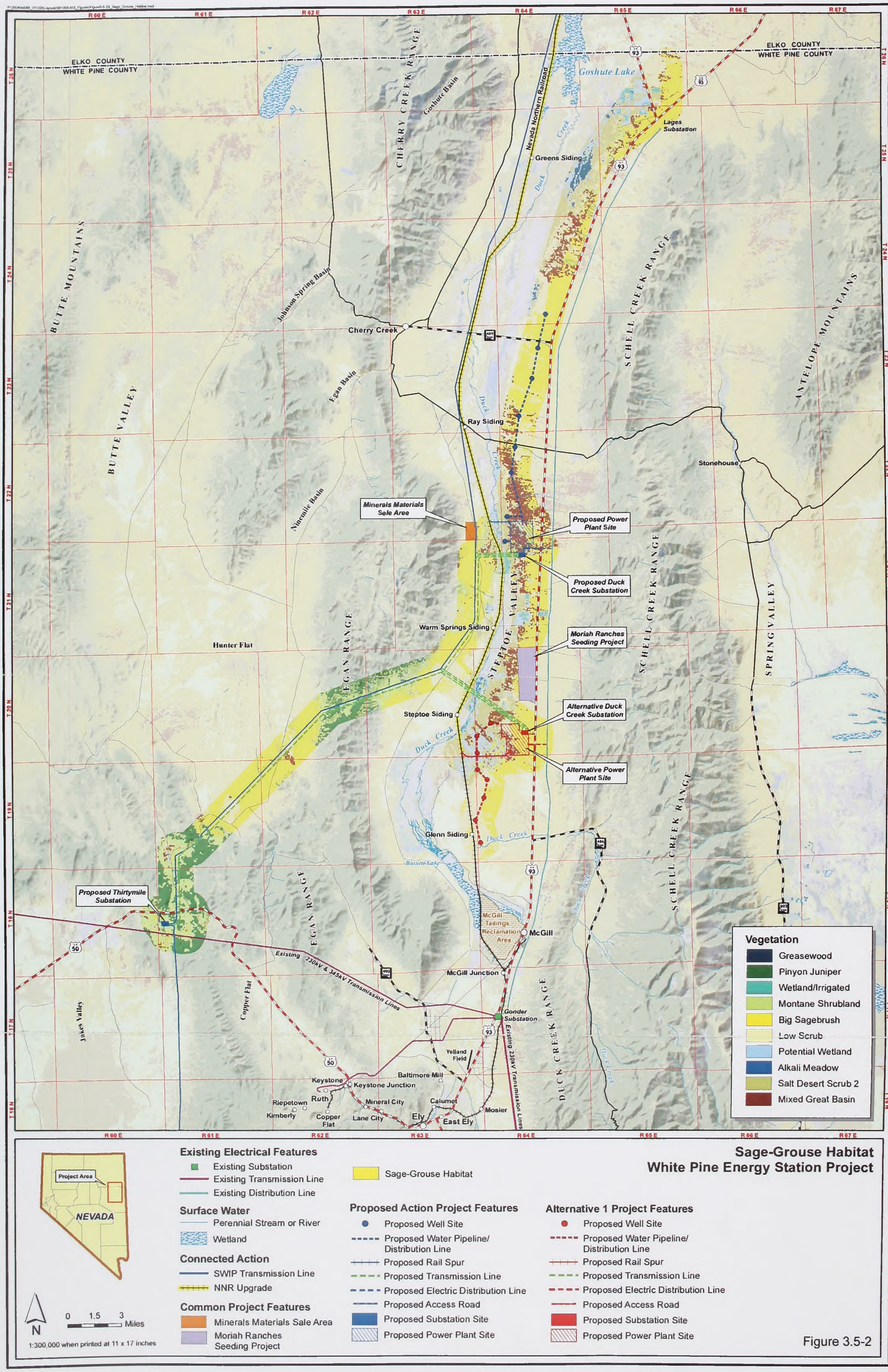
Surveys were conducted again in spring 2006 by BLM and NDOW biologists. Five of the seven leks found active in 2005, were active again in 2006. Log Canyon North lek (within the ROW) and Red Pepper Butte East (outside the ROW) were active in 2005, but were not active in 2006.

Based on ground-based surveys by the BLM and observations made in the project area incidental to biological surveys in 2005 and 2006, Steptoe and Butte Valleys provide winter, summer, breeding, and nesting habitat for the greater sage-grouse. Historical data also indicate use of the area. A grouse brood was found in the wet meadows of Cold Spring in 1995 (Haskins, 1995). Grouse sign was noted near several of the small isolated springs along the western edge of Steptoe Valley. Figure 3.5-2 displays potential sage-grouse habitat.

TABLE 3.5-6

Sage-grouse Leks Within the Survey Corridor (2-mile-wide-buffer) of the Project Area in Steptoe and Butte Valleys

Lek Name	Active/Not Active in 2006	Active/Not Active in 2005	Within 2-Mile-Wide Project Buffer? (Yes/No)	Approximate Distance from 2-Mile-Wide Project Buffer (if not found in buffer zone)
Log Canyon North	Not active	Active	Yes-2,085 feet from proposed centerline	0
Mud Spring North	Unknown	Not active	Yes	0
Raiff Siding	Not active	Not active	Yes	0
Glenn Siding	Not active	Not active	Yes	0
Butte Valley 2	Not active	Not active	Yes	0
Butte Valley 3	Not active	Not active	Yes	0
Madelina Springs	Active	Active	No-6.1 miles to proposed well site	4.2 miles
Cherry Creek South	Active	Active	No-6.7 miles to proposed water pipeline	5.7 miles
Borchert Creek North	Active	Active	No-4.3 miles to proposed pipeline	3.3 miles
Whiteman Creek	Active	Active	No	1.5 miles from proposed distribution line
Water Canyon Bench	Not active	Not active	No	Less than 0.25 mile from transmission line ROW
Dry Canyon Road	Not active	Not active	No	1.75 miles
Dry Canyon	Not active	Not active	No	0.5 mile
Dry Canyon 2	Active	Active	No-2.2 miles from proposed plant site	1 mile
Dry Canyon 3	Not active	Not active	No	Less than 1/4 mile
Steptoe	Not active	Not active	No	2.75 miles
Butte Valley South	Not active	Not active (unknown)	No	1.5 to 2 miles
Currie Canyon	Not active	Not active	No	2 miles
Tehama Creek North	Not active	Not active	No	1.75 to 2 miles
Timber Creek	Not active	Unknown	No	2 miles east of U.S. 93
Red Pepper Butte East	Not active	Active	No	4.5 miles



Sage-Grouse Habitat
White Pine Energy Station Project

Figure 3.5-2

Historical data provided by the BLM and NDOW show no leks immediately adjacent to the NNR, but do indicate leks on the western side of Goshute Valley. Separate environmental documentation has been prepared by White Pine County for the NNR action.

Pygmy Rabbit

The pygmy rabbit is the smallest native rabbit in North America and is a BLM-Sensitive species and a State species of special concern. This species is also a former Category 2 Candidate Species.

Pygmy rabbit habitat was assessed in the project area during 2005 to evaluate potential impacts to this species and their habitat. Data requests from the NNHP showed three occurrences of pygmy rabbits in the project area in 2003. NNHP-recorded occurrences were in Steptoe Valley, Butte Valley, and in a draw in the Egan Range. Following data collection activities, habitat assessment surveys were completed using the protocol created in part by a member of the BLM Boise, Idaho District (Ulmschneider, 2004). Suitable pygmy rabbit habitat was identified along various portions of the proposed water pipeline alignments. Stands of big sagebrush coupled with sandy soils along the alternative water pipeline ROW provide the highest quality habitat for pygmy rabbits in the project area. Several pygmy rabbits were observed along the southern end of the proposed water pipeline alignment during habitat assessment surveys conducted in 2005.

Appendix C, *Biological Resources Supplemental Information,* contains additional life history information on pygmy rabbits.

Small Mammals

Suitable habitat exists in the project area for the dark kangaroo mouse. There are no recorded occurrences of this species within the project area or White Pine County. This mouse can be found in loose sands and gravels in shadscale scrub, sagebrush scrub, and sand dunes. Portions of the proposed water pipeline alignments are just west of dune habitat, and areas along the southern portion of the proposed pipeline corridor contain the sandy soils and big sagebrush habitat that this species, as well as the Preble's shrew, require. These species are nocturnal so there were no observances of them during biological field surveys. There are no recorded occurrences of these species in the project area, although suitable habitat is present.

Amphibians

Northern leopard frogs inhabit heavily vegetated freshwater, brackish marshes, and moist fields from desert to mountain meadows. Northern leopard frogs have sensitive status as a result of habitat loss, fungal infections, and competition with non-native fish and amphibians throughout their range. The Columbia spotted frog is also a BLM-Sensitive species that is known to occur in White Pine County (NNHP, 2005b). This frog typically inhabits springs, seeps, meadows, marshes, ponds, and streams where there is abundant vegetation (FWS, 2005). Populations of the Great Basin Columbia spotted frog have declined in recent years because of grazing, spring development, water diversion, trail construction, and fires in riparian corridors (FWS, 2005).

Aquatic habitat surveys conducted in April and September 2005 documented northern leopard frogs at four springs along an irrigation ditch flowing from Grass Spring, and in a small stream near the alternative water pipeline ROW. The latter observation was the only one located in the immediate vicinity of a proposed or alternative project facility. Duck Creek and its associated wetlands and many of the 45 Steptoe Valley springs examined during aquatic habitat surveys in 2005 provide potential habitat for northern leopard frogs and Columbia spotted frogs. Both of these frog species require water bodies that persist through the spring and early summer for breeding and tadpole development. Because of the ephemeral nature of the majority of surface waters in Steptoe and Butte Valleys, suitable breeding habitat is limited for either species.

Reptiles

A number of lizards were identified and observed throughout the project area during surveys for noxious/invasive weeds and special status plant habitat. The short-horned lizard was the only reptile species of concern identified during biological surveys. Short-horned lizards occur in diverse habitats over their broad geographic range. Habitats within the project area include Short-Grass Prairie, Sagebrush, Semi-Desert Shrubland, and Pinyon-Juniper Woodland. This species was commonly observed within the project area, particularly along the proposed and alternative water pipeline alignments.

Insects

The project area contains suitable habitat for several BLM-designated insects of special concern. There are five species of butterflies with the potential to occur in the project area, according to the NNHP 2005 species list for White Pine County. These include the White River wood nymph, baking powder flat blue, dark sandhill skipper, Koret's checkerspot, and Steptoe Valley crescentspot. These species are endemic to the Great Basin and are a high conservation priority for the BLM. The NNHP databases show three occurrences of sensitive butterfly species in the project area. These include four occurrences of the White River wood nymph, two occurrences of the dark sandhill skipper, and three occurrences of the Steptoe Valley crescentspot. These occurrences are at least 5 years old or more in some cases. There are no records for other Sensitive species of butterflies within the project area.

The White River wood nymph, dark sandhill skipper, and Steptoe Valley crescentspot occurrences were near or adjacent to Duck Creek, Basset Lake, and Steptoe Slough in Steptoe Valley. The majority of occurrences were within 1 to 6 miles of the proposed water pipeline ROW and transmission line ROW east of the Egan Range. Suitable habitat may exist for these species along the proposed water pipeline alignment, rail spur, and distribution line in the southern end of the project area.

Aquatic Species of Special Concern

Existing information and field surveys were used to describe the occurrence of sensitive fish and aquatic springsnails. Aquatic surveys were conducted at 45 springs in Steptoe Valley and along segments of Duck Creek within 200 feet of the Proposed Action and Alternative 1 project features to determine the presence of relict dace and springsnails (see Figure 3.4-5). The surveys were conducted by an aquatic expert from the Desert Research Institute with assistance from EDAW ecologists in September 2005 and consisted of visual searches of the aquatic habitat for fish and amphibians, and straining vegetation and substrate samples for invertebrates. Survey methods are summarized in the "Northern Steptoe

Valley Springsnail Surveys, White Pine County, Nevada" (Sada, 2006).

The only fish species listed in Table 3.5-5 with suitable habitat in the project area is the relict dace. The relict dace is an NDOW Protected Species and a BLM-Sensitive species. The species naturally occurs in isolated springs in Steptoe, Butte, Ruby, and Goshute Valleys, and as an introduced species in Spring Valley in northern Nevada (Vigg, 1982; Stein and Salisbury, 1994). Sites supporting relict dace have water temperatures that do not vary substantially; the maximum water temperature recorded at a relict dace site is 25 degrees Celsius (Vigg, 1982). The primary threats to this species are degradation of habitat, exotic species introductions, and localized extirpation. The most recent previous surveys in the analysis area were conducted in 1994 (Stein and Salisbury, 1994) and 1995 (Haskins, 1995). NDOW summarized relict dace sites from surveys conducted in 1994 and 1995 by NDOW and in previous years by other investigators and determined that populations of relict dace occurred at 20 sites within Steptoe Valley and seven springs in northern Butte Valley near the White Pine-Elko County line (Table 3.5-7). Historical relict dace sites in Steptoe Valley are on the western side of the valley between Basset Lake and the Steptoe-Goshute Valley boundary. Duck Creek has suitable habitat for this species, but introductions of northern pike (predator) and carp (compete for habitat) make their occurrence unlikely (Haskins, 1995; Crookshanks, 2005). Potential relict dace occurrences were observed north of the project area on private property. No relict dace were observed in Duck Creek during field surveys conducted in 2005.

One species of endemic springsnail (the Northern Steptoe springsnail [*Pyrgulopsis serrata*]) was documented at 10 springs in the western portion of Steptoe Valley during the aquatic surveys. All of the springs with springsnails occurrence were generally larger (longer springbrooks and greater discharge) than the average size springs surveyed within the project area. These populations of *Pyrgulopsis serrata* were previously unrecorded. Prior to these surveys, this species was known to occur only in three springs, all occurring on the west side of Steptoe Valley.

TABLE 3.5-7

Historical Relict Dace Occurrence in Steptoe and Butte Valleys

Site	Site Name (NDOW 1994/1995)	Year Relict Dace Documented
Steptoe Valley		
RD1	3-C Ranch / Steptoe Valley WMA	1938, 1969, 1972
RD2	Georgetown Ranch	1938, 1991-1992, 1994
RD2A	Murray Creek	1991, 1994
RD3	Dairy Ranch Springs / McGill Pool	1938, 1979, 1991-1992, 1994
RD3A	McGill Springs Road Crossing Below Dairy	1994
RD3B	Midpoint of McGill Springs Outflow	1994
RD3C	Spring West of McGill Pool	1994
RD3D	West End McGill Springs Outflow	1994
RD4	Tailings Creek at Pumphouse	1994

TABLE 3.5-7

Historical Relict Dace Occurrence in Steptoe and Butte Valleys

Site	Site Name (NDOW 1994/1995)	Year Relict Dace Documented
RD5B	Lusetti Ranch / Grass Springs 3	1994
RD5C	Lusetti Ranch / Grass Springs 4	1962, 1977, 1979, 1980, 1994
RD6	Steptoe Ranch 1	1991
RD6B	Steptoe Ranch 3	1938, 1962, 1979, 1980, 1991, 1994
RD6C	Steptoe Ranch 4	1938, 1962, 1979, 1980, 1994
RD6D	Steptoe Ranch 5	1938, 1962, 1979, 1980
RD7	Cordano / Murphy / Dolan Ranch 1	1938, 1979, 1980
RD7A	Cordano / Murphy / Dolan Ranch 2	1938, 1979, 1980, 1995
ND1	Ruth Pond	1965, 1979
ND3D	Duck Creek—Warm Springs	1962, 1980
ND10	Lookout Springs	1981
Butte Valley		
RD30	Odgers Creek Spring source	1942, 1979, 1980
RD30A	Odgers Creek	1942, 1979, 1980, 1991-1992, 1994
RD31	Spring northeast of Odgers Creek	1994
RD32	Quilici / Delker Spring	1934, 1979, 1980, 1991-1992, 1994
RD33	Atwood/Kirkpatrick Ranch	1938, 1942, 1962, 1979, 1980, 1991, 1994
ND30	Owens Ranch Springs	1942
ND31	Stratton / Paris / West Ranch	1942, 1962, 1979

Source: NDOW unpublished data.

3.5.4.3.3 Special Status Plant Species

Plant Species of Special Concern in White Pine County

The area of analysis for special status plant species is the same as that used for special status wildlife species. Regulations applicable to special status plants are discussed in Section 3.5.4.1, *Regulatory Framework*. The species included for analysis include federally listed and species proposed for listing as Threatened or Endangered, Candidate, Species of Concern, Nevada State Protected Species, and Nevada BLM-Sensitive Species. Also included are plant species that have "special status" designations (for example, those designated by NNHP) other than state or federal status as Threatened, Endangered, or Candidate species. Special status designations indicate species rarity, population declines, or threats to populations that may warrant special consideration or protection, which include federal species of concern, NNHP at-risk plant species, and also cactus, yucca, and Christmas trees, which are protected by Nevada state law.

This section provides information on special status plant species known or suspected to occur in the vicinity of the project area. It also includes an assessment of potential habitat and likelihood of occurrence of special status species within the project area.

A pre-field investigation for information on special status plant species occurrences in the study corridor was obtained from the FWS and the NNHP, which included BLM information to identify known occurrences and potential habitat of Threatened, Endangered, Candidate, and other special status plants that might occur in the project area. Additional information on plant species' habitat requirements and blooming periods was obtained from state (Kartesz, 1983; NNHP, 2005a) and regional (Cronquist et al., 1986-1997; Abrams, 1981) flora guides. In addition, soils were identified for the study area using the Natural Resources Conservation Service Soil Survey for White Pine County (USDA, 1998) to determine the presence of soils capable of supporting special status plants. A reconnaissance-level survey was conducted from June 11 through 17, 2005, by an EDAW botanist to assess potential habitat for special status species in the project area. No special status plant surveys were conducted as part of the potential habitat assessment. Rare plant surveys would be conducted prior to construction in suitable habitats.

The pre-field reconnaissance investigation identified 31 special status plants with the potential to occur in the project area. The list includes all species in White Pine County considered at-risk by the NNHP (NNHP, 2005b). The NNHP defines at-risk species as follows:

> *Taxa considered at-risk and actively inventoried by NNHP typically include those with federal or other Nevada agency status of Endangered, Threatened, or Sensitive, and those with Global ranks (Grank 1-3) or declining trends indicating some level of range-wide imperilment. In general, an at-risk species is any taxon whose long-term viability has been identified as a concern.*

The status and habitat requirements for special status plant species is provided in Table 3.5-8. Six of the 31 special status plant species have been documented to occur in the general vicinity of the project area, but not directly in the proposed or alternative project feature areas. The six species that have documented occurrence in the project vicinity include the following:

- Broad-pod freckled milkvetch (*Astragalus lentiginosus* var. *latus*)—two occurrences in Schell Creek Range approximately 6.6 miles east of proposed water pipeline (NNHP data)
- Monte Neva paintbrush (*Castilleja salsuginosa*)—one occurrence 1 mile east of proposed transmission line ROW
- Stalked whitlow cress (*Draba pedicellata*)—one occurrence in Egan Range 9 miles west of proposed water pipeline and 20 miles north of proposed transmission line ROW
- Pennell draba (*Draba pennellii*)—one occurrence in Egan Range and one in Schell Creek Range (both more than 7 miles from project)
- Watson goldenbush (*Ericameria watsonii*)—one occurrence in Schell Creek Range 6 miles southeast of proposed power plant site
- Nachlinger catchfly (*Silene nachlingerae*)—three occurrences in Egan Range, with nearest 4 miles from proposed transmission line ROW

Monte Neva paintbrush is a species state listed as Endangered and a federal species of concern. This species occurs at Monte Neva Hot Springs approximately 0.6 mile from the SWIP corridor in Steptoe Valley. There are nine other Monte Neva paintbrush occurrences in the Schell Range and the Egan Range; the closest of these nine occurrences to any project feature is approximately 4.5 miles in the Egan Range and 4.3 miles in the Schell Range.

Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is federally listed as Threatened and state listed as Endangered. Sunnyside green gentian (*Frasera gypsicola*) and Snake Range whitlow cress (*Draba oreibata* v. *serpentine)*, like Monte Neva paintbrush, are state listed as Endangered and are Candidates for federal listing. There are 10 additional federal Candidate species of concern, 12 of the 31 species are BLM-Sensitive species, and 12 of the 31 species are only at-risk species with the NNHP and have no other state or federal designation (Table 3.5-8). Sand cholla is a cactus species protected by Nevada state law, as are any other cactus species that potentially occur in the project area.

TABLE 3.5-8

Known Habitat Requirements and Status of Special Status Plant Species Evaluated for Potential Habitat in the White Pine Energy Station Project Area

Scientific Name	Common Name	Known Habitat and Flowering Period (FP)	FWS[a]	BLM[b]	State of Nevada[c]	NNHP[d]
Arenaria congesta v. *wheelerensis*	Mount Wheeler sandwort	Spruce-Aspen belt ca. 8,690 to 12,000 feet. Flowering Period (FP): July to August				T2?G5S2?
Asclepias eastwoodiana	Eastwood milkweed	Open areas on a wide variety of basic soils, including calcareous clay knolls, sand, carbonate or basaltic gravels, or shale outcrops, generally barren and lacking competition, often in moisture-accumulating microsites; shadscale, mixed-shrub, sagebrush, and lower pinyon-juniper zones. Elevation: 4,680 to 7,080 feet. FP: May to June	SOC	S		G2QS2
Astragalus diversifolius	Meadow milkvetch	Prefers alkali meadows, ditch banks, and swales in sagebrush. Edge of an alkaline seepage area with *Chrysothamnus*. Elevation: 4,400 to 6,300 feet. FP: June to July				G3S1
Astragalus lentiginosus v. *latus*	Broad-pod freckled milkvetch	Gravelly or sandy calcareous soils, generally on moderate to steep slopes, associated with the zonal vegetation. Elevation: 5,700 to 9,900 feet FP: June to August				T2G5S2
Botrychium crenulatum	Dainty moonwort	Wetland-dependent in Nevada. Elevation: 8,202 to 11,150 feet FP: July to August	SOC	S		G3S1?
Castilleja salsuginosa	Monte Neva paintbrush	Alkaline meadows in damp, saline clay soils on hummocks and drainages of travertine hot springs with greasewood, gray rabbitbrush, and *Sporobolus airoides*. Elevation: 5,965 to 6,130 feet FP: June	SOC	S	CE	G1QS1

TABLE 3.5-8

Known Habitat Requirements and Status of Special Status Plant Species Evaluated for Potential Habitat in the White Pine Energy Station Project Area

Scientific Name	Common Name	Known Habitat and Flowering Period (FP)	FWS[a]	BLM[b]	State of Nevada[c]	NNHP[d]
Cryptantha welshii	White River catseye	Dry, open, sparsely vegetated outcrops, and derived sandy to silty or clay soils, of whitish calcareous or carbonate deposits, often forming knolls or gravelly hills, and on soils adjacent to such habitats, mostly in *Juniperus - Artemisia - Chrysothamnus* vegetation. Elevation: 4,540 to 6,660 feet FP: May to June	SOC	S		G3S3
Cymopterus basalticus	Shadscale spring parsley	Bare basaltic rocks, barren clays, and (in Utah) gravelly hills and alluvial fans, mostly on dolomite. In the pinyon-juniper, sagebrush, and shadscale zones. Elevation: 5,800 to 6,900 feet FP: May to June				G2S1
Draba oreibata v. *serpentina*	Snake range whitlow cress	Gravelly or sandy calcareous soils, generally on moderate to steep slopes, associated with the zonal vegetation. Elevation: 5,700 to 9,900 feet FP: June to August	SOC		CE	T1G4S1
Draba pedicellata	Stalked whitlow cress	Carbonate crevices, scree and rocky soils, sometimes in litter under pine trees, usually on steep slopes, ridges in the pinyon-juniper, mountain mahogany, subalpine conifer, and alpine zones. Elevation: 4,800 to 10,200 feet FP: June to August				G3?S3?
Draba pennellii	Pennel draba	Crevices and ledges of carbonate or quartzite cliffs, outcrop faces, and ridges in the pinyon-juniper, subalpine, and alpine zones. Elevation: 6,200 to 11,800 feet FP: June to July				G2S2
Ericameria watsonii	Watson's goldenbush	Cliffs, rock outcrops, generally dry sites across a wide elevational range. Elevation: 4,500 to 10,400 feet FP: July to Sept.				G3G3S3
Eriogonum holmgrenii	Holmgren buckwheat	Crevices, talus, or rocky soils of limestone, quartzite, or granitic ridges and outcrops in the alpine zone. Elevation: 10,400 to 11,200 feet FP: July to August	SOC			G1S1
Frasera gypsicola	Sunnyside green gentian	Open, dry, whitish, alkaline, often salt-crusted and spongy silty-clay soils on calcareous flats and barrens, with little if any gypsum content, in cushion-plant associations surrounded by sagebrush, greasewood vegetation. Elevation: 5,180 to 5,510 feet FP: May to July	SOC	S	CE	G1S1

TABLE 3.5-8

Known Habitat Requirements and Status of Special Status Plant Species Evaluated for Potential Habitat in the White Pine Energy Station Project Area

Scientific Name	Common Name	Known Habitat and Flowering Period (FP)	FWS[a]	BLM[b]	State of Nevada[c]	NNHP[d]
Jamesia tetrapetala	Waxflower	Crevices in limestone cliffs. Elevation: 7,000 to 10,720 feet FP: June to August	SOC	S		G2S2
Lesquerella pendula	Hanging bladderpod	Gravelly carbonate (and possibly quartzite) ridge lines at high elevations. Growing on a gravel outwash fan of limestone origin. With *Juniperus.* Elevation: 10,500 feet FP: July				G2?S2?
Opuntia pulchella	Sand cholla	Sand of dunes, dry-lake borders, river bottoms, washes, valleys, and plains in the desert. Dependent on sand dunes or deep sand. Elevation: 3,950 to 6,300 feet FP: May to June			CY	G4S2S3
Penstemon concinnus	Tunnel Springs beardtongue	Gravelly alluvial soils in pinyon-juniper woodland. Elevation: 5,200 to 6,600 feet FP: May to June	SOC	S		G3S2
Penstemon leiophyllus v. *francisci-pennellii*	Pennel beardtongue	Rocky calcareous slopes, shaded banks. Occurs in dry, rocky alpine and subalpine slopes, alpine meadows, and associated with middle and upper elevation aspen stands. Elevation: more than 7,000 FP: July to August				T2G3S2
Penstemon moriahensis	Mount Moriah beardtongue	Open, gravelly, and/or silty carbonate soils in drainages, on gentle slopes, and on road banks or other recovering disturbances with enhanced runoff, in the subalpine conifer, subalpine sagebrush, mountain mahogany, and upper pinyon-juniper zones. Elevation: 7,100 to 10,800 feet FP: June to July				G1G2S1S2
Penstemon palmeri var. *micranthus*	Lahontan beardtongue	Along washes, roadsides, and canyon floors, particularly on carbonate-containing substrates, usually where subsurface moisture is available throughout most of the summer. Unknown if restricted to calcareous substrates. Elevation: 3,428 to 4,550 feet FP: May to June		S		T2?G4G5S2?
Penstemon patricus	Dad's penstemon	In cracks and crevices in granitic cliffs and rocky slopes in pinyon-juniper, mountain mahogany, and spruce associations. Elevation: 6,500 to 10,500 feet FP: July				G2QS1

TABLE 3.5-8

Known Habitat Requirements and Status of Special Status Plant Species Evaluated for Potential Habitat in the White Pine Energy Station Project Area

Scientific Name	Common Name	Known Habitat and Flowering Period (FP)	FWS[a]	BLM[b]	State of Nevada[c]	NNHP[d]
Penstemon rhizomatosus	Rhizome beardtongue	Crevices of cliffs and outcrops, or silty loam soil pockets in talus or scree, of carbonate rocks on steep slopes of various aspects in the subalpine conifer zone. Elevation: 10,000 to 11,250 feet FP: June to August				G1S1
Phacelia parishii	Parish phacelia	Moist to superficially dry, open, flat to hummocky, mostly barren, often salt-crusted silty-clay soils on valley bottom flats, lake deposits, and playa edges, often near seepage areas, sometimes on gypsum deposits, surrounded by saltbush scrub vegetation. Elevation: 2,190 to 5,922 feet FP: April to August	SOC	S		G2G3S2S3
Poa abbreviata ssp. *marshii*	Marsh bluegrass	Soil pockets in alpine scree and talus. Elevation: 11,600 feet FP: July				T2G5S1
Primula cusickiana v. *nevadensis*	Nevada primrose	Dry to moist, often sheltered carbonate cliffs, crevices, scree, and gravelly soils or soil pockets on gentle to vertical slopes, often on north to east aspects or in leeward snow-accumulation areas, sometimes in litter of bristlecone pines or in meadow or riparian areas, in the subalpine conifer and lower alpine zones. Elevation: 10,200 to 11,590 feet FP: June to August	SOC			T2G4S2
Silene nachlingerae	Nachlinger catchfly	Generally dry, exposed, or somewhat sheltered carbonate (rarely quartzite) crevices in ridgeline outcrops, talus, or very rocky soils on or at the bases of steep slopes or cliffs, on all aspects but predominantly on northwesterly to northeasterly exposures, mainly in the subalpine conifer zone. Elevation: 7,160 to 11,250 feet FP: July to August	SOC	S		G2S2
Smelowskia holmgrenii	Holmgren smelowskia	Crevices, ledges, rubble, or small soils pockets on rock outcrops and cliffs, from high-elevation ridges to north-facing walls at lower elevations, on various rock types in the lower alpine, subalpine conifer, mountain sagebrush, and upper pinyon-juniper zones. Elevation: 6,500 to 11,350 feet FP: June to July				G2G3S2S3

TABLE 3.5-8

Known Habitat Requirements and Status of Special Status Plant Species Evaluated for Potential Habitat in the White Pine Energy Station Project Area

Scientific Name	Common Name	Known Habitat and Flowering Period (FP)	FWS[a]	BLM[b]	State of Nevada[c]	NNHP[d]
Spiranthes diluvialis	Ute ladies'-tresses orchid	Moist to very wet, somewhat alkaline or calcareous native meadows near streams, springs, seeps, lake shores, or in abandoned stream meanders that still retain ample ground water, global elevation range. Elevation: 4,200 to 5,300 feet FP: July	LT	S	CE	G2SH
Trifolium eriocephalum v. *villiferum*	Woolly-head clover	Marches and alkaline meadows. Elevation: 4,000 to 7,400 feet FP: July				T2?G5S1S2
Viola lithion	Rock violet	Seasonally wet crevices in steep carbonate or quartzite outcrops in shaded northeast-facing avalanche chutes and cirque headwalls in the subalpine conifer zone. Elevation: 7,840 to 10,480 feet FP: June to July	SOC	S		G1S1

[a] FWS: LT - Listed Threatened = likely to be classified as Endangered in the foreseeable future if present trends continue; SOC - Species of Concern or Candidate for listing as Threatened or Endangered, sufficient data on vulnerability or threats on file.

[b] BLM: S - sensitive = FWS listed, proposed or Candidate for listing, or protected by Nevada state law.

[c] State of Nevada: CE = Critically endangered - species threatened with extinction, whose survival requires assistance because of overexploitation, disease, or other factors, or because their habitat is threatened with destruction, drastic modification, or severe curtailment (N.R.S. 527.260-.300); CY = Protected as a cactus, yucca, or Christmas tree (N.R.S. 527.060-.120).

[d] NNHP: G = Global rank indicator, based on worldwide distribution at the species level; T = Global trinomial rank indicator, based on worldwide distribution at the infraspecific level; S = State rank indicator, based on distribution within the state at the lowest taxonomic level; "l" = Critically imperiled due to extreme rarity, imminent threats, and/or biological factors; "2" = Imperiled due to rarity and/or other demonstrable factors; "3" = Rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction; "4" = Apparently secure, although frequently quite rare in parts of its range, especially at its periphery; "5" = Demonstrably secure, though frequently quite rare in parts of its range, especially at its periphery; H = Historical occurrence(s) only, presumed still extant and could be rediscovered; "?" = Not yet ranked at the scale indicated (G, T, or S)

Potential Habitat for Special Status Plant Species

Potential habitat for 27 of the 31 special status plant species occurs in the project area. Four species were determined to have no potential to occur because they grow at elevations well above those found in the project area or there is no potential habitat in the area. The potential habitat for special status species observed in the project area during surveys is described in Table 3.5-9.

Habitats in Steptoe Valley that have potential to support special status plant species include wet meadows, alkaline salt-crusted meadows, greasewood playa pans, and sand dunes. The dominant plant species associated with these habitats are described in Section 3.5.1, *Vegetation*. The probability of occurrence for each species was evaluated and designated as no, low, medium, or high potential. This was assessed qualitatively based on reconnaissance-level surveys conducted for special status plant species habitat in the project area and review of soil survey mapping to determine where appropriate substrate might occur (USDA, 1998). Species range maps provided online by NNHP were examined to determine the distribution within the state (NNHP web site 2005). Probability of occurrence is defined in the following text.

High Probability. Species within or very near White Pine County and the Calcareous Mountains of eastern Nevada were assumed to have a higher probability of occurring in the project area if the species' habitat was also present in the project area. A species that occurred farther away from White Pine County was assumed to have a significant range extension and thus have a lower likelihood of occurrence.

Medium Probability. A species was determined to have a medium potential to occur in the project area if its known distribution was outside White Pine County but suitable habitat was observed in the project area.

Low Probability. A species that occurred both farther away from White Pine County and had poor quality habitat in the project area was determined to have a low potential to occur in the project.

No Probability. Species for which no potential habitat was observed in the project area were considered to have no potential to occur in the project area.

The qualitative assessment of potential to occur resulted in 14 species with high potential, five species with medium potential, eight species with low potential, and four species with no potential to occur in the project area (Table 3.5-9).

TABLE 3.5-9

Potential Habitat and Potential For Occurrence of Special Status Plant Species in the White Pine Energy Station Project Area *

Scientific Name	Common Name	Potential For Occurrence	Observed Potential Habitat
Arenaria congesta v. *wheelerensis*	Mount Wheeler sandwort	No potential	The Egan Range impinges on the known lower elevation range for this species but there is no spruce-aspen habitat in the project area.
Asclepias eastwoodiana	Eastwood milkweed	Medium—range extension but habitat good	Some relatively barren areas with carbonate/andesitic/basaltic gravel and small washes and moisture accumulation areas occur throughout the Egan Range although only the southern SWIP both south and east of the corner on Bothwick Road were mapped as potential habitat because of the prevalence of barren gravel soils under pinyon-juniper woodland (Figure 3.5-1). Other potential habitat in the Egan Range in more dispersed and was not individually mapped.
Astragalus diversifolius	Meadow milkvetch	High—range and habitat good	Wet meadows and alkaline salt-crusted meadow habitat along Duck Creek drainage and tributary drainages near the Alternative 1 power plant site.
Astragalus lentiginosus v. *latus*	Broad-pod freckled milkvetch	High—range and habitat good	The Egan Range has shallow to steep slopes with limestone/dolomite (calcareous) gravel.
Botrychium crenulatum	Dainty moonwort	Low—range extension and habitat limiting	Steptoe Valley wet meadow habitats provide some potential habitat but the elevation is low and it was not determined if this species grows in alkaline soils.
Castilleja salsuginosa	Monte Neva paintbrush	High—range and habitat good	Alkaline salt-crusted meadow habitat along Duck Creek drainage and tributary drainages near the Alternative 1 power plant site. Habitats are similar to habitat at nearby known locations for this species at Monte Neva hot springs.
Cryptantha welshii	White River cats eye	High—range and habitat good	White stabilized salt-crusted sand dunes associated with Greasewood Playa occur along the Proposed Action water pipeline route in Steptoe Valley.
Cymopterus basalticus	Shadscale spring parsley	Medium—range good but good Nevada habitat not observed	The Egan Range has an array of andesitic/basaltic alluvial gravel and dolomitic gravel although basaltic rock and barren clay are not obvious in the project area. However, some appropriate substrates may still be present.
Draba pedicellata	Stalked whitlow cress	High—range and habitat good	The Egan Range has an array of limestone/dolomite (calcareous) gravelly, rocky soils, and outcrops on steep slopes.
Draba oreibata v. *serpentina*	Snake range whitlow cress	High—range and habitat good	The Egan Range has an array of limestone/dolomite (calcareous) gravelly, rocky soils and outcrops on steep slopes.

TABLE 3.5-9

Potential Habitat and Potential For Occurrence of Special Status Plant Species in the White Pine Energy Station Project Area *

Scientific Name	Common Name	Potential For Occurrence	Observed Potential Habitat
Draba pennellii	Pennel draba	High—range and habitat good	The Egan Range has shallow to steep slopes with limestone/dolomite (including some carbonate and quartzite rock) soils and rocky outcrops.
Ericameria watsonii	Watson's goldenbush	High—range and habitat good	The Egan Range both east and west of Butte Valley has gravelly dry soils that may support this species. No information was found on whether this species has affinities to specific parent material/soils. Therefore, this species can potentially occur over a greater range of conditions than most species on this list.
Eriogonum holmgrenii	Holmgren buckwheat	Low—range good but elevation too low	The Egan Range has shallow to steep slopes with limestone/dolomite (including some carbonate and quartzite rock?) rocky soils, talus and outcrops. However, the Egan Range elevations are perhaps too low for this species. There is a very low potential for this species to occur in the project area.
Frasera gypsicola	Sunnyside green gentian	High—range and habitat good	Alkaline salt-crusted meadow habitat along Duck Creek drainage and tributary drainages near the Alternative 1 power plant site.
Jamesia tetrapetala	Waxflower	High—range and habitat good	The Egan Range has numerous small limestone/dolomite outcrops that potentially can support this species.
Lesquerella pendula	Hanging bladderpod	Low—range unknown and elevations too low	The Egan Range provides gravelly carbonate rock in somewhat narrow seasonal drainages lined with juniper but these occur at elevations well below the known elevation range for this species.
Opuntia pulchella	Sand cholla	Medium—range extension and habitat is limited	White stabilized salt-crusted sand dunes associated with Greasewood Playa occur along the Proposed Action water pipeline route in Steptoe Valley. The leeward slopes of dune are often destabilized into loose sand that could support this species. Loose sand infrequently observed.
Penstemon concinnus	Tunnel Springs beardtongue	Medium—range and habitat good	The Egan Range both east and west of Butte Valley has gravelly alluvial soils supporting Pinyon-Juniper Woodland although most of these woodlands occur above 6,800 feet elevation. No information was found on whether this species has affinities to specific parent material/soils. Therefore, this species could potentially occur over a greater range of conditions than most species on this list.
Penstemon leiophyllus v. *francisci-pennellii*	Pennel beardtongue	Low—range extension and habitat limiting	The Egan Range does not have wetland habitats with the exception of the thoroughly disturbed Dry Springs. Aspen stands and subalpine habitats are not present even though rocky calcareous slopes are abundant. Low to no potential.

TABLE 3.5-9

Potential Habitat and Potential For Occurrence of Special Status Plant Species in the White Pine Energy Station Project Area *

Scientific Name	Common Name	Potential For Occurrence	Observed Potential Habitat
Penstemon moriahensis	Mount Moriah beardtongue	High—range and habitat good	The Egan Range has gravelly carbonitic substrates in seasonal drainages.
Penstemon palmeri v. *micranthus*	Lahontan beardtongue	Low—range extension and elevation too high	Steptoe Valley wet meadow and salt-crusted meadows provide suitable subsurface moisture although elevations in Steptoe Valley are roughly 1,500 feet higher than the known elevation range for this species.
Penstemon patricus	Dad's penstemon	No potential	No granitic parent material exists in the project area based on the White Pine County soil survey. No potential exists for this species to occur in the project area.
Penstemon rhizomatosus	Rhizome beardtongue	Low—range good but elevation too low	The Egan Range has shallow to steep slopes with limestone/dolomite (including some carbonate and quartzite rock) rocky soils, talus, and outcrops. However, the Egan Range elevations are perhaps too low for this species, so there likely is low potential.
Phacelia parishii	Parish phacelia	High—range and habitat good	Near Duck Creek and the Proposed Action water pipeline with low areas, including some hummocky loess areas, having a shallow water table (*Agropyron, Juncus, Distichlis*) interspersed with *Sarcobatus, Atriplex, Chrysothamnus.* Transitional between salt-crusted silty alkali meadow and Greasewood Scrub. Playa edge/ Greasewood scrub habitat is widespread but not particularly abundant along the Proposed Action water pipeline route.
Poa abbreviata ssp. marshii	Marsh bluegrass	No potential	Elevations in the project area are far too low for this species.
Primula cusickiana v. *nevadensis*	Nevada primrose	No potential	The Egan Range has limestone/dolomite substrates and outcrop habitats but elevation of the Egan Range is perhaps too low for this species.
Silene nachlingerae	Nachlinger catchfly	High—range and habitat good	The Egan Range has limestone-dolomite outcrops and talus slopes that may support this species.
Smelowskia holmgrenii	Holmgren smelowskia	Medium—range extension but habitat good	The Egan Range has outcrop habitats of limestone bedrock at appropriate elevations and associated vegetation.
Spiranthes diluvialis	Ute ladies'-tresses orchid	Low—range extension and soils probably limiting	Steptoe Valley has wet meadows and salt-crusted wetland habitats. Portions of Duck Creek have multiple side channels and a variety of moisture regimes. The wet habitats may be too saline or too alkaline for this species.

TABLE 3.5-9

Potential Habitat and Potential For Occurrence of Special Status Plant Species in the White Pine Energy Station Project Area *

Scientific Name	Common Name	Potential For Occurrence	Observed Potential Habitat
Trifolium eriocephalum v. *villiferum*	Woolly-head clover	High—good habitat, known range uncertain	Steptoe Valley has wet meadows and salt-crusted wetland habitats.
Viola lithion	Rock violet	Low—range good but habitat is limited	Egan Range has limestone outcrops but only in one location (just outside the SWIP corridor) was seasonal wetness associated with limestone outcrop.

* See text for discussion of how potential for occurrence was determined

3.6 Air Quality and Noise

3.6.1 Air Quality

This section describes the existing meteorological and air quality conditions in and around the proposed White Pine Energy Station and existing emission sources. The area around the proposed project incorporates portions of White Pine County in Nevada, approximately 30 miles north of Ely. The primary factors that determine air quality of a region are the locations of the air pollution emission sources, amounts of pollutants emitted, types of pollutants emitted, and local meteorological conditions over a period of time.

3.6.1 1 Baseline Data

The Station Proposed Action and Alternative 1 project sites are in the eastern region of Nevada. Generally, air quality in this region is good. The existing air quality does not exceed state National Ambient Air Quality Standards (NAAQS) for any of the criteria pollutants. No Class I areas exist within 100 kilometers of the proposed Station. Two Class I areas, Jarbidge Wilderness and Zion National Park, are within 300 kilometers of the proposed Station. A map of ground water basins is provided in Figure 3.6-1. The air basins and sub-basins are considered to be the same as the ground water basins for the purpose of analyzing the air resources of Nevada on a regional basis, because of similar meteorological and geographic conditions in the ground water basins. Figure 3.6-2 shows the non-attainment and Class I areas in the State of Nevada.

The EPA has established concentrations of the "criteria" air pollutants that are deemed to be protective of human health and the environment. These NAAQS are noted below.

3.6.1.1.1 Particulate Matter

The particulate matter of 10 microns or less (PM_{10}) regulation was established by the Clean Air Act for particulates less than or equal to 10 microns in diameter. Sources of PM_{10} include the following:

- Stationary point sources, such as fuel combustion and industrial processes
- Fugitive sources, such as roadway dust from paved and unpaved roads
- Wind erosion from open land
- Transportation sources, such as automobiles

PM_{10} is monitored in Ely and Elko. None of the annual averages at these locations have exceeded the annual standard. WPEA has collected 1 year of onsite ambient air quality data. The ambient air quality data show a maximum PM_{10} 24-hour average concentration of 30 micrograms per cubic meter ($\mu g/m^3$) and an annual average concentration of 10 $\mu g/m^3$.

Ambient PM_{10} was also monitored in Great Basin National Park from 1993 through 1995. During this monitoring period, the median annual concentration was 6.5 $\mu g/m^3$. In contrast, the NAAQS for PM_{10} is 150 $\mu g/m^3$ on a 24-hour average basis, not to be exceeded more than once per year on average over 3 years.

3.6.1.1.2 Ozone

Ozone is not emitted directly into the atmosphere, but rather is produced through a photo-chemical reaction involving hydrocarbons and nitrogen oxides, known as precursors. Because ozone formation results from the mixing of precursors, ozone is more of a regional concern than that associated with more localized sources of pollution such as PM_{10}. The primary sources of ozone precursors are motor vehicles.

Secondary sources include gasoline marketing and storage areas for hydrocarbons, and power plants and industrial boilers for the oxides of nitrogen.

All areas within the region around the Station project area are designated as "attainment" for the ozone NAAQS. Table 3.6-1 lists ozone values measured at Great Basin National Park, which is approximately 57 miles southeast of the Station project area.

No onsite monitoring for ozone has been conducted. The NAAQS for ozone is 80 parts per billion (ppb) on an 8-hour average, based on the 3-year average of the fourth highest daily maximum each year. The 1-hour ozone NAAQS has been rescinded.

3.6.1.1.3 Carbon Monoxide

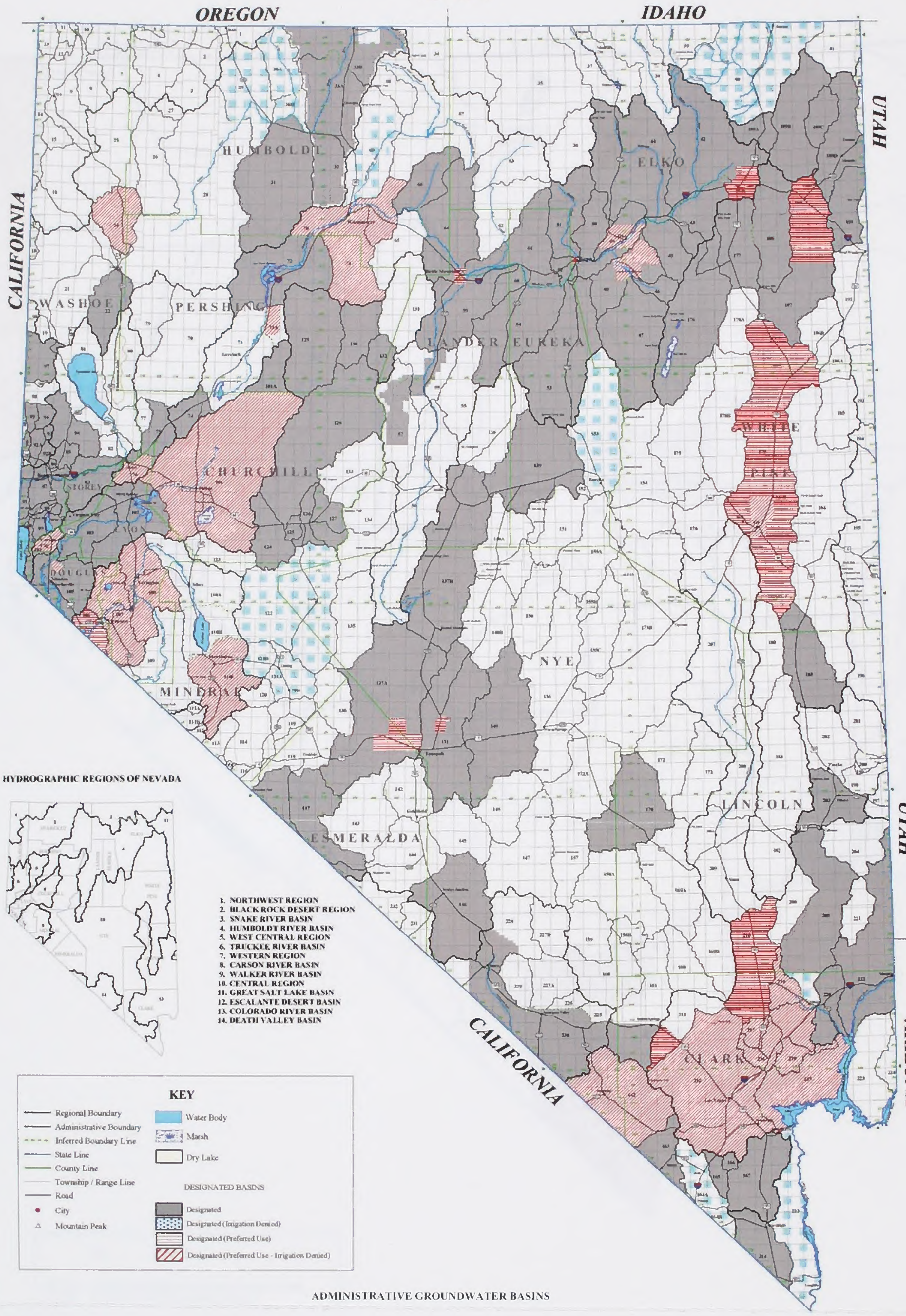
Carbon monoxide is an odorless, invisible gas usually formed as the result of incomplete combustion of organic substances. The primary source of carbon monoxide is motor vehicles. Secondary sources include aircraft emissions, and agricultural and/or forest burning. Like particulates, carbon monoxide is more of a localized pollutant because of its buoyancy and ability to disperse under normal conditions. However, during those periods when the air is stagnant, such as with a ground-based inversion, levels of carbon monoxide can increase. Levels of carbon monoxide are usually highest during the winter when inversions are more frequent.

All areas within the region around the Station project area are designated as "attainment" for the carbon monoxide NAAQS. No onsite monitoring of carbon monoxide was conducted. The NAAQS for carbon monoxide are 9 parts per million (ppm) on an 8-hour average and 35 ppm on a 1-hour average, both not to be exceeded more than once per year.

TABLE 3.6-1
Great Basin National Park CASTNet Ozone Monitoring Data

Year	1-Hour Ozone (ppb)	4th Highest 8-Hour Ozone (ppb)
2004	85	71
2003	85	78
2002	91	80
2001	81	76
2000	83	78
1999	86	76
1998	84	77
1997	84	77
1996	81	78
1995	79	71

DESIGNATED GROUNDWATER BASINS OF NEVADA

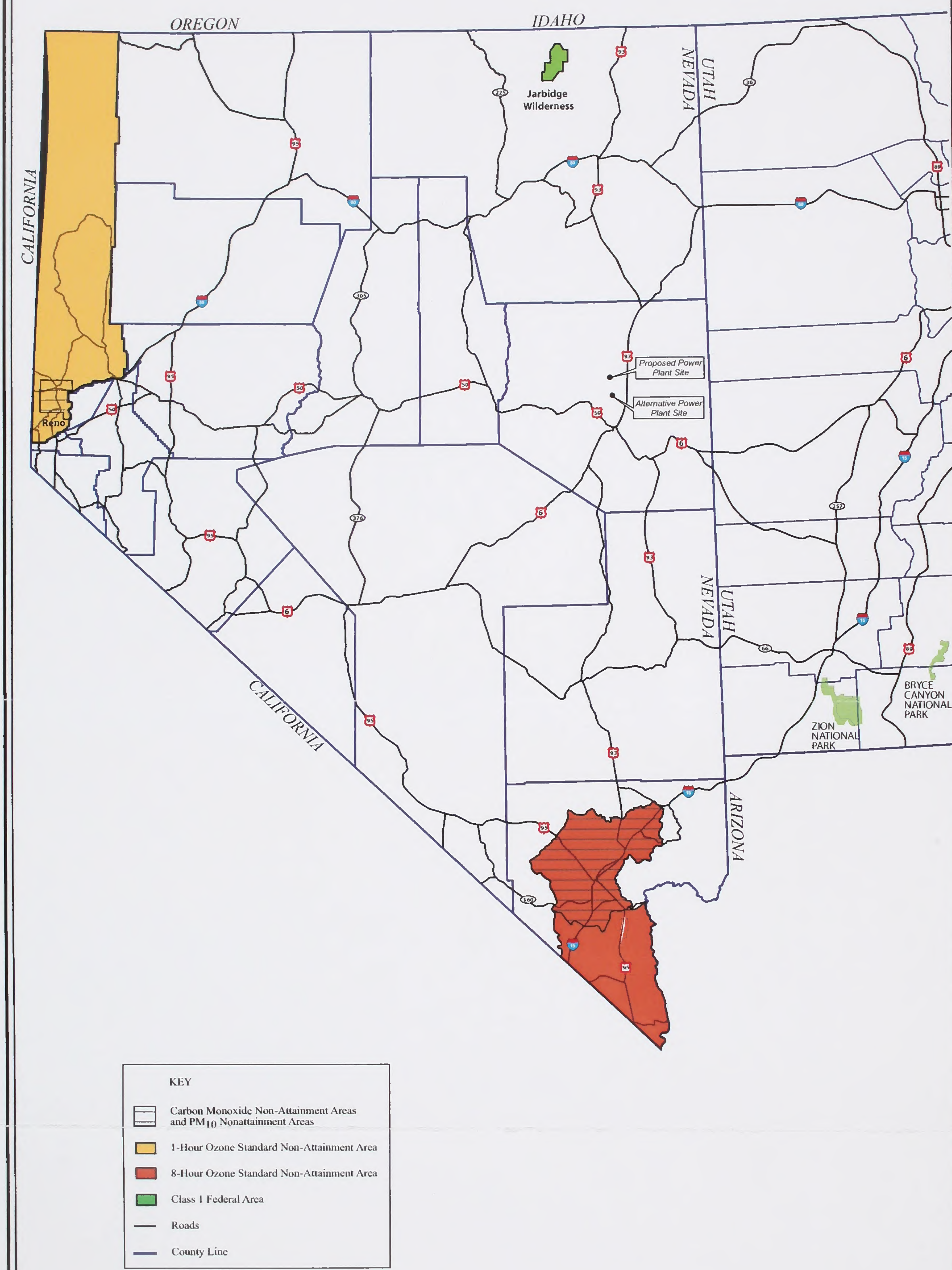


ADMINISTRATIVE GROUNDWATER BASINS

10. CENTRAL REGION
111. ALKALAI V. (MINERAL)
(A) NORTHERN PART
(B) SOUTHERN PART
112. MONO V.
113. HUNTOON V.
114. TEELS MARSH V.
115. ADOBE V.
116. QUEEN V.
117. FISH LAKE V.
118. COLUMBUS SALT MARSH V.
119. RHOOES SALT MARSH V.
120. GARFIELD FLAT
121. SODA SPRING V.
(A) EASTERN PART
(B) WESTERN PART
122. GABBS V.
123. RAWHIOE FLATS
124. FAIRVIEW V.
125. STINGAREE V.
126. COWKICK V.
127. EASTGATE VALLEY AREA
128. OIXIE V.
129. BUENA VISTA V.
130. PLEASANT V.
131. BUFFALO V.
132. JERSEY V.
133. EDWAROS CREEK V.
134. SMITH CREEK V.
135. IONE V.
136. MONTE CRISTOV
137. BIG SMOKY V.
(A) TONOPAH FLAT
(B) NORTHERN PART
138. GRASS V.
139. KOBEH V.
140. MONITOR V.
(A) NORTHERN PART
(B) SOUTHERN PART
141. RALSTON V.
142. ALKALAI SPRING V. (ESMERALDA)
143. CLAYTON V.
144. LIOA V.
145. STONEWALL V.
146. SARCOBATUS FLAT
147. GOLO FLAT
148. CACTUS FLAT
149. STONE CABIN V.
150. LITTLE FISH LAKE V.
151. ANTELOPE V. (EUREKA & NYE)
152. STEVENS BASIN
153. DIAMOND V.
154. NEWARK V.
155. LITTLE SMOKY V.
(A) NORTHERN PART
(B) CENTRAL PART
(C) SOUTHERN PART
156. HOT CREEK V.
157. KAWICH V.
158. EMIGRANT V.
(A) GROOM LAKE V.
(B) PAPOOSE LAKE V.
159. YUCCA FLAT
160. FRENCHMAN FLAT
161. INDIAN SPRINGS V.
162. PAHRUMP V.
163. MESQUITE V. (SANDY V.)
164. IVANPAH V.
(A) NORTHERN PART
(B) SOUTHERN PART
165. JEAN LAKE V.
166. HIOOEN V. (SOUTH)
167. ELOORADO V.
168. THREE LAKES V. (NORTHERN PART)
169. TIKAPOO V. (TIKABOO V.)
(A) NORTHERN PART
(B) SOUTHERN PART
170. PENOYER V. (SAND SPRING V.)
171. COAL V.
172. GARDEN V.
173. RAILROAO V.
(A) SOUTHERN PART
(B) NORTHERN PART
174. JAKES V.
175. LONG V.
176. RUBY V.
177. CLOVER V.
178. BUTTE V.
(A) NORTHERN PART (ROUND V.)
(B) SOUTHERN PART
179. STEPTOE V.
180. CAVE V.
181. DRY LAKE V.
182. DELAMAR V.
183. LAKE V.
184. SPRING V.
185. TIPPETT V.
186. ANTELOPE V. (WHITE PINE & ELKO)
(A) SOUTHERN PART
(B) NORTHERN PART
187. GOSHUTE V.
188. INDEPENDENCE V.

Air Basins and Sub-basins
White Pine Energy Station Project

Figure 3.6-1



Class I and Non-Attainment Air Quality Areas
White Pine Energy Station Project

Figure 3.6-2

ES012007004PHX/WHITE PINE ENERGY_PRABHAT/nonattainment air quality areas.ai (1/07)

3.6.1.1.4 Sulfur Dioxide

Sulfur dioxide is formed during the combustion of sulfur bearing materials, such as sulfur ores or fossil fuels. Sources that emit large quantities of sulfur contribute to ambient concentrations of sulfur dioxide. Levels of sulfur dioxide in the project area can be expected to be very low because of the lack of major sources.

WPEA has collected 1 year of onsite ambient air quality data. The ambient air quality data for sulfur dioxide show a maximum 3-hour average concentration of 42.6 $\mu g/m^3$, a 24-hour average concentration of 8 $\mu g/m^3$, and an annual average concentration of 2.7 $\mu g/m^3$. The NAAQS for sulfur dioxide are 0.03 ppm annual arithmetic mean, 0.14 ppm 24-hour average not to be exceeded more than once per year, and 0.5 ppm 3-hour average not to be exceeded more than once per year.

3.6.1.1.5 Nitrogen Dioxide

As is the case with carbon monoxide and sulfur dioxide, levels of nitrogen dioxide can be expected to be well below the NAAQS. All areas within the region around the Station project area are designated as "attainment" for the NAAQS established for nitrogen dioxide.

WPEA has collected onsite ambient air quality data for nitrogen dioxide. The ambient air quality data from the onsite monitoring show a maximum nitrogen dioxide annual average concentration of 1.9 $\mu g/m^3$. The NAAQS is 0.053 ppm annual arithmetic mean. Note that measurements of emission rates are stated as oxides of nitrogen because other oxides convert to nitrogen dioxide in the atmosphere.

3.6.1.1.6 Lead

The main sources of lead emissions are vehicles fueled with leaded gasoline and/or lead smelters. Because no lead smelters and very few vehicles using leaded fuel operate in the region, levels of lead can be expected to be well below the NAAQS.

The Nevada Division of Environmental Protection (NDEP) has not required WPEA to monitor for lead prior to submitting an air permit application because predicted concentrations from the power plant are below the significant monitoring level of 0.1 $\mu g/m^3$. NDEP monitored for lead from 1982 to 1987 at Lehman Cave (located in Great Basin National Park). Monitored values were well below 0.1 $\mu g/m^3$. Since 1987, no increase in ambient lead would be expected because of the lack of population growth in the area and the phasing out of leaded gasoline.

3.6.1.1.7 Other Baseline Data

In addition to data collected by WPEA, visibility and deposition data are also available from Great Basin National Park, approximately 57 miles southeast of the Station project area. The visibility and deposition data collected at the Great Basin National Park would be representative of existing conditions of visibility and deposition in the Steptoe Valley. The data can be obtained from the CASTNET (http://www.epa.gov/castnet/sites/grb411.html) and IMPROVE (http://vista.cira.colostate.edu/views/) websites.

Visibility monitoring data from IMPROVE are summarized in the Desert Research Institute publication "*Evaluation of Existing and Future Air Quality Monitoring at Great Basin National Park*" (2005). The visibility data collected during the 1997 to 2002 period show the overall average total light extinction coefficient (Bext) is 22.0 Mm-1. During that time the visual range was approximately 177 kilometers or approximately 7.9 deciviews. The average

PM2.5 mass concentration was 2.8 mg/m^3. The average contributions of the major aerosol components to Great Basin National Park haze are particulate sulfate 14.2 percent, nitrate 3.8 percent, organic matter 18.0 percent, light absorbing carbon 6.5 percent, fine soil 2.9 percent, and coarse mass 9.2 percent.

3.6.1.1.8 Jarbidge Wilderness Area and Zion National Park Baseline Data

As part of the Interagency Monitoring of Protected Visual Environments (IMPROVE) network, visual air quality in Zion National Park and Jarbidge Wilderness Area has been monitored using aerosol samplers. The visibility data can be obtained from the website http://vista.cira.colostate.edu/views/.

3.6.1.1.9 VOC, Mercury, and Hazardous Air Pollutant Monitoring Data

No volatile organic compounds (VOCs), mercury, or hazardous air pollutants (HAPs) ambient air monitoring data are available in the vicinity of the proposed Station site. Background air concentrations for these compounds are assumed to be negligible based on the geographic disbursement of other emission sources in the region.

3.6.1.1.10 Greenhouse Gases

Information from various sources indicates an increase in the atmospheric concentration of greenhouse gases over the past century. Local concentrations of carbon dioxide and other greenhouse gases are irrelevant in this context, as the issue pertains to global buildup of these gases. The Intergovernmental Panel on Climate Change (IPCC), in the document "Climate Change 2007: The Physical Science Basis, Summary for Policymakers", indicates that global average carbon dioxide has increased from approximately 280 ppm in pre-industrial times to 379 ppm in 2005, and that this recent value exceeds the natural range of 180 to 300 ppm observed over the past 650,000 years. The human-caused component of this increase is demonstrated to be caused primarily by fossil fuel use. Atmospheric concentrations of methane and nitrous oxide have also increased, due primarily to agricultural impacts.

3.6.1.2 Meteorological Conditions

In accordance with the approved Nevada Bureau of Air Pollution Control protocol, WPEA collected 1 year of site-specific meteorological surface data near the Station Proposed Action site for use in the air quality impact analysis. The onsite data collection begin January 6, 2005, and ended January 5, 2006. WPEA's year of site-specific meteorological data has been reviewed and approved by the NDEP.

The AERMOD Meteorological Preprocessor (AERMET, version 04300) was used to generate AERMOD compatible hourly surface and profile meteorological files. Data were processed with the upper air data from the National Weather Services station located in Elko, Nevada (WBAN 04105), and the surface data from the National Weather Services station located at the Ely Regional Airport (Yelland Field) (WBAN 23154).

The Station site has an arid to semi-arid continental climate with mild winters and mild summers (Table 3.6-2). The regional topography of the area tends to channel winds in a south-to-north direction. The mountains to the east and southwest also tend to affect the regional climate. The average annual temperature in the area is approximately 46°F. The average maximum temperature in July is approximately 87°F with maximum readings occasionally over 100°F. The average minimum temperature in January is approximately 9°F with minimum readings generally below 30°F. Average annual precipitation is approximately 10 inches (Table 3.6-2).

TABLE 3.6-2

Average Minimum and Maximum Temperature and Precipitation

	Temperature (°F)		Precipitation (inches)	
	Ely	**Elko**	**Ely**	**Elko**
Monthly Mean				
January	9 to 40	13 to 37	0.70	0.98
February	15 to 44	20 to 43	0.65	0.80
March	20 to 48	25 to 50	0.96	0.96
April	26 to 57	30 to 59	1.00	0.82
May	34 to 67	37 to 69	1.15	1.00
June	41 to 79	45 to 80	0.88	0.91
July	48 to 87	50 to 91	0.69	0.33
August	47 to 84	49 to 89	0.83	0.65
September	37 to 75	39 to 78	1.01	0.62
October	28 to 64	30 to 66	0.89	0.65
November	19 to 49	23 to 49	0.67	1.11
December	11 to 41	14 to 37	0.7	1.10
Annual Mean				
	28.0 to 61.2	31.1 to 62.4	10.13	9.93

Source: Based on 1961-1990 record period from website www.climate-zone.com.

Surface winds in the region are characterized by prevailing south-north winds with an average annual speed of approximately 2.2 to 2.5 miles per hour. Wind speeds are lowest in the third quarter of the year with an average of approximately 1.8 miles per hour. October to December is typically the windiest season with an average wind speed of approximately 2.7 miles per hour. Figure 3.6-3 shows a wind rose for the Station project area based on collected onsite data. The wind rose graphically depicts a plot of 1 year of hourly wind speed and vector recordings collected at a 10-meter height.

3.6.1.3 Existing Emission Sources

The nearby source inventory was created from data provided by NDEP and the Utah Department of Environmental Quality. Both agencies were contacted and asked to download from their emissions inventory databases the complete list of PM_{10}, oxides of nitrogen, and sulfur dioxide sources within 138 kilometers of the Station Proposed Action power plant site. NDEP provided 223 records of information for both major sources (sources subject to PSD permitting) and minor sources (sources not subject to PSD permitting). Utah Department of Environmental Quality provided 11 records of information. Note that multiple records are provided for various facilities, as some facilities include multiple emission sources. NDEP's inventory included sources up to 155 kilometers from the Proposed Action power plant site, and Utah Department of Environmental Quality's inventory included a source 138 kilometers from the proposed site. Records from the source inventories with identical coordinates and stack characteristics were grouped together to provide 28 unique sources (and

15 unique facilities) for modeling. The 15 facilities are listed in Table 3.6-3 and shown in Figure 3.6-4.

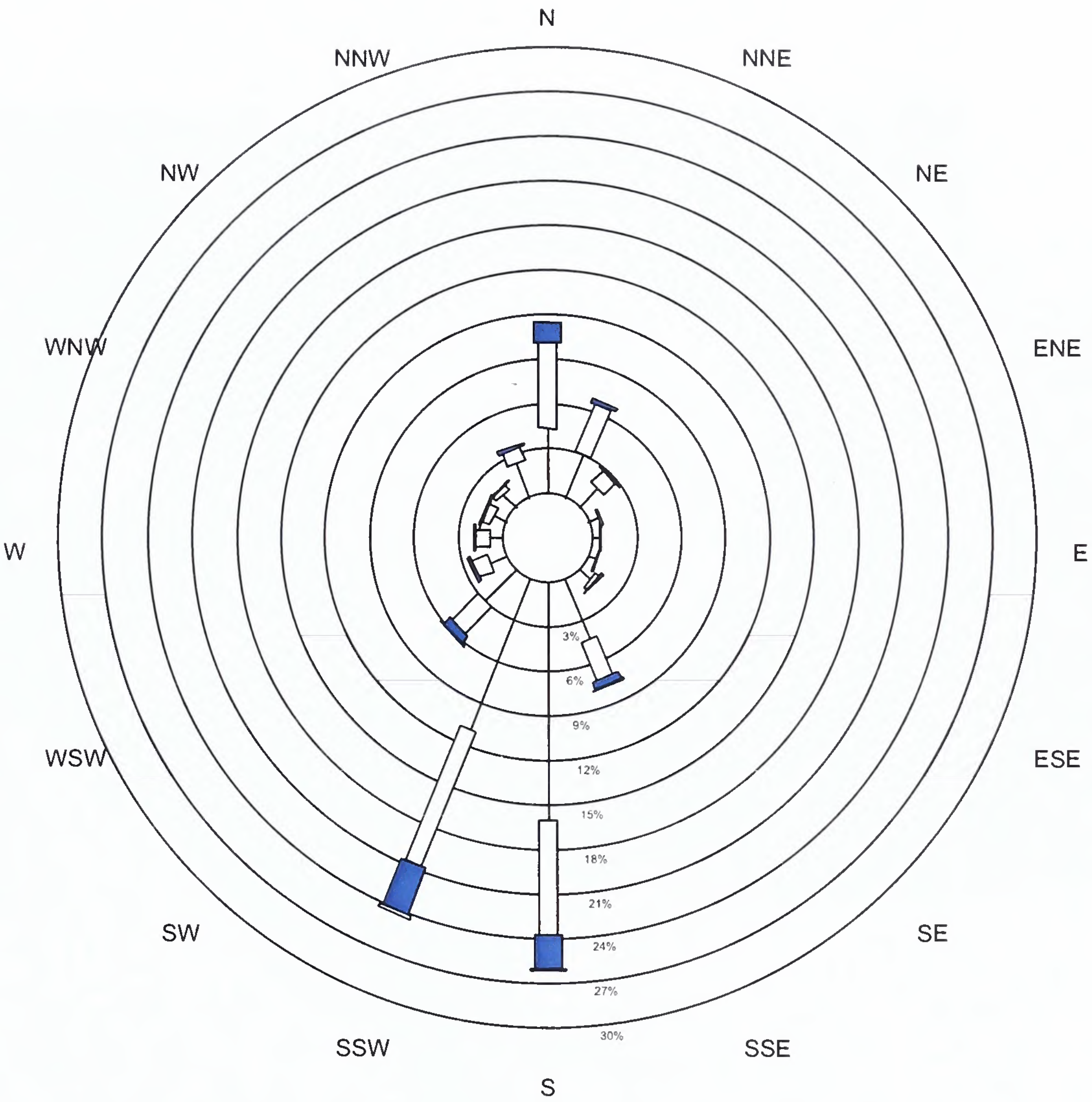
The noted stationary sources were segregated into increment consuming (those sources which would cause deterioration of air quality after certain federally-designated trigger dates) and non-increment consuming sources in conjunction with NDEP review.

Increment consumption from area and mobile source emissions was assumed to be negligible because of the decrease in population in White Pine County since the PM_{10} and sulfur dioxide minor source baseline dates. The concept of increment consumption is explained more fully in Section 4.6, *Air Quality and Noise*.

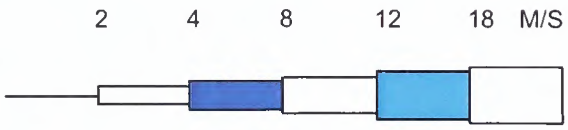
TABLE 3.6-3

Source Inventory for Increment and NAAQS Modeling

			Oxides of Nitrogen	PM_{10}		Sulfur Dioxide	
ID	**State**	**Facility**	**(tons per year)**	**(pounds per hour)**	**(tons per year)**	**(pounds per hour)**	**(tons per year)**
373	Nevada	Robinson Nevada Mining Company	28.31	104.43	107.37	5.47	4.24
405	Nevada	Newmont Gold Company	--	7.96	23.4	--	--
543	Nevada	J&M Trucking - Ely	--	0.83	0.66	--	--
713	Nevada	Homestake Mining Company	--	0.01	0.06	--	--
835	Nevada	Reck Brothers	10.28	3.57	3.57	0.92	0.93
1065	Nevada	Nevada Slag	10.69	6.91	3.84	7.42	6.97
1124	Nevada	Reed Distributing	--	0.002	0.01	--	--
1177	Nevada	J&M Trucking - Eureka	--	0.57	0.92	--	--
1336	Nevada	Bald Mountain Mine - Mooney	--	0.20	0.83	--	--
1362	Nevada	Bald Mountain Mine - Huntington	2.56	0.35	1.49	0.0006	0.003
1377	Nevada	Cooper & Sons	14.11	5.85	4.61	4.95	4.45
1417	Nevada	Country Construction	--	3.30	1.2	--	--
1466	Nevada	White Pine County Schools	1.44	2.1	3.27	0.11	0.16
1594	Nevada	Chevron Environmental Mgt Co.	1.83				
10706	Utah	U.S. Army - Dugway Proving Ground	--	--	--	5.24	22.94
		Total	**68.2**	**136**	**151**	**24.1**	**39.7**

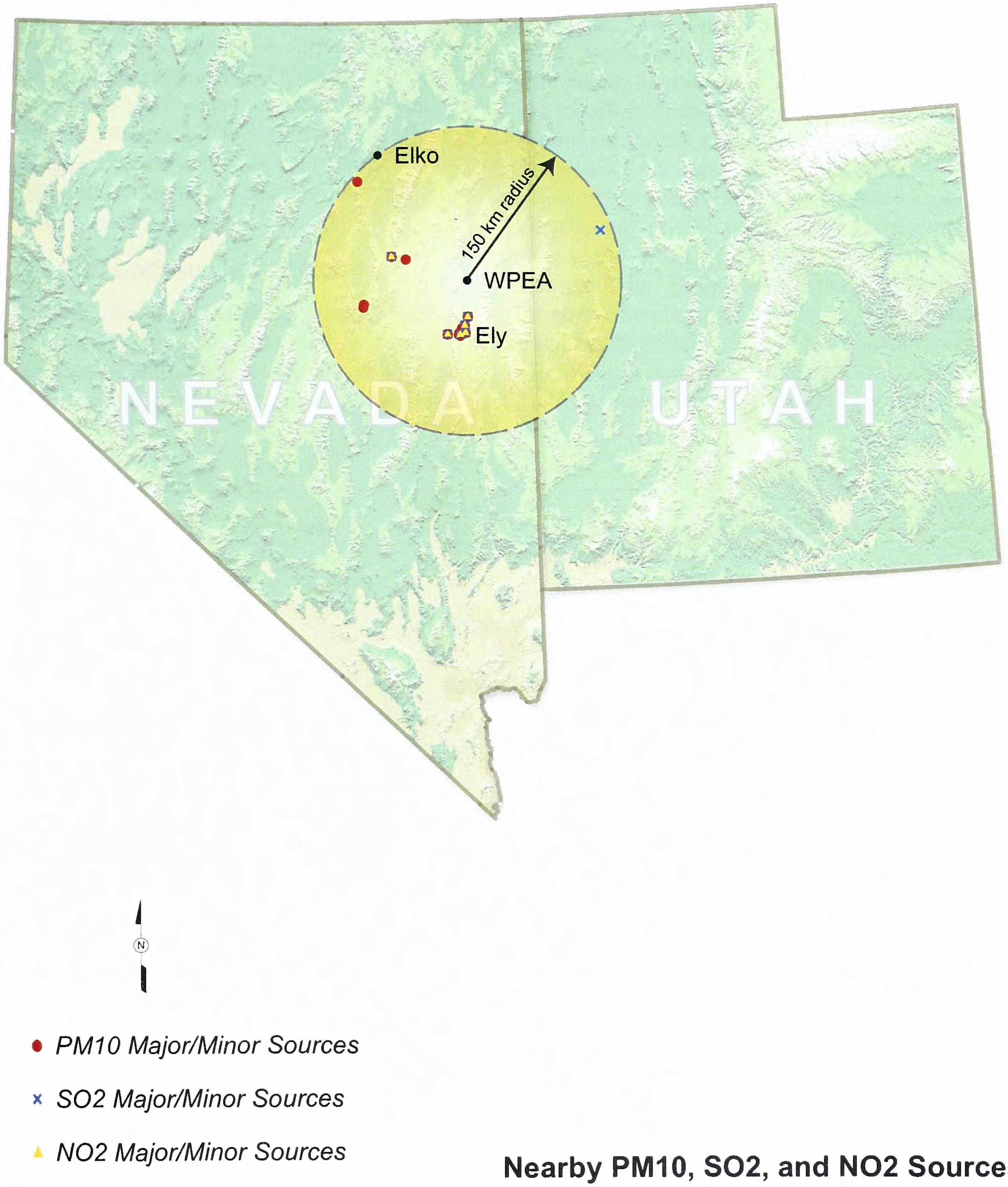


LS Power 10-meter Wind Frequency Distribution
2005 Data
Calm hours = 359 Missing hours =2
Number of non-calm/missing hours = 8399



Wind Rose
White Pine Energy Station Project

Figure 3.6-3



Nearby PM10, SO2, and NO2 Sources
White Pine Energy Station Project

AIR SCIENCES INC.
GOLDEN, COLORADO

Figure 3.6-4

3.6.2 Noise

This section addresses existing noise sources and levels at noise-sensitive locations in the vicinity of the White Pine Energy Station Proposed Action and Alternative 1 power plant and substation sites. Noise levels near the power plant and associated substation sites are dominated by traffic on U.S. 93, while current noise exposure near the proposed Thirtymile Substation site is dominated by traffic on U.S. 50.

3.6.2.1 Fundamentals of Noise

Unless otherwise stated, all sound levels reported in this section are in A-weighted decibels (dBA). A-weighted sound level is defined as the level, in decibels, measured with a sound level meter having the metering characteristics and a frequency weighting specified in the American National Standards Institute Specification for Sound Level meters, ANSI S 1.4–1983. The A-weighting de-emphasizes lower frequency sounds (below 1,000 Hertz [1 kiloHertz]) and higher frequency sounds (above 4 Hertz). It emphasizes sounds between 1 kiloHertz and 4 kiloHertz. A-weighting is the measure most used for traffic and environmental noise throughout the world. Most community noise standards utilize A-weighting, as it provides a high degree of correlation with human annoyance and health effects. Table 3.6-4 shows typical indoor and outdoor noise levels associated with common sources or activities.

TABLE 3.6-4

Typical Noise Levels (dBA)

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet fly-over at 1,000 feet		
	100	
Gas lawn mower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban daytime	50	Dishwasher next room
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans Technical Noise Supplement (TeNS), 1998

The actual impact of noise is not a function of loudness alone. The time of day during which noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been used such as L_{10}, L_{50}, and L_{dn}. The noise descriptor used for this study is the L_{eq}.

The L_{eq} is the equivalent steady state sound level which in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same period. The L_{eq} (1 hour) is the energy-average of the A-weighted sound levels occurring during a 1-hour period, in decibels (that is, a one hour L_{eq}). From the source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on the following important factors:

- Geometric spreading from point and line sources
- Ground absorption
- Atmospheric effects and refraction
- Shielding by natural and man-made features, noise barriers, diffraction, and reflection

Sound from a small localized source (approximating a "point" source) radiates uniformly outwards in a spherical pattern as it travels away from the source. The sound level decreases at a rate of 6 dBA for each doubling of the distance (6 dBA/DD).However, highway traffic and train noise are not single, stationary point sources of sound. The movement of the vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval.

Changes in noise levels are perceived as follows:

- A 3 dBA change is barely perceptible
- A 5 dBA change is readily perceptible
- A 10 dBA change is perceived as a doubling or halving of noise

3.6.2.2 Station Feature Sites

3.6.2.2.1 Proposed Action Power Plant Site

Prominent landmarks near the Proposed Action power plant site include U.S. 93 and the Schell Creek Range (in the Humboldt-Toiyabe National Forest) to the east; Duck Creek and the Egan Range to the west; and Goshute Lake to the north. The communities of McGill and Ely are approximately 22 miles and 34 miles south of the Proposed Action power plant site, respectively, and Great Basin National Park is approximately 57 miles to the southeast. The Proposed Action power plant site is located in a sparsely populated area. The closest noise sensitive receptor, Hot Springs Ranch, is approximately 3 miles from the power plant site.

3.6.2.2.2 Alternative 1 Power Plant Site

Prominent landmarks near the Alternative 1 power plant site area are the same as described for the Proposed Action. The communities of McGill and Ely are approximately 10 and 22 miles south of the Alternative 1 power plant site. The Alternative 1 power plant site is located farther from the nearest noise sensitive receptors (Hot Springs Ranch) than the Proposed Action power plant site.

3.6.2.2.3 Duck Creek Substation Site(s)

A new 500-kV electric substation would be located adjacent to and interconnected with the Proposed Action or Alternative 1 power plant.

3.6.2.2.4 Thirtymile Substation Site

A new 500 kV/345 kV electric substation would be located approximately 18 miles northwest of Ely in the Robinson Summit area. This substation site is 0.6 mile from U.S. 50.

3.6.2.3 Background Noise Levels

Except for traffic on U.S. 93 and U.S. 50, there is no other noise source close to the Station power plant sites and substation sites. Ambient noise at these sites is dominated by traffic noise. The annual average daily traffic data and the percentages of automobiles, medium trucks, and heavy trucks for rural areas were obtained from the Nevada Department of Transportation Annual Traffic Report (NDOT, 2004). Based on these data, background noise levels at sensitive locations are estimated to be 45-50 dBA at the Proposed Action and Alternative 1 power plant sites (and the Duck Creek Substation site[s]), and 40-45 dBA at the proposed Thirtymile Substation site. The calculation methodology follows the basic principles of the Traffic Noise Model developed by the U.S. Federal Highway Administration.

3.6.2.4 Noise Regulations or Standards

All sensitive noise receptors of concern in the project area are located in White Pine County. White Pine County does not have noise regulations or standards applicable to the Station.

3.7 Visual Resources

This section describes visual resources in the project area and how the BLM's Visual Resource Management (VRM) System was used to describe existing conditions and to assess potential impacts in Chapter 4. The section discusses the Key Observation Points (KOPs) that were used to describe existing conditions and to subsequently assess potential impacts of the Proposed Action and Alternative 1 on visual resources.

3.7.1 Analysis Area

The visual resources analysis area for the proposed White Pine Energy Station consists of the "seen areas" (or viewsheds) of several proposed project facilities. These facilities are the cooling towers, the steam generator stacks, the power plant (building), and transmission line tower structures. Seen areas were determined by conducting a geographic information system (GIS) terrain analysis to depict the extent of the potential line of sight distance of the facilities in the landscape. The analysis area for visual resources primarily includes Steptoe Valley, slopes of the adjacent Schell Creek Range to the east, the Egan and Cherry Creek Ranges to the west, Hunter Flat, Butte Valley, and the Robinson Summit area.

3.7.2 Existing Conditions

All proposed project facilities except part of the transmission line would be located in Steptoe Valley. This north-south oriented valley lies between fault block mountain ranges, the Egan and Cherry Creek Ranges to the west, and the Schell Creek Range to the east. The valley is characterized by nearly flat to gently sloping basins, terraces, floodplains, and fan skirts. Duck Creek and several bodies of water (for example, Goshute Lake to the north and the McGill Tailings Reclamation Area to the south) are found in the valley. Vegetation in the valley consists of plants typically found in the Great Basin sagebrush community and includes several species of sagebrush, rabbitbrush, and an understory mixture of grass species. Local stands of Rocky Mountain juniper are found along the higher edges of the valley. In the mountains, vegetation communities range from the Great Basin sagebrush at the lower elevations to pinyon-juniper woodlands at the middle to higher elevations.

Steptoe Valley and the adjacent mountains have a largely undeveloped appearance. The south end of the valley has the most development and human-made features in the analysis area. It contains the City of Ely, the Falcon to Gonder transmission line, the Gonder Substation, U.S. 50, the community of McGill, the McGill Tailings Reclamation Area, the pipeline on the east side of the valley that supplied water to the closed Kennecott facility, residences, and other areas of development. The central part of the valley is largely undeveloped, but does contain scattered ranches and residences. The north end of the valley also contains scattered residences, commercial businesses at Schellbourne, and the community of Cherry Creek. Several linear human-made features can be seen throughout the valley including U.S. 93, County Road 27, several side roads, the NNR, and various transmission lines that generally parallel U.S. 93 and other roads. Cattle grazing occurs throughout the valley and mountains.

Development near the communities of Ely and McGill has created an "island" or "dome" of light in an area of central Nevada that is one of the darkest areas in the continental United States, as evidenced by satellite imagery maps produced by the

Light Pollution Science and Technology Institute (NPS, 2006). The issue of light associated with human development having impacts on "dark skies" is receiving more and more attention nationally. Lights from Ely can be seen from Great Basin National Park, and the NPS is concerned about the potential of increased impacts from White Pine Energy Station light on dark skies at National Parks (Moore, 2005).

3.7.3 BLM Visual Resource Management System

The BLM's VRM system provides a way to inventory and evaluate the scenic value of an area's visual resources in order to determine appropriate levels of management (BLM, 1986a; BLM, 1986b). The system also provides a way to analyze potential visual impacts and apply visual design techniques to ensure that surface-disturbing activities are harmonized with their surroundings or are appropriate with the surrounding landscape.

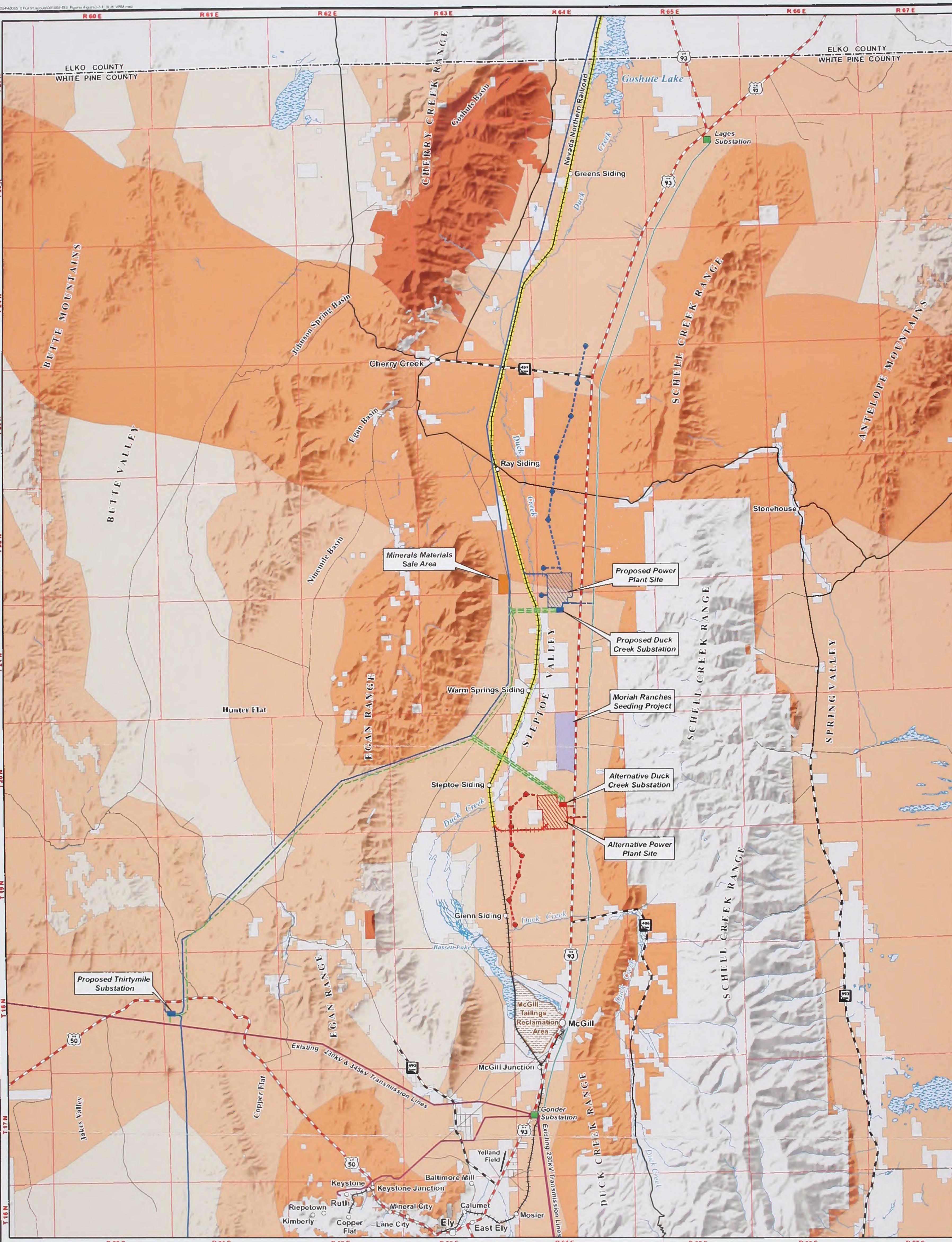
The VRM system consists of two stages: the inventory stage and the analysis stage. The inventory stage involves identifying and inventorying the visual resources of an area. Inventory classes are assigned using BLM's visual resource inventory process. The analysis stage involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from representative or selected key travel routes and/or observation points. Results of the visual resource inventory were considered (along with many other resources) when the Draft Ely Resource Management Plan (BLM, 2005a) was developed. A Resource Management Plan establishes how the public lands will be used and allocated for different purposes. Visual values are considered in the development of the Draft Resource Management Plan, and the area's visual resources are assigned one of four VRM Classes (classes). Table 3.7-1 lists the management objectives of the VRM classes.

TABLE 3.7-1

VRM Classes and Management Objectives

VRM Class	Management Objective
I	To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
II	To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
III	To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
IV	To provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

The Draft Ely Resource Management Plan (BLM, 2005a) assigned preliminary VRM classes to all BLM lands in the District. Figure 3.7-1 depicts the preliminary VRM classes that were assigned to lands in the analysis area. Much of Steptoe Valley and other nearby areas were assigned VRM Class 3. Areas of VRM Class 2 were assigned to areas approximately 5 miles on either side of the Pony Express Route, along the Egan Range between Dry Canyon and Antone Pass, and along the lower slopes of the Duck Creek Range (below Forest Service lands). Several large areas of VRM Class 4 were assigned to BLM lands, including areas west of Duck Creek and Bassett Lake and in Butte Valley. The Goshute Wilderness, located along the southern part of the Cherry Creek Range, was assigned VRM Class 1.



Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

BLM VRM Classes
- Class 1
- Class 2
- Class 3
- Class 4

0 1.5 3 Miles

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BLM Visual Resource Management (VRM) Classes
White Pine Energy Station Project

Figure 3.7-1

The VRM system also subdivides landscapes into three distance zones based on relative visibility from travel routes or observation points. The three zones are foreground-middleground, background, and seldom seen. The foreground-middleground zone includes areas seen from highways, rivers, or other viewing locations that are less than 3 to 5 miles away. The background zone is generally considered to include areas seen beyond the foreground-middleground zone that are usually less than 15 miles away. Areas not seen as foreground-middleground or background (hidden from view) are in the seldom-seen zone. For this DEIS, the three distance zones are used to describe the distance of objects from KOPs.

3.7.4 Key Observation Points

Projects such as the proposed White Pine Energy Station are potentially seen from a large area. In such large areas it is impractical to describe the existing visual conditions and potential project impacts from all important viewing areas. To assist in the description of the existing visual environment and to help in assessing potential project impacts, representative viewing areas called KOPs are selected. KOPs are selected to represent views of a potential project from different geographic areas (close-up and distant views of a potential project); from different types of viewing areas (roadways, residences, recreation areas, etc.); and by different types of viewers (residents, people driving through an area, etc).

For this DEIS, six KOPs were selected from throughout the analysis area (see Figure 3.7-2). The KOPs represent different locations in the analysis area, different types of viewers, and different distances from facilities of the proposed alternatives. The KOPs (from north to south) are as follows:

- KOP 1—Cherry Creek
- KOP 2—Pony Express Route
- KOP 3—Lincoln Highway
- KOP 4—U.S. 93 Turnoff
- KOP 5—McGill
- KOP 6—U.S. 50

The following describes each KOP and the existing visual condition of the landscape seen from each KOP. Appendix E, *Visual Inventory Forms,* contains Visual Resource Inventory Forms that were prepared based on field examinations of the visual settings of each KOP. The forms include descriptions of the characteristic landscape, types of viewers, sensitivity of viewers, and other relevant information.

3.7.4.1 KOP 1: Cherry Creek

The community of Cherry Creek was selected to represent one of the few populated areas in the analysis area. It was also chosen to represent views from the northern and western parts of Steptoe Valley. KOP 1 offers expansive views of the valley floor and the Proposed Action power plant site approximately 12 miles to the southwest. Photo 3.7-1 depicts the view of the valley from KOP 1. This KOP represents the types of views that people have of the valley while driving into or out of the community of Cherry Creek. It is also similar to the views that some residences of Cherry Creek would have of the Proposed Action power plant site.

Other than County Road 27 and some distant scattered buildings and fences, few human-made objects are visible from this KOP when looking in the direction the photograph was taken. The view directly behind the direction of this KOP is quite different and includes the Cherry Creek Cemetery along with several residential buildings.

Most of the area that can be seen from this KOP is BLM land that is either VRM Class II or III.

3.7.4.2 KOP 2: Pony Express Route

KOP 2 is located in the central part of Steptoe Valley on County Road 18, which also is the route of the Pony Express National Historic Trail. This KOP is located where the proposed water pipeline would cross under the road and is approximately 4.5 miles north of the Proposed Action power plant site. Views to the south of this KOP would include the proposed water pipeline ROW and the Proposed Action power plant site. Views from this KOP are expansive and range from east to west across the width of the valley (see Photo 3.7-2). The primary viewers from this location are people driving on County Road 18 (to access the community of Cherry Creek or for other purposes). Scattered buildings (particularly at Schellbourne approximately 1.5 miles east of KOP 2 and the community of Cherry Creek approximately 10 miles northwest) can be seen in the distance from this location, but the overall appearance of the landscape is natural and signs of human-made objects are few.

Because of the significance of the Pony Express National Historic Trail, a swath of BLM land following much of the Trail's route has been assigned VRM Class II. The segment of Class II land adjacent to KOP 2 extends north and south approximately 5 miles. Beyond the Class II lands are BLM lands that have been assigned VRM Class III.

3.7.4.3 KOP 3: Lincoln Highway

KOP 3 was selected for several reasons. It represents views looking north from the historic Lincoln Highway towards the Proposed Action power plant site (see Photo 3.7-3). Views from this location are similar to views of the valley (and the Proposed Action power plant site) that people driving north on U.S. 93 would have. KOP 3 also represents views from a nearby ranch. In addition, it is similar in distance (3 miles away) from the Proposed Action power plant site as several residences located in the Mattier Creek area (although they are located at a higher elevation than KOP 3).

Human-made features visible from this location are limited to the Lincoln Highway and U.S. 93 (approximately 1 mile to the west), a transmission line with wood poles that parallels U.S. 93, fences, and ranch buildings (behind the direction from which the photograph was taken).

BLM lands in the foreground-middleground have been assigned VRM Class III (see Photo 3.7-3). The VRM class changes to Class II approximately 3 miles north of the KOP.

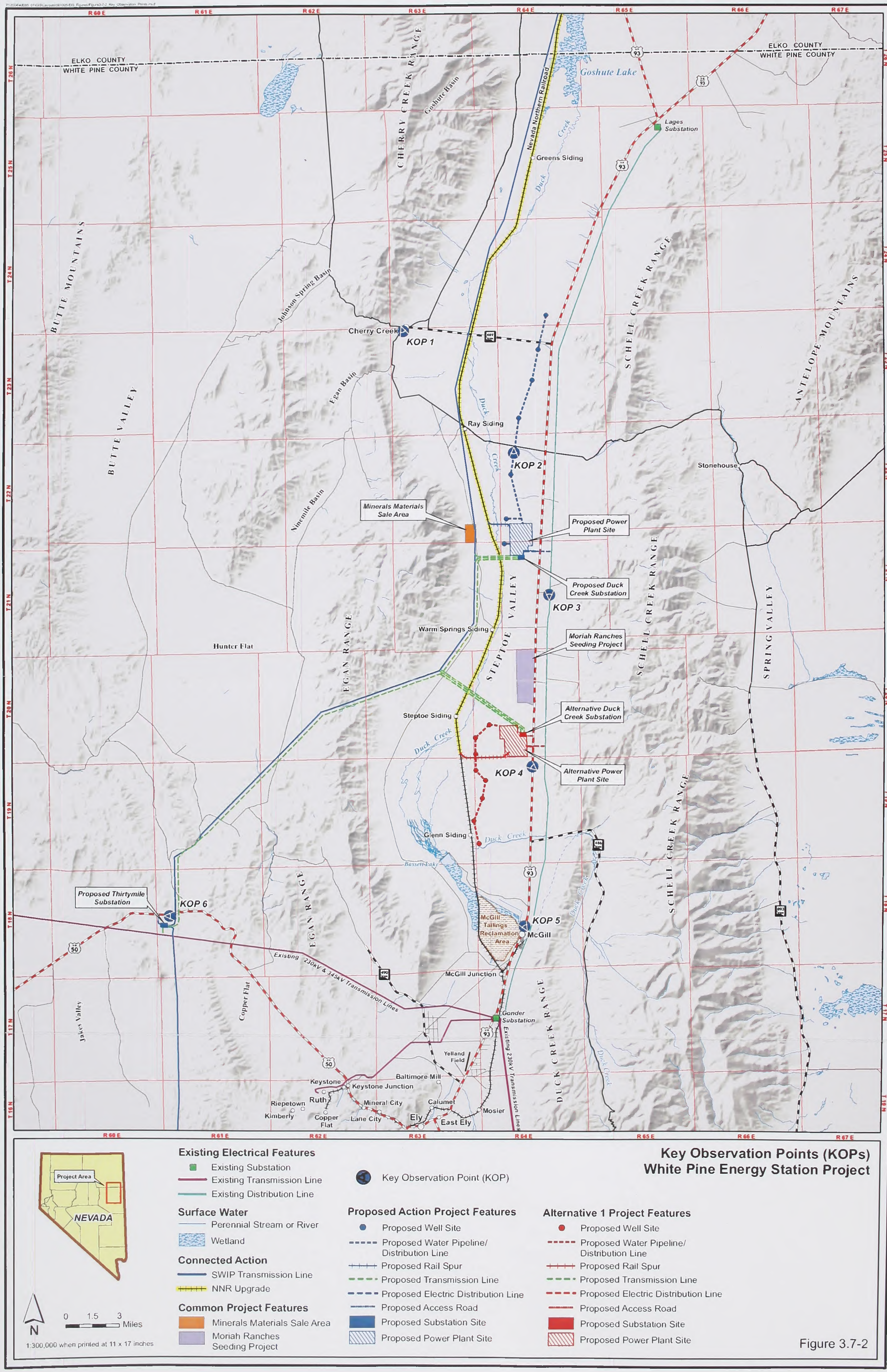
3.7.4.4 KOP 4: U.S. 93 Turnoff

KOP 4 is located at an existing turnoff along U.S. 93 that is within approximately 0.25 to 0.5 mile of the Alternative 1 power plant site (see Photo 3.7-4). It represents close views that people driving north on U.S. 93 would have of Alternative 1 power plant facilities. KOP 4 is situated in one of the widest (10 miles) parts of Steptoe Valley. U.S. 93, some unpaved roads, and fencing are the only human-made features visible from this KOP.

This KOP is located in an area where BLM lands have been assigned VRM Class III. The nearest BLM land in the direction the photograph was taken that is classified as other than Class III is an area of Class II lands (on part of the Egan Range) approximately 8 miles to the northwest.

PHOTO 3.7-3
View from KOP 3

PHOTO 3.7-4
View from KOP 4



Key Observation Points (KOPs)
White Pine Energy Station Project

Figure 3.7-2

3.7.4.5 KOP 5: McGill

KOP 5 is located at the north end of the community of McGill approximately 30 feet west of U.S. 93. This KOP was selected to represent views of the southern part of Steptoe Valley and the analysis area that residents in the vicinity of McGill have (see Photo 3.7-5). It also represents the views people driving north on U.S. 93 have of Steptoe Valley. Because this KOP is in a developed area, many human-made features are visible. These features include residences, light poles, and utility lines to the east and the McGill Tailings Reclamation Area and scattered residential buildings to the west and north.

Lands adjacent to this KOP are private, but BLM lands can be seen in the middleground and background (see Photo 3.7-5). Most of the BLM lands visible from this location are VRM Class III.

3.7.4.6 KOP 6: U.S. 50

KOP 6 is located on the side of U.S. 50 within approximately 0.25 mile of the proposed entrance/access road to the proposed Thirtymile Substation. This section of highway represents one of the closest locations that motorists driving on U.S. 50 would have of viewing the entrance to the substation and the proposed transmission line that would pass over the highway to the substation (see Photo 3.7-6). Other than the highway, highway signs, and barbed wire fencing that parallels the highway, the adjacent hillsides visible from this location have a natural appearance and do not contain human-made objects.

All of the lands visible from this location (except the highway ROW) are BLM VRM Class III lands.

PHOTO 3.7-5
View from KOP 5

PHOTO 3.7-6
View from KOP 6

3.8 Recreation Resources

This section describes recreational opportunities in the project area and discusses relevant recreation plans and policies. Federal, state, county, and private recreational opportunities within 50 miles of the project area are shown in Figure 3.8-1.

3.8.1 Analysis Area and Methodology

The analysis area for recreation resources includes all federal, state, local, and private recreation areas within 50 miles of the project route alternatives. This includes recreational opportunities on federal lands managed by the BLM and Forest Service, including WSAs. This analysis included a review of available existing recreation information in the analysis area, including information from the BLM Ely District Office, White Pine County, and the State of Nevada.

3.8.2 Recreational Opportunities on Federal Lands

3.8.2.1 Bureau of Land Management

The BLM provides a wide variety of dispersed outdoor recreational opportunities on more than 5 million acres of land in the analysis area. Recreational opportunities include fishing, hunting, camping, picnicking, hiking, spelunking, and wildlife viewing. Other activities include photography, nature study, rock climbing, mountain biking, horseback riding, cross-country skiing, off-highway vehicle riding, and scenic driving. The BLM also offers a number of developed recreation sites in the analysis area. Table 3.8-1 identifies the developed recreation areas managed by the BLM Ely District Office within 50 miles of the project route alternatives.

3.8.2.1.1 Garnet Hill Recreation Area

The Garnet Hill Recreation Area is located at the 7,000-foot Garnet Hill elevation, approximately 9.5 miles north of Ely via U.S. 50. This recreation area provides picnicking opportunities as well as rock collecting activities at the Garnet Fields Rockhounding Area (Recreation, 2005).

3.8.2.1.2 Cleve Creek Campground

Fishing, hiking, mountain biking, and cross-country skiing are available at the Cleve Creek Campground. Camping and a group barbecue area also are available at the Cleve Creek Campground (Recreation, 2005). The campground is approximately 26 miles southeast of Ely on U.S. 6/50, then north on SR 893 for 12 miles.

3.8.2.1.3 Egan Crest Trailhead

The Egan Crest Trailhead has picnic tables, grills, a gravel parking lot, an information kiosk, and a developed trail system. The trailhead is accessed on the north side of U.S. 50, approximately 8 miles west of Ely. The trail system has three loops north of the trail head (BLM, 2001a).

3.8.2.1.4 Goshute Creek Recreation Area

The Goshute Creek Recreation Area is approximately 60 miles north of Ely via White Pine County Road 21. The area offers hiking, picnicking, hunting, fishing, and camping (Nevada Commission on Tourism, 2005).

TABLE 3.8-1

Developed BLM Recreation Sites within 50 Miles of the Project Area

Recreation Area	Recreational Opportunities	Annual Visitation (visitor days)	Approximate Size (acres)	Distance to Proposed Action Project Site (miles)
Egan Crest Trailhead	Hiking, picnicking	7,232	65,000	41
Goshute Creek	Hiking, picnicking, hunting, fishing, camping	352	40	27
Garnett Hill	Fishing, wildlife observation, hiking, mineral collecting	10,200	1,280	22.5
Cleve Creek Campground	Fishing, hiking, mountain biking, camping, and cross-country skiing	10,055	40	23
Ward Mountain	Hiking, biking, picnicking, campground, bird watching, off-highway vehicle trails, hunting, Nordic skiing, snowshoeing	8,125	40	43

Source: Recreation (2005); (BLM 2001a); Nevada Commission on Tourism (2005); Reserve (2005); Tribble 2005.

3.8.2.1.5 Ward Mountain Recreation Area

More than 20 miles of trails provide year-round use for hiking, trail biking, cross country skiing, motorcycling, and snow machining through the pinyon and juniper forested slopes of Ward Mountain. Campers and picnickers enjoy this beautiful site, jointly administered by the BLM and Forest Service. The Ward Mountain Recreation Area is approximately 10 miles south of Ely via U.S. 6 (Reserve, 2005).

3.8.2.2 Forest Service

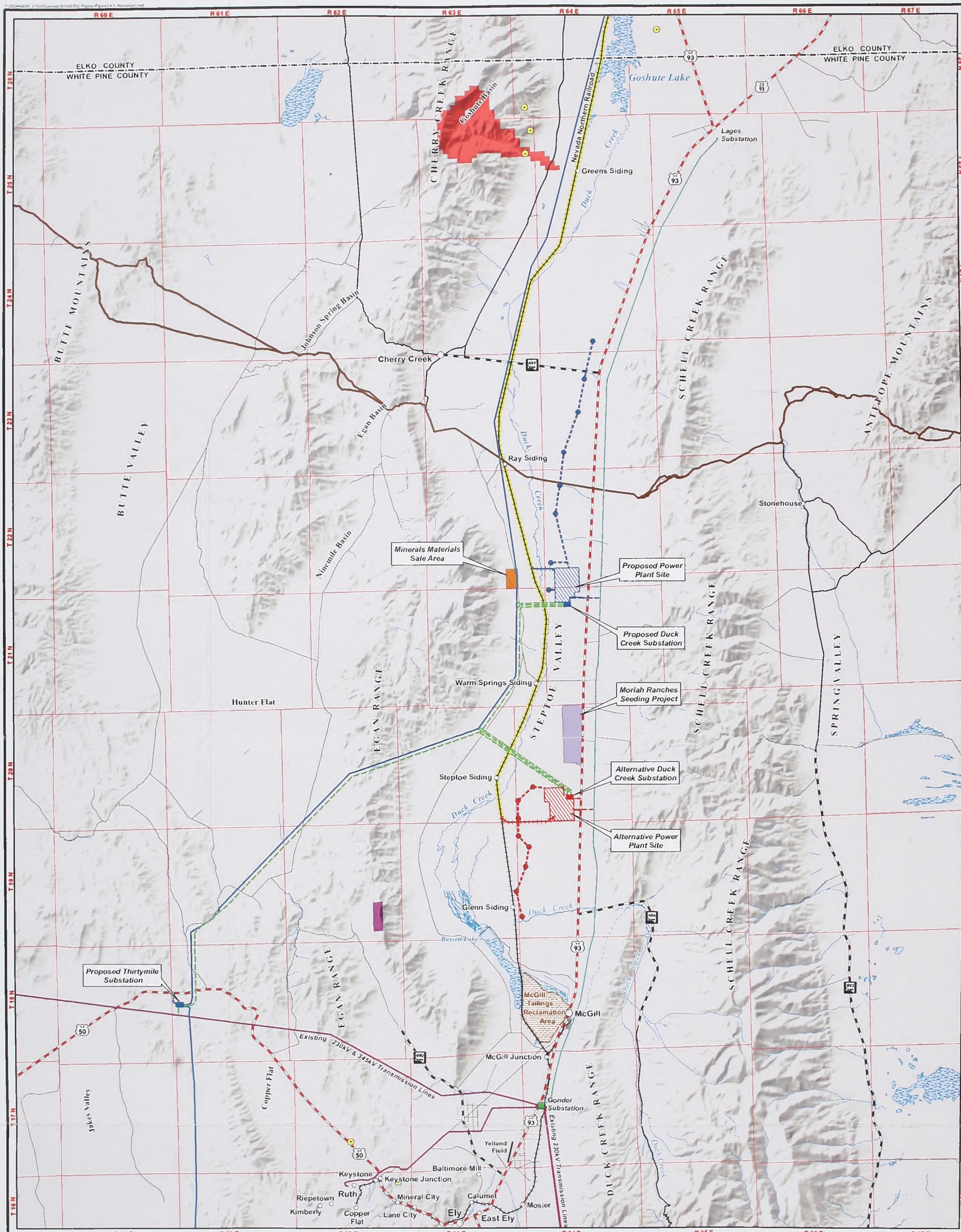
The Ely Ranger District of the Humboldt-Toiyabe National Forest makes up 1.1 million acres of the Humboldt-Toiyabe National Forest and extends over Nye, White Pine, and Lincoln Counties. Ely, Nevada, located in the heart of the Ranger District, is the nearest town and houses the District office. The terrain of this district is mountainous, with elevations ranging from 6,500 feet to more than 12,000 feet above mean sea level. Some of the highest points in Nevada are in the Ely District (USFS, 2005).

The Ely District offers numerous recreational opportunities including camping, trout/bass fishing, big game and bird hunting, wildlife viewing, mountain biking, horseback riding, cross-country skiing, bird watching, and picnicking (USFS, 2005). The following text discusses developed Forest Service recreation areas within 50 miles of the project route alternatives.

3.8.2.2.1 East Creek Campground

The East Creek Campground is approximately 12 miles northeast of McGill off of Forest Service Road 427. The campground has seven campsites for both recreational vehicles (RVs) and tents, fire pits, cooking grills, and two vault toilets. East Creek runs through the middle of the picnic area.

Hiking is the primary recreational activity (USFS, 2006).



Developed Recreation Sites
White Pine Energy Station Project

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

- Recreation Site
- Pony Express Trail
- Goshute Canyon Natural Area
- Heusser Mountain Bristlecone Pine Natural Area

Project Area
NEVADA

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Figure 3.8-1

3.8.2.2.2 Bird Creek Campground

The Bird Creek Campground is approximately 14 miles northeast of McGill off of Forest Service Road 426. The campground has eight group use sites for both RVs and tents, concrete pads, fire pits and cooking grills, drinking water, and a vault toilet. Bird Creek, a perennial stream, runs through the middle of the picnic area. Hiking is the primary recreational activity (USFS, 2006).

3.8.2.2.3 Timber Creek Campground

The Timber Creek Campground is approximately 16 miles northeast of McGill off of Forest Service Road 425. It has six single sites and six group sites for both RVs and tents. The campground offers concrete pads, fire pits and cooking grills, drinking water, vault toilets, and a playground with a sandbox. Timber Creek, a perennial stream, runs through the middle of the campground, and all campsites are located near the stream. Hiking, nature/wildlife viewing, and horseback riding are the primary recreational activities (USFS, 2006).

3.8.2.2.4 Ward Mountain Recreation Area

The Ward Mountain Recreation Area is jointly administered by the Forest Service and BLM and was discussed in Section 3.8.2.1, *Bureau of Land Management.*

3.8.2.2.5 White River Campground

The White River Campground is approximately 34 miles southeast of Ely off of Forest Service Road 1163. It has ten sites with fire pits, camping grills, and vault toilets. The primary recreational activities are hiking, sightseeing, wildlife/nature viewing, backpacking, hunting, and all-terrain vehicle/off-highway vehicle riding (USFS, 2006).

3.8.2.2.6 Berry Creek Campground

The Berry Creek Campground is approximately 20 miles east of McGill off of Forest Service Road 424. It has five sites for RVs and tents and offers fire pits, cooking grills, and a vault toilet. Berry Creek, a perennial stream, runs through the campground. Primary recreational activities include hiking and wildlife/ nature viewing (USFS, 2006).

3.8.2.3 National Historic Trails

The Pony Express National Historic Trail (see Figure 3.8-1) was established as a National Historic Trail by Congress in 1992. The Pony Express route was established in 1860 to transport mail from Missouri to California and within Nevada. The trail symbolizes American's rapid expansion to the Pacific (National Park Service, 2005). The Pony Express National Historic Trail runs approximately east-west through the BLM Ely District in the analysis area. The Pony Express National Historic Trail enters Steptoe Valley via Egan Canyon. The trail is administered by the National Trails System, Salt Lake City, Utah, office, but responsibility for management of the trail lies in the hands of current trail managers at the federal, state, local, and private levels. The Pony Express Trail is located almost entirely on BLM managed lands in the project area.

Recreational uses of the trail include hiking, biking, horseback riding, and historic reenactments of the trail experience. Use of the trail is increasing because of heritage tourism (people rediscovering their past), commemorative activities, and media interest (National Park Service, 2005).

3.8.3 Recreational Opportunities on State Lands

3.8.3.1 Cave Lake State Park

Cave Lake State Park is approximately 15 miles southeast of Ely via SR 486. The 32-acre reservoir at Cave Lake State Park is popular for trout fishing, boating, picnicking, and camping. The park is located in the Schell Creek Range at an elevation of 7,300 feet, offering scenic views and opportunities for nature study and photography. Facilities include campgrounds, picnic areas, hiking trails, and a boat launch. Winter sports such as ice fishing, cross-country skiing, and ice-skating also are available. According to the Nevada Division of State Parks (Nevada Division of State Parks), Cave Lake is open all year, weather permitting (Nevada Division of State Parks, 2005). Visitation at Cave Lake for the year 2004 was 96,389 (Manning, 2005).

3.8.3.2 Comins Lake

Comins Lake is approximately 10 miles southeast of Ely via U.S. 50/6/93. Originally established by the realignment of U.S. 93 that created a dam, it is fed by Steptoe, Cave, and Willow Creeks. At capacity, the lake covers 410 surface acres and has a maximum depth of 15 feet. In 1999, the lake and the adjacent 3-C Ranch were purchased by the Nevada Department of Wildlife (NDOW). The lake is now managed to maximize fisheries resources and is inhabited by rainbow trout, brown trout, largemouth bass, and northern pike. In 2003, there were 23,251 angler-use days at Comins Lake (Crookshanks, 2005). There is a primitive boat launch and restrooms on site; however, no overnight camping or fires are permitted (NDOW, 2006).

3.8.3.3 Ward Charcoal Ovens State Historic Park

The Ward Charcoal Ovens State Historic Park is approximately 18 miles south of Ely via U.S. 50/6/93 and is known for its six historic charcoal ovens. These beehive-shaped ovens were used in the late 19th century to generate charcoal for use in the mines of nearby Ward. Today, the park offers limited facilities for picnicking and camping. Other features include forested woodlands, riparian areas, and views of Steptoe Valley and the surrounding mountains (Nevada Division of State Parks, 2005). Annual visitation at the Ward Charcoal Ovens in 2004 was 5,270 (Manning, 2005).

3.8.4 Recreational Opportunities on County Lands

Recreational facilities owned and operated by White Pine County include a golf course, tennis courts, numerous ball parks, six town parks, neighborhood parks, a shooting range, a summer swimming hole, and playgrounds (White Pine County 2005b). These facilities are located in the City of Ely and the community of McGill. The county also operates the White Pine County Rodeo Grounds and Fairgrounds north of Ely. Additionally, the City of Ely owns and operates the Ghost Train, which is a tourist train operation along the portion of the NNR from Keystone to McGill Junction. Other recreational opportunities in White Pine County are provided on state and federal lands. The varied outdoor recreational opportunities include camping, hiking, fishing, backpacking, horseback riding, all-terrain vehicle riding, mountain biking, cross-country skiing, snowmobiling, nature photography, wildlife viewing, and hunting.

3.8.5 Private Recreational Opportunities

3.8.5.1 Basset Lake

Basset Lake is approximately 4 miles northwest of McGill off of U.S. 93. Originally established in 1942 as a settling pond for mill tailings from local copper mines, it is now owned by the Kennecott Copper Corporation. At capacity, Basset Lake covers 77 surface acres and has an average depth of 5 feet. Its primary water source is Tailings Creek. It contains northern pike, largemouth bass, and a sizeable population of nuisance carp. In 2003, there were 670 angler-use days at Basset Lake (Crookshanks, 2005). There is a primitive boat ramp; however, no restrooms or overnight camping facilities exist at the lake (NDOW, 2006).

3.8.5.2 Campgrounds and RV Parks

Several private campgrounds and RV parks exist near the project area. Table 3.8-2 lists these campground and RV parks.

3.8.6 Recreation Management Plans and Policies

A number of land management plans and policies exist in the project area. These include BLM Resource Management Plans, the *Statewide Comprehensive Outdoor Recreation Plan* (SCORP), and county land use regulations. These plans and policies as they relate to recreation opportunities are described further below.

TABLE 3.8-2

Private Campgrounds and RV Parks within 50 Miles of the Project Area

Name	Amenities	Size	Distance to Proposed Action Project Site (miles)
Ely KOA Campground	Full hook-ups, cable TV, phones, pets, playground, tent sites, horse boarding	100 sites; 20 mobile home sites; 2 cabins	35.5
Harry's Wilderness Station	Full hook-ups	10 sites	32
Holiday Inn and Prospector's Casino	Phone, dining, slots, laundry, indoor pool	13 sites; 61 hotel rooms	33
Lanes Ranch RV Park	Cable TV, phones, store, pets, gas	7 sites; 15 motel rooms	57
Major's Station RV Park	Phone, slots, bar	7 sites	59
Schellbourne Station Motel and RV Park	Gas, dining, gaming, pets	18 sites; 5 motel rooms	7
Valley View RV Park	Cable, phones, propane, showers, laundry	46 sites	32
West End RV Park	None	11 sites	33

Source: White Pine Tourism, 2006

3.8.6.1 BLM Resource Management Plans

The Egan Resource Area Resource Management Plan is a 20-year plan to manage 3.8 million acres of public land in east-central Nevada by the Ely Field Office of the BLM (BLM, 1984b). Most of the resource area is in White Pine County, although portions are in Nye and Lincoln Counties. The Resource Management Plan focuses on several resource issues including rangeland management, realty actions, wilderness, riparian areas, off-highway vehicle management, and special management areas. Section 3.11, *Wilderness,* discusses more recent Wilderness designations. Management objectives related to recreation are summarized as follows:

- Recommend portions of three WSAs as suitable for possible wilderness designation, including Goshute Canyon, Park Range, Riordan's Well, and South Egan Range.
- Continue existing multiple-use activities on possible WSAs; however, allow new or expanded uses only if the impacts would not impair the area's suitability for designation as wilderness.
- Continue to protect all WSAs under the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review until congress recommends that they become a National Wilderness Area.

Additionally, certain management actions related to recreation were carried forward from previous land use plans. These actions as they relate to recreation in the analysis area are summarized as follows:

- The Garnett Fields Rockhounding Area would continue to be managed for recreational rockhounding.
- Protect public fishing opportunities by retaining federal ownership of lands adjacent to Duck, East, Berry, and Egan Creeks.

3.8.6.2 NPS/USFS/FWS Management Plans

National Park Service Historic Trails Management Plan

The National Park Service completed a *Comprehensive Management and Use Plan and Final EIS* in 1999 for the Pony Express National Historic Trail along with three other historic trails. The document focuses on the trail's purpose and significance, issues, and concerns related to current conditions along the trail, resource protection, visitor experience and use, and long-term administrative and management objectives.

The plan identifies high-potential route segments and sites. High-potential segments are "Those portions of trail which would afford a high quality recreation experience in a portion of the route having greater-than-average scenic values or affording an opportunity to vicariously share in the experience of the original users of the historic route" (National Park Service, 2000). High-potential sites are "Those historic sites related to the route which provide opportunity to interpret the historic significance of the trail during the period of its major use" (National Park Service, 2000). In the analysis area, the National Park Service identifies the Overland Canyon to Simpson Park Station segment of the Pony Express National Historic Trail as a high-potential segment.

3.8.6.3 State Plans and Policies

The SCORP, prepared by the Nevada Division of State Parks (1992), provides an assessment of Nevada's characteristics, people, resources, and recreational activities and critical recreation issues facing the state. The SCORP identifies the major recreation sites in Nevada.

According to the plan, the outdoor recreational activity with the highest actual participation rate in Nevada (90 percent of telephone survey respondents) was defined as "relaxing outdoors." Hiking, walking, picnicking, and pleasure driving were also popular, with about 75 percent of all respondents participating in these activities (Nevada Division of State Parks, 1999).

The SCORP also identifies future recreation issues and actions for the state as a whole. One of the issues applicable to the proposed project is the protection of Nevada's scenic resources, including "undisturbed mountainous areas that are not impaired by development (including roads, open mines, transmission towers, etc)." The actions to protect these resources are to: (1) prepare resource protection plans in parks with substantial natural, cultural, or scenic resources; (2) identify all areas that are environmentally sensitive; and (3) encourage other public landowners to utilize their properties as parkland and preserve sensitive areas for their scenic resources.

Another applicable issue identified in the plan is the protection of public access to public lands. The actions to address this issue include: (1) land exchanges, easements, ROWs, purchases, or cooperative agreements; and (2) acquisition of ROWs to public lands that are blocked by private lands and of in-holdings to solidify public land parcels.

A final applicable issue identified in the SCORP is the need to provide recreational, multiple-use trails in "wildland-urban interface" areas. The actions to address this issue include: (1) encourage trails on existing public and quasi-public lands (lands with attributes similar to public lands), and (2) encourage area-wide trail planning to develop master trail systems and connectors.

Visitation of developed, and especially dispersed recreational sites in Nevada, including those in the project area, has been increasing (Tribble, 2005). Visitation will likely continue to increase proportionately with the growing statewide population.

3.8.6.4 County Plans and Policies

3.8.6.4.1 White Pine County Land Use Plan

The White Pine County Land Use Plan (White Pine County, 1998a) encourages development of county-wide recreation areas and supports activities by participating in county-wide youth programs and activities, enhancing and preserving existing recreational facilities, and supporting new recreational facilities in the county.

3.8.6.4.2 White Pine County Public Land Use Plan

The White Pine County Public Land Use Plan (White Pine County, 1998b), a coordinated land use planning effort among the county, BLM, and Forest Service, encourages dispersed recreational opportunities. The plan also states that federally managed lands with the value for concentrated recreation use (campgrounds, water recreation sites, etc.) should be identified, developed, and managed for recreational purposes.

3.9 Land Use

Land use studies involved a review of related county, state, and federal land use plans, as well as land use plats and other land records. Data were compiled to assess potential land use impacts from the construction, operation, and maintenance of the proposed White Pine Energy Station power plant, transmission lines, water lines, access roads, and railroad spur. Potential impacts are assessed in Chapter 4.

3.9.1 Existing Land Use and Land Ownership

3.9.1.1 Land Use in the Project Area

The project would be located entirely in White Pine County, Nevada, approximately 26 miles south of the White Pine County/ Elko County line and approximately 40 miles west of the Nevada/Utah border. Prominent landmarks in the project area include U.S. 93 and the Schell Creek Range (in the Humboldt-Toiyabe National Forest, Ely Field Office) to the east; Duck Creek and the Egan Range to the west; and Goshute Lake to the north. The City of Ely is approximately 34 miles and 22 miles south, respectively, of the Proposed Action and Alternative 1 power plant sites. Ely is at 6,427 feet in elevation and has a population of approximately 4,041 people. The community of McGill is approximately 22 miles and 10 miles south, respectively, of the Proposed Action and Alternative 1 power plant sites. McGill sits at an elevation of 6,210 feet and has a population of approximately 1,054 people (City-data, 2005). Great Basin National Park, also in White Pine County, is approximately 57 miles to the southeast.

Land in the project area is primarily used for grazing. Other land uses in the area include recreation and small areas of commercial, agriculture, industrial, and residential uses. The project area includes a number of grazing allotments on federal lands. These allotments are open range lands used periodically for cattle grazing or that have the potential to be used for grazing. Allotments are grazed at different times of the year and at varying intensities. Section 3.10, *Rangeland Resources*, provides additional detail about grazing allotments.

At one time, White Pine County was the largest mineral wealth producing county in Nevada; however, only 41 active claims currently exist in or near the project area in Steptoe Valley (BLM, 2005b). The Telegraph, Hunter, and Granite Mining Districts all fall within the project area. Not all lands in the mining districts are actively mined today. Mining districts only indicate the general potential for extractive activities in these areas. Active mining claims exist in the mining districts. An active mining claim is a pre-existing, legal right to explore for mineral resources, and is filed annually with the BLM and counties in which they are located.

Transportation routes located within the project area include U.S. highways, state highways, major and minor White Pine County roads, and a railroad line. Several minor dirt roads would be improved for construction access purposes and new access roads would be constructed as described in Chapter 2, *Description of Proposed Action and Alternatives.*

3.9.1.2 Land Ownership Status

Two major categories of land ownership status were identified in the area: (1) federal land, and (2) privately held land. Table 3.9-1 lists the primary land managers within 30 miles of the project area. The BLM administers the vast majority of land in the project area (approximately 79 percent) through the BLM Ely District Field Office. Approximately 16 percent of the land is federally owned by other agencies and approximately 5 percent is privately owned.

TABLE 3.9-1

Land Ownership Status within White Pine County

Land Status Category within White Pine County	Acres	Percent
BLM	4,932,718	78.82
Forest Service, National Park Service, Bureau of Indian Affairs, Department of Defense	992,147	15.86
Private	301,850	4.82
State Of Nevada	6,512	0.10
Other (water)	24,772	0.40
Total	6,257,999	100.00

Source: EDAW GIS analysis, May 2005

On December 20, 2006, President Bush signed into law the White Pine County Conservation, Recreation and Development Act of 2006 (PL 109-432) which requires that four parcels of land containing approximately 3,526 acres in Steptoe Valley (including a portion of the Alternative 1 power plant site described as the SW1/4 and SE1/4 of the NW1/4 of Section 28, containing 80 acres more or less) be held in trust by the United States for the benefit of the Ely Shoshone Tribe. Formal processing of this land transfer has not yet been completed and the subject land remains under the administrative jurisdiction of the BLM. It is understood that the Tribe plans to use said lands in the immediate vicinity of the proposed White Pine Energy Station for economic/energy related industrial development purposes.

Figure 3.9-1 shows land ownership in White Pine County. The largest privately held landholdings include the following:

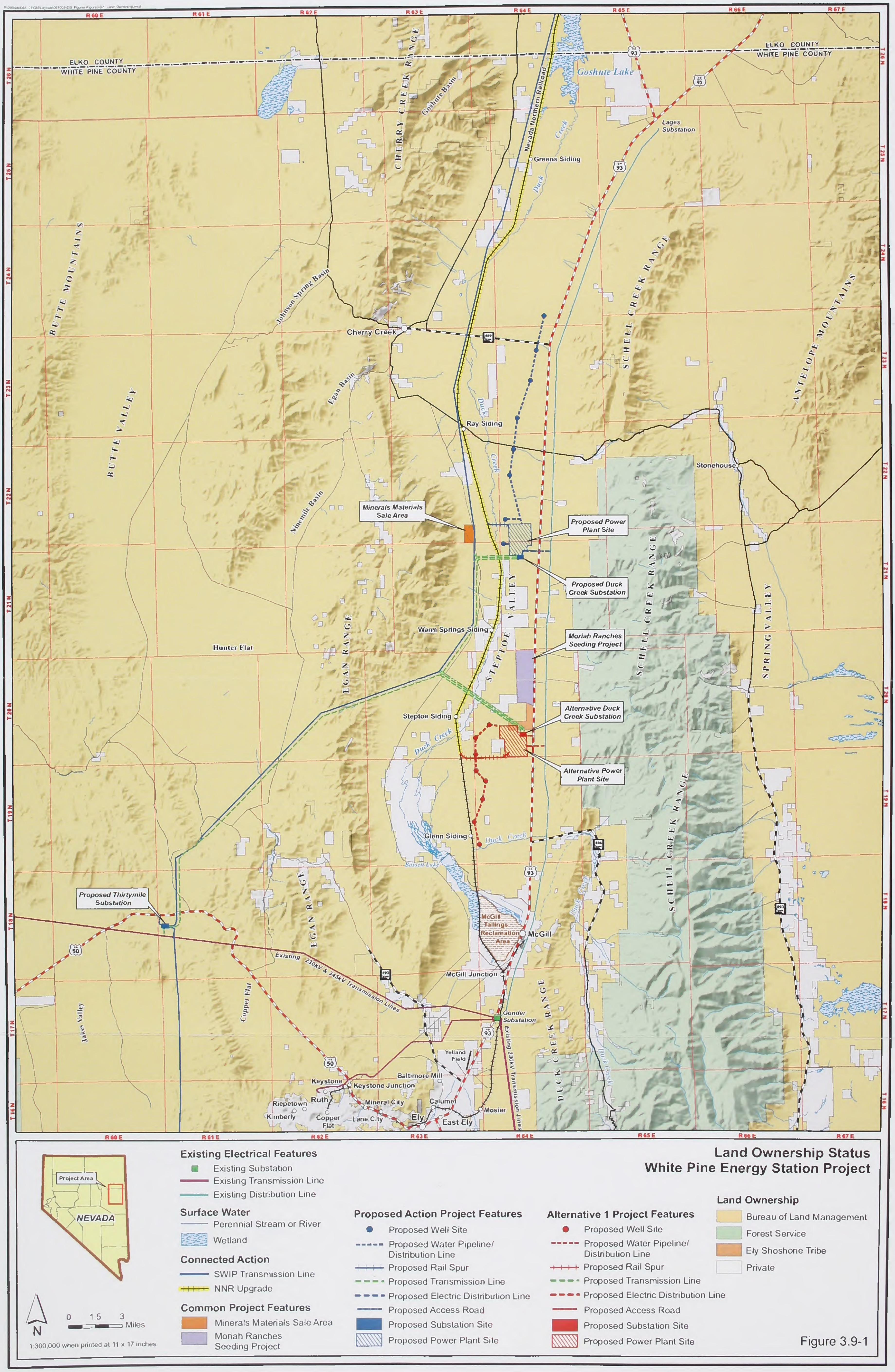
- One owner holding approximately 2,013 acres in various parcels in T20N, R64E and T20N, R63E
- One owner holding approximately 1,920 acres in various parcels in T26N, R65E
- One owner holding approximately 710 acres in various parcels in T21N, R64E
- One owner holding approximately 640 acres in various parcels in T20N, R64E
- One owner holding approximately 600 acres in one parcel in T21N, R64E

Figure 3.9-1 also shows public land transferred to the Ely Shoshone Tribe pursuant to Subtitle F, Section 361, of the White Pine County Conservation, Recreation, and Development Act of 2006 (PL 109-432).

3.9.2 Designated Land Use

3.9.2.1 BLM Land Use Authorizations

The BLM grants land use authorizations that allow private entities and other government agencies to use BLM lands for specific purposes. Most land use authorizations in the project area are ROWs for roads and utilities.



Land Ownership Status
White Pine Energy Station Project
Existing Electrical Features
Existing Substation
Existing Transmission Line
Existing Distribution Line
Surface Water
Perennial Stream or River
Wetland
Connected Action
SWIP Transmission Line
NNR Upgrade
Common Project Features
Minerals Materials Sale Area
Moriah Ranches Seeding Project
Proposed Action Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Alternative 1 Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Land Ownership
Bureau of Land Management
Forest Service
Ely Shoshone Tribe
Private
Project Area
NEVADA
0 1.5 3 Miles
1:300,000 when printed at 11 x 17 inches
ELKO COUNTY
WHITE PINE COUNTY
Goshute Lake
Lages Substation
Greens Siding
Nevada Northern Railroad
CHERRY CREEK RANGE
Goshute Basin
Cherry Creek
Johnson Spring Basin
BUTTE MOUNTAINS
BUTTE VALLEY
Egan Basin
Ray Siding
Duck Creek
SCHELL CREEK RANGE
ANTELOPE MOUNTAINS
Stonehouse
Nimemile Basin
Minerals Materials Sale Area
Proposed Power Plant Site
Proposed Duck Creek Substation
Warm Springs Siding
Hunter Flat
EGAN RANGE
STEPTOE VALLEY
Moriah Ranches Seeding Project
SPRING VALLEY
Steptoe Siding
Alternative Duck Creek Substation
Alternative Power Plant Site
Glenn Siding
Bassett Lake
Proposed Thirtymile Substation
McGill Tailings Reclamation Area
McGill
McGill Junction
Existing 230kV & 345kV Transmission Lines
Copper Flat
Jakes Valley
Gonder Substation
Existing 230kV Transmission Lines
DUCK CREEK RANGE
Yelland Field
Baltimore Mill
Keystone
Keystone Junction
Riepetown
Ruth
Kimberly
Copper Flat
Mineral City
Lane City
Calumet
Ely
East Ely
Mosier

Figure 3.9-1

The Legacy Rehost 2000 Database, available at the Nevada BLM State Office in Reno, shows that the BLM has 67 land use authorizations in the project area, comprising approximately 257,508 acres (BLM, 2005b). These authorizations are primarily held by utility companies for transmission lines, roads, telephone lines, and pipelines. Other land use authorizations include recreation or public purpose leases, airport leases, and material sites for road construction.

Land use authorizations in the study area are primarily held by Idaho Power Company, Sierra Pacific Power Company, Nevada Department of Transportation, Mount Wheeler Power Inc., Nevada Bell, WPEA, and the BLM. However, many land use authorizations are also held by other entities, including road authorizations belonging to private individuals and telephone or transmission line authorizations belonging to smaller telecommunications companies (BLM, 2005b).

3.9.2.2 Management Plans and Policies

Use of federal public land in the project area is planned and regulated by the BLM. Use of privately owned land is regulated by White Pine County and the State of Nevada. This section describes applicable land use plans and policies in the project area, including BLM Resource Management Plans and county land use plans as they relate to the proposed project.

3.9.2.2.1 BLM Resource Management Plans

BLM Resource Management Plans are long-range, comprehensive land use plans that are intended to provide for multiple uses and identify planning objectives and policies for designated areas. The planning objectives are implemented through activity plans, such as allotment management plans, wildlife habitat management plans, and wild horse herd management area plans. The Resource Management Plans also provide standard operating procedures that are inherent to the implementation of any federal action on public lands, such as completing environmental analysis before project development (BLM, 2001a).

The proposed project would be located in the Egan Resource Area of the BLM Ely District. Applicable land use objectives and policies from the Egan Resource Area Resource Management Plan are summarized in the following text.

Egan Resource Area Resource Management Plan

The Egan Resource Management Plan is a 20-year plan to manage 3.8 million acres of public land in east-central Nevada by the BLM Ely District Field Office (BLM, 1984b). Most of the resource area is in White Pine County, with portions in Nye and Lincoln Counties. The Resource Management Plan focuses on various resource issues including realty actions, which includes a discussion of utility corridors. Figure 3.9-2 illustrates the current utilities and utility corridors in the project area and is based on information presented in the Egan Resource Management Plan map and amendment. The overall objective of the Egan Resource Management Plan is to provide a balanced approach to land management that protects fragile and unique resources, while not overly restricting the ability of other resources to provide economic goods and services. Management objectives relating specifically to realty actions and to the proposed project are summarized in the following text.

Realty Actions

Sale of BLM Land: Management Objective. Dispose of lands to provide for more effective management of public lands in the planning area. Land disposals are not in big game or upland game habitat or in wild horse herd use areas. All land disposals would be done in a planned and orderly manner and would not adversely affect threatened or endangered species, destroy or degrade wetlands or riparian areas, or lead to the modification of floodplains.

Sale of BLM Land: Relationship to Proposed Project. In addition to the parcel of land that would be selected for the Proposed Action or Alternative 1 power plant site, other lands in the project area have been identified for disposal.

Utility Corridors: Management Objective. Identify two existing utility corridors, one running north-south and one running east-west, and designate two other planned corridors, one running north-south and one running east-west. The actual route would be established after environmental analysis is completed for the ROW, and each corridor would be 5 miles wide to provide opportunities for multiple transmission facilities and selection of routes that minimize environmental degradation in a cost-effective manner. Applicants for use of a corridor would be required to locate new facilities proximate to existing facilities except where considerations of construction feasibility, cost, resource protection, or safety are over-riding. Corridors provide for a variety of ROW uses including power lines, pipelines, railroads, and highways. The major use expected in the Resource Management Plan area is related to installation of transmission lines.

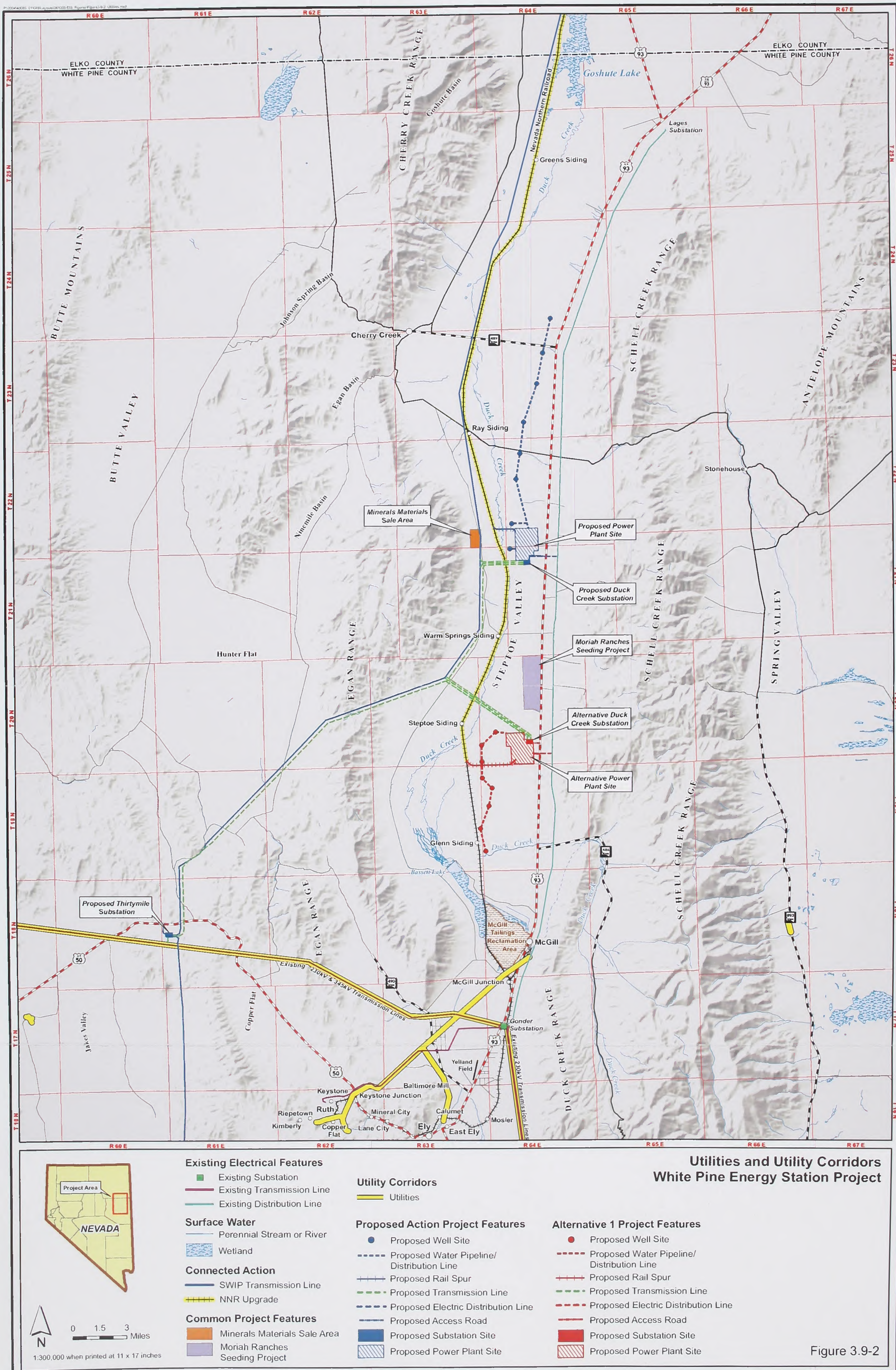
Utility Corridors: Relationship to Proposed Project. Most of the length of the transmission lines for the proposed project would be located within the existing SWIP utility corridor (31 of 34 miles for the Proposed Action and 24 of 28.5 miles for Alternative 1).

3.9.2.2.2 County Land Use Plans and Policies

White Pine County Land Use Plan

The White Pine County Land Use Plan (White Pine County, 1998a) is intended to guide development of land resources in the county through 2017. Sustaining environmental values and promoting expansion and diversification of the regional economy are important goals expressed in the plan. The White Pine County Land Use Plan describes land use issues in the county, as well as in the specific planning areas of Ely, Baker, Lund, McGill, Preston, Ruth, and the Ely-McGill corridor. The plan also provides a number of land use goals and implementation strategies; however, it contains no goals or strategies related specifically to utilities or utility corridors, other than a provision for the efficient use of community infrastructure.

White Pine County has 11 general land use designations: Open Range; Low-, Medium-, and High-Density Residential; Mobile Home; Commercial; Industrial; Public Facility/Recreation; Public Land Transfer; Brownfield; and Federal Reserve. Most land outside of established communities is designated as Open Range or Federal Reserve. The proposed project area lies predominantly within these two land use designations.



Utilities and Utility Corridors White Pine Energy Station Project

Figure 3.9-2

Lands within the Open Range designation comprise most of the land in the county and include lands administered by the BLM, as well as those under private ownership. Open Range lands are utilized primarily for grazing or domestic livestock, although other uses include mining, recreation, and wildlife habitat. The intent of the Open Range designation is to encourage the resource and open space use of the lands. The minimum lot area requirement for Open Range designation is 5 acres. In Steptoe Valley north of McGill, areas have been designated Low-Density Residential with a ranch estates overlay. The intent of these areas is to encourage development of irrigated estate ranches utilizing ground water held by White Pine County. This designation reflects a growing demand for recreational home sites in desirable mountain settings in the county (White Pine County, 1998a).

White Pine County Public Land Use Plan

The White Pine County Public Land Use Plan (White Pine County 1998b) provides a coordinated land use planning effort among the county, BLM, and Forest Service and is included as an appendix to the White Pine County Land Use Plan. The plan was developed by the White Pine County government to guide the use of federal public lands and resources in the county, and provides a number of policy statements related to water, minerals, agriculture, recreation, wildlife, transportation, cultural resources, wild horses, forest management, and public lands identified for non-federal ownership. In general, the public land policies encourage mineral exploration, opportunities for livestock grazing, and other agricultural uses; encourage dispersed recreational opportunities; and support a diversity of wildlife species and habitats. Related to access and transportation, the plan encourages route locations for transportation, utilities, and communication corridors to be planned in harmony with other resources on public lands.

The White Pine County Public Land Use Plan applies to public lands designated as Open Range and Federal Reserve in the White Pine County Land Use Plan. No parcels of public land in the project area have been identified as desirable for transfer from the BLM to local government for community expansion purposes, including, but not limited to, roads, trails, or other access points to public and private lands.

sands within the Coast Range [illegible] to provide most of the land to the [illegible] and reduce basic [illegible] BLM, as well as [illegible] information. Coast Range [illegible] primarily [illegible] [illegible] The selected [illegible] [illegible] space use of the lands [illegible] area requirements [illegible] designated [illegible] needs of Mid [illegible] designated [illegible] small existing [illegible] [illegible] impacts [illegible] designation [illegible] [illegible] [illegible] County, [illegible]

[illegible] River Gorge [illegible]

The White River Gorge [illegible] [illegible] [illegible] [illegible] BLM, and [illegible] Service [illegible] the White River [illegible] [illegible] County [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] transportation, [illegible] [illegible] In general, the [illegible] [illegible] opportunities for [illegible] [illegible] [illegible] [illegible]

3.10 Rangeland Resources

3.10.1 Livestock Grazing

The Taylor Grazing Act of 1934 (the Act) was passed by Congress to help reduce the threat of overgrazing on public lands. The Act regulated grazing on public lands by requiring permits. It provided a way to regulate the occupancy and use of public land and protect it from ruin. The Public Land Law Review Commission was created in 1964 to provide recommendations on how public land should be managed. Their report resulted in the Federal Land Policy and Management Act (FLPMA), enacted by Congress in 1976.

The study area for livestock grazing is a 10-mile radius surrounding the White Pine Energy Station Proposed Action and Alternative 1 project facility sites. The size of the study area is appropriate for rangeland resources given the general range of animal movements and includes the power plant site, transmission line alignment, well field and water line ROW, and access roads ROW. The cumulative effects analysis area involves the public and private lands crossed by potential power transmission line and water pipeline routes, substations, and rail line. The cumulative effects analysis area includes all affected allotments.

Sixty-three grazing allotments exist in the BLM's Ely District. Lands in the project area are primarily used for grazing. As shown in Table 3.10-1, the area includes a number of grazing allotments on federal lands. These allotments are open rangelands that have the potential to be used periodically for grazing. Allotments are grazed at different times of the year and at various intensities. Figure 3.10-1 shows the location of the various grazing allotments in relation to the Station Proposed Action and Alternative 1 project facility sites.

3.10.2 Wild Horses

On December 15, 1971, Congress enacted the Wild and Free-Roaming Horse and Burro Act, authorizing the BLM to manage wild horses and burros on public lands and mandating that wild and free-roaming horses and burros be protected from unauthorized capture, branding, harassment, or death. Those areas of public land that were used as habitat for wild horses and burros in 1971 were delineated as Herd Management Areas (HMAs). The BLM's policy is to protect, manage, and control wild horses and burros on public lands.

The study area and cumulative effects analysis area for wild horses is the same as defined above for livestock grazing in Section 3.10.1, *Livestock Grazing*.

Thirteen HMAs exist in the BLM's Ely Field Office District. Figure 3.10-2 shows the HMAs within the study area. The Butte and Antelope HMAs would be crossed by the proposed transmission line and water supply line, respectively. Wild horses are present, but no wild burros have been recorded in either HMA.

3.10.2.1 Butte HMA

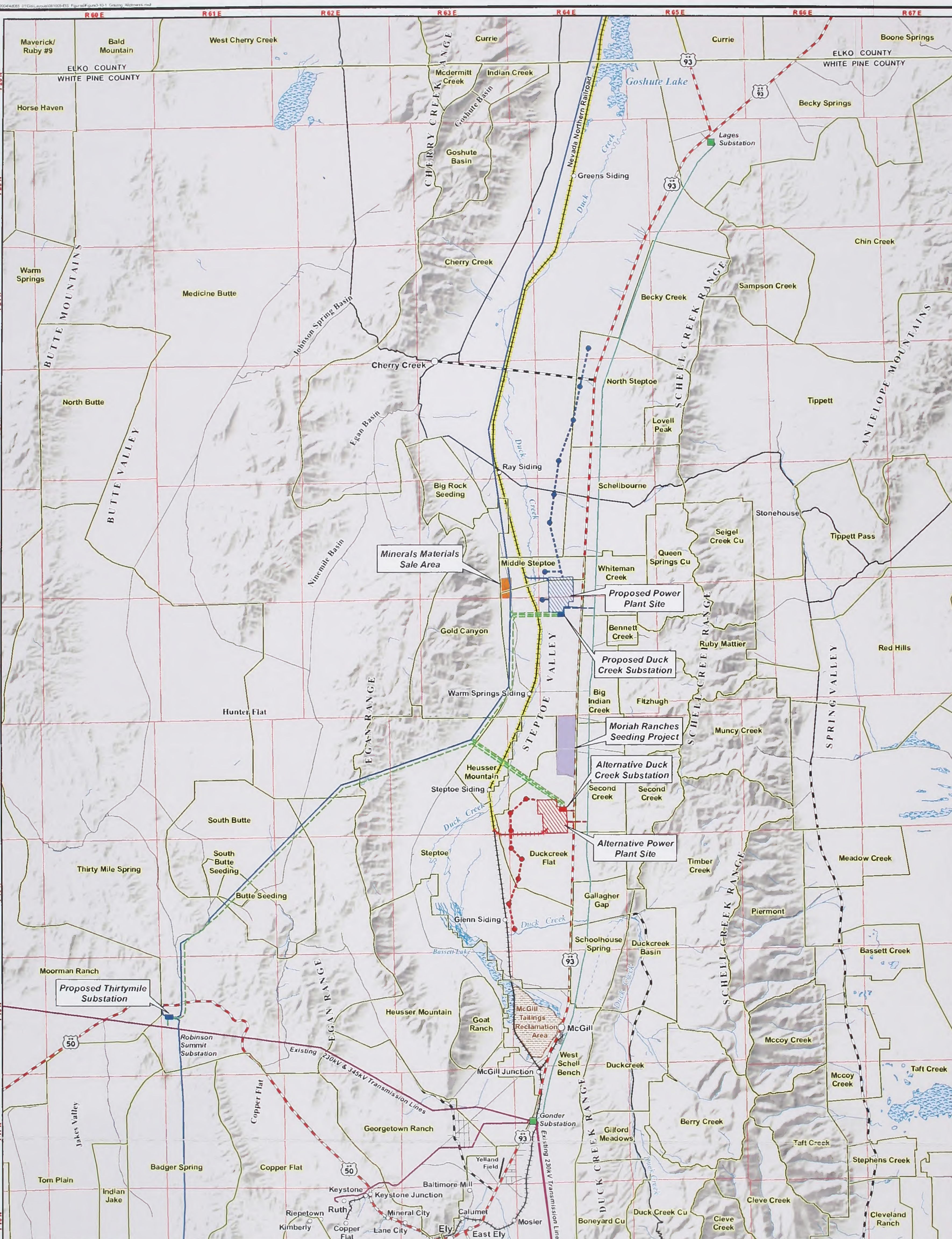
The Butte HMA is approximately 30 miles north-northwest of Ely, 3 miles west of the Proposed Action power plant site, and 6 miles west of the Alternative 1 power plant site. The Butte HMA encompasses approximately 430,770 acres (673 square miles), 99.3 percent of which are public lands.

TABLE 3.10-1

Grazing Allotments in the Study Area*

Name	Size (acres)	Name	Size (acres)
Badger Spring	28,240	McDermitt Creek	2,703
Bassett Creek	9,091	Meadow Creek	9,330
Becky Creek	14,086	Medicine Butte	310,965
Becky Springs	44,766	Middle Steptoe	3,696
Bennett Creek	1,509	Moorman Ranch	66,946
Berry Creek	18,175	Muncy Creek	53,253
Big Indian Creek	6,417	Negro Creek	90
Big Rock Seeding	6,957	North Butte	27,896
Boneyard Cu	8,444	North Steptoe	15,606
Butte Seeding	1,522	Piermont	21,076
Cherry Creek	166,219	Queen Springs Cu	9,890
Chin Creek	50,230	Red Hills	28,202
Cleve Creek	16,698	Ruby Mattier	11,221
Cleveland Ranch	7,583	Sampson Creek	13,645
Copper Flat	41,308	Schellbourne	17,986
Duck Creek Cu	9,256	Schoolhouse Spring	6,656
Duckcreek	12,664	Second Creek	17,236
Duckcreek Basin	10,605	Seigel Creek Cu	11,689
Duckcreek Flat	37,334	South Butte	27,829
Fitzhugh	10,407	South Butte Seeding	981
Gallagher Gap	3,899	Stephens Creek	4,380
Georgetown Ranch	29,455	Steptoe	58,120
Gilford Meadows	5,608	Taft Creek	34,778
Goat Ranch	6,074	Thirty Mile Spring	188,865
Gold Canyon	23,673	Timber Creek	34,795
Goshute Basin	9,911	Tippett	68,917
Heusser Mountain	41,714	Tippett Pass	33,433
Horse Haven	22,438	Tom Plain	33,864
Indian Creek	3,316	Warm Springs	64,122
Indian Jake	5,089	West Schell Bench	37,133
Lovell Peak	2,418	Whiteman Creek	5,897
Mccoy Creek	20,037		
		Total	**2,229,573**

* Study area is a 10-mile radius around the Station Proposed Action and Alternative 1 facility sites.
Source: GIS data provided by BLM Elko, Nevada Field Office, March 1, 2005



Project Area

NEVADA

0 1.5 3 Miles

N

1:300,000 when printed at 11 x 17 inches

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

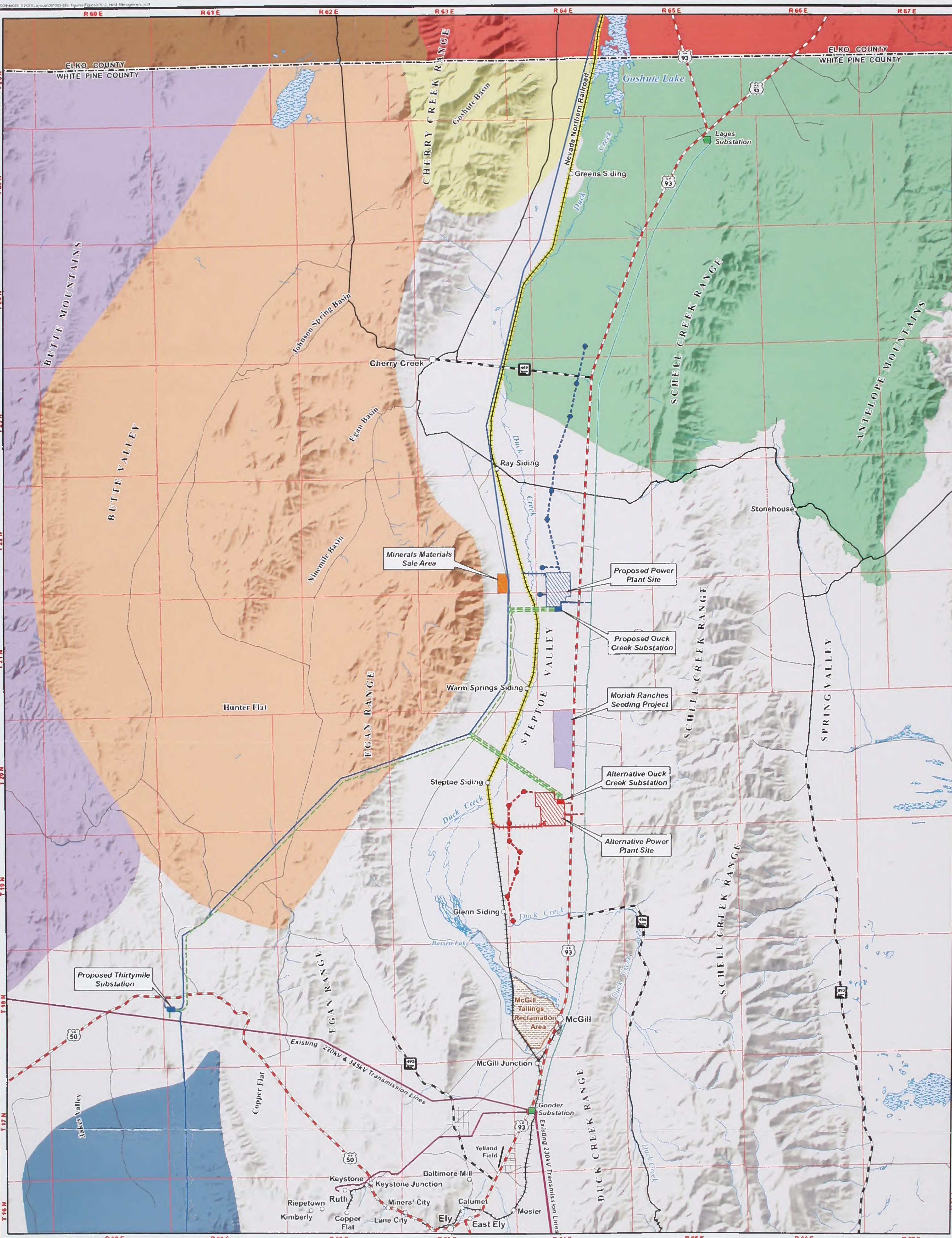
Grazing Allotment
- Grazing Allotment

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Grazing Allotments
White Pine Energy Station Project

Figure 3.10-1



Existing Electrical Features

- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water

- Perennial Stream or River
- Wetland

Connected Action

- SWIP Transmission Line
- NNR Upgrade

Common Project Features

- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features

- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Alternative 1 Project Features

- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Herd Management Areas

- Antelope
- Buck and Bald
- Butte
- Cherry Creek
- Jakes Wash
- Antelope Valley
- Maverick-Medicine

Project Area

NEVADA

N

0 1.5 3 Miles

1:300,000 when printed at 11 x 17 inches

Herd Management Areas
White Pine Energy Station Project

Figure 3.10-2

Access to the Butte HMA is provided only over dirt roads and trails. The only significant human settlements in the vicinity are Ely and McGill. Other human settlements include a few small ranches.

The Butte HMA is a large valley bounded on the east, south, and west by the Butte, Egan, and Cherry Creek mountain ranges, respectively, and on the north by the White Pine County line. The southeastern edge of the Butte HMA extends to the eastern bench of the Egan Range.

Table 3.10-2 shows the HMAs and their various characteristics. The Butte HMA has an appropriate management level of 95 wild horses. This number is based on a series of multiple-use decisions between 1991 and 2001 indicating that the approximate number of wild horses that could be sustained in the area without interrupting the balance of the ecosystem. The population as of March 2005 was 124 (Bybee, 2005). The wild horses tend to gather in the higher elevations in summer and lower elevations in winter and are rarely observed in the southern section of the Butte HMA (Bybee, 2005).

TABLE 3.10-2
Wild Horse HMA Characteristics

HMA	Size (Acres)	Appropriate Management Level	Current Population
Antelope	400,205	324	160[a]
Butte	430,770	95	124[b]

[a]February 2005
[b]March 2005

3.10.2.2 Antelope HMA

The Antelope HMA is approximately 42 miles north of Ely, 9 miles north of the Proposed Action power plant site, and 20 miles north of the Alternative 1 power plant site. The Antelope HMA comprises approximately 400,205 acres (625 square miles), 98 percent of which are public lands. Access to the Antelope HMA is provided by U.S. 93 and various state highways, dirt roads, and trails. The only significant human settlement in the vicinity is the community of Cherry Creek. Other human settlements include a few small ranches.

The Antelope HMA spans Steptoe Valley and Spring Valley. Steptoe Valley is the only section of the HMA that would be affected by the Proposed Action water supply line. The Antelope HMA is bounded on the west by the NNR. SR 893 runs just south of the HMA's southern border. The White Pine County line forms the eastern and northern borders. The mountain ranges in the Antelope HMA are the Schell Creek Range and Antelope Mountains. A fence runs the length of U.S. 93 through the Antelope HMA. This fence prohibits horses from entering the area where the Proposed Action water supply line would be constructed.

The Antelope HMA has an appropriate management level of 324 wild horses (see Table 3.10-2). This number is based on a series of multiple use decisions between 1991 and 2001 that indicated the approximate number of wild horses that could be sustained in the area without interrupting the balance of the ecosystem. The population as of February 2005 was 160 (see Table 3.10-2) (Bybee, 2005). The wild horses tend to gather in the higher elevations in summer and lower elevations in winter (Bybee, 2005).

3.11 Wilderness and Areas of Critical Environmental Concern

This section describes resources comprising Wilderness and ACECs in the analysis area. As part of the analysis for the proposed White Pine Energy Station, several issues were examined in relation to these types of resource area. Four of these issues were identified to have the potential for impacts. The first issue includes a determination of conflicts that may arise because of construction-related truck traffic on existing roads used to access these resource areas. The second issue examines potential conflicts between the White Pine Energy Station alternatives and relevant federal, state, or local management plans and policies. The third issue is a determination of impacts occurring to the resource areas because of access roads that would be constructed. The fourth issue is an analysis of potential impacts on access and visitation rates to the resource areas because of the proposed Station.

The analysis involved a review of related county, state, and federal land use plans as well as other land records. The analysis area for this set of resources is a 50-mile radius around the White Pine Energy Station Proposed Action and Alternative 1 facility sites.

3.11.1 Wilderness

The Wilderness Act of 1964 established the National Wilderness Preservation System, which is comprised of public and other federal lands designated by congress as Wilderness. Wilderness is defined as an area where "….the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." Wilderness is further defined to mean "…an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed as to preserve its natural conditions." Designation is meant to ensure that the land is preserved and protected in its natural condition.

The White Pine County Conservation, Recreation and Development Act of 2006 (Public Law 109-432) was passed by Congress on December 20, 2006. This bill provides for 538,000 acres of Wilderness through the establishment of 12 new areas and the expansion of two existing areas (see Figure 3.11-1). Along with creating Wilderness, the bill allows the BLM to sell up to 45,000 acres consistent with its resource-management plan.

Within the project study area there are four Wilderness areas (see Table 3.11-1). Goshute Canyon Wilderness is located in the Cherry Creek Mountains in northern White Pine County within the project area. Goshute Canyon Wilderness comprises approximately 42,544 acres of BLM managed land. Bristlecone Wilderness is located in the Egan Range within the project area, approximately three miles west of McGill. Bristlecone Wilderness comprises approximately 14,095 acres of BLM managed land. Becky Peak Wilderness is located in the Schell Creek Range in northern White Pine County within the project area. Becky Peak comprises approximately 18,119 acres of BLM managed land. High Schells Wilderness is located in the Schell Creek Range within the project area, approximately 3 miles east of McGill. High Schells Wilderness comprises approximately 121,497 acres of USFS managed land.

3.11.2 Areas of Critical Environmental Concern

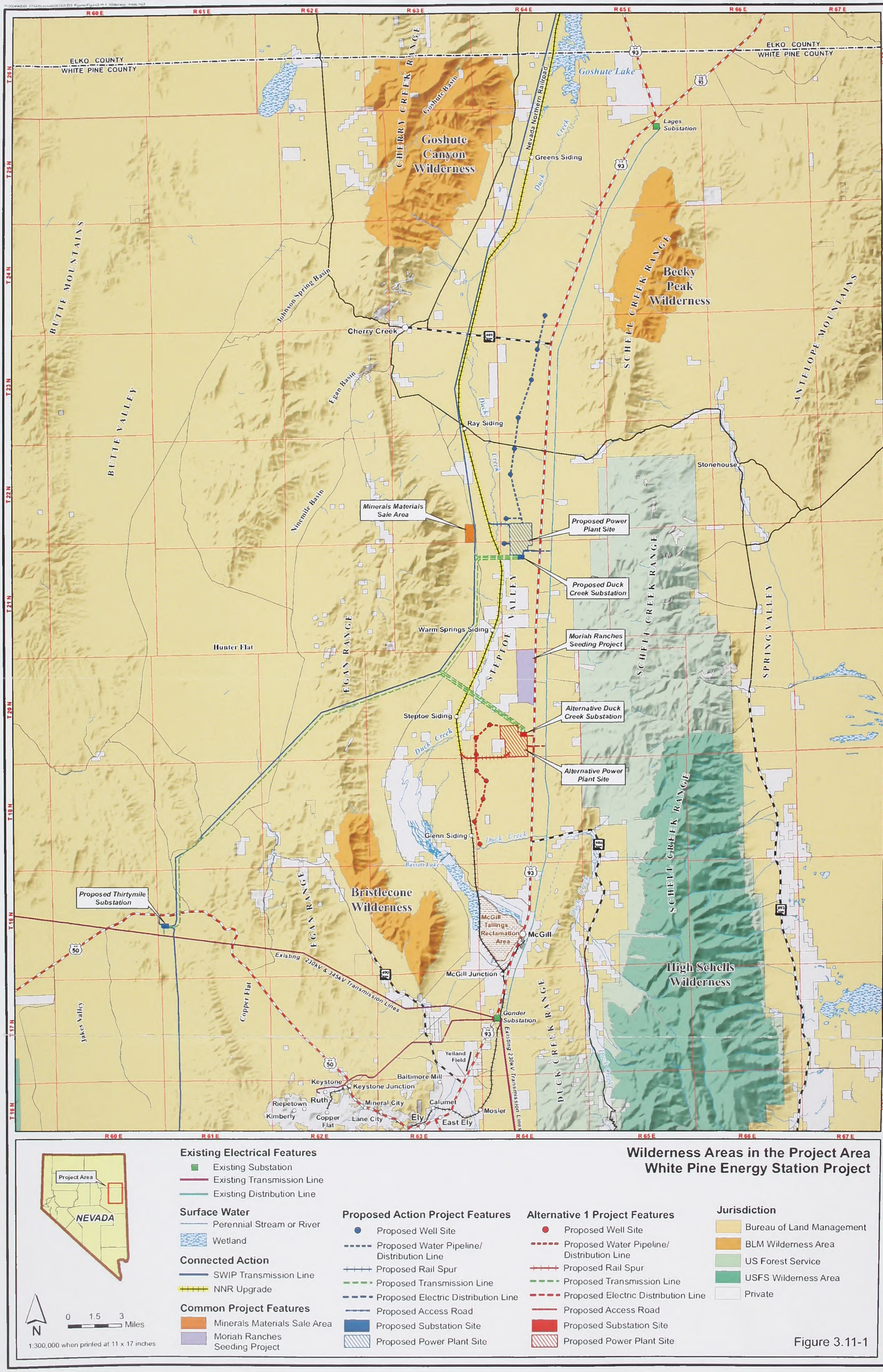
The FLPMA requires that priority be given to the designation and protection of ACECs. An ACEC designation is the principal BLM designation for public lands where special management is required to protect important natural, cultural, and scenic resources, or to identify natural hazards. No ACECs exist within 50 miles of the Station project area.

TABLE 3.11-1

Wilderness in the Project Area

Land Manager	Name	Size
BLM	Goshute Canyon	42,544 acres
BLM	Bristlecone	14,095 acres
BLM	Becky Peak	18,119 acres
USFS	High Schells	121,497 acres

Source: HR 6111; EDAW GIS 2006.



Wilderness Areas in the Project Area
White Pine Energy Station Project

Figure 3.11-1

3.12 Wastes, Hazardous and Solid

This section discusses existing wastes, both hazardous and solid, as they relate to project feature sites for the White Pine Energy Station Proposed Action and Alternative 1. Sites with known or suspected waste releases may be affected by a proposed project. Therefore, project sites were evaluated to assess environmental conditions relative to the presence of hazardous or solid wastes.

3.12.1 Existing Conditions

The proposed Station would be located entirely on BLM-administered land. This general area is very sparsely populated. Station feature sites for the Proposed Action and Alternative 1 are currently uninhabited and undeveloped. The NNR would be upgraded as part of a connected action and a new rail spur would be built to convey coal to the Proposed Action or Alternative 1 power plant. The original NNR corridor contained a small gauge railroad that was used for transporting mining products. There is low potential of hazardous materials impacts from this historic use. The transmission line ROW for the Station Proposed Action and Alternative 1 would intersect several dirt roads and cross over the Egan Range. The transmission line ROW, as well as the water supply wellfield and pipeline, would be located on BLM land. Although the existence of hazardous materials along these proposed alignments is possible, development within these areas is limited and is not expected to have generated a substantial presence of hazardous materials within the alignments. No historic solid hazardous waste sites were identified in the project area. No hazardous or solid wastes are currently generated within the proposed project feature boundaries.

3.12.2 Regulatory Framework

Use, storage, and disposal of hazardous materials are regulated by numerous local, state, and federal laws. The U.S. Department of Transportation regulates the transport of hazardous substances. Table 3.12-1 summarizes applicable regulations for hazardous materials with which the proposed Station must be in compliance. White Pine County's 2006 Solid Waste Management Plan Revision was approved by the Nevada Division of Environmental Protection (NDEP) in September 2006. White Pine County's Solid Waste Landfill Management Plan, which was approved in 2006, considers the White Pine Energy Station.

TABLE 3.12-1

Summary of Applicable Regulations and/or Administering Agencies for Hazardous Materials

Regulation and/or Administering Agency	Relevance
U.S. Department of Transportation	Regulates the transport of hazardous substances
Resource Conservation and Recovery Action (RCRA), U.S. Environmental Protection Agency (EPA), 42 USC 321 et seq.	Regulates the use and disposal of hazardous wastes
Toxic Substance Control Act, EPA, 15 USC 2601 et seq.	Regulates the production, use, sale, and other distribution of potentially hazardous chemicals including polychlorinated biphenyls (PCBs)

TABLE 3.12-1

Summary of Applicable Regulations and/or Administering Agencies for Hazardous Materials

Regulation and/or Administering Agency	Relevance
Comprehensive Environmental Response, Compensation, and Liability Act and the Superfund Amendments and Reauthorization Act, EPA, 42 USC 9601 et seq.	Provides liability requirements for contaminated sites as well as use and spill notification requirements
Emergency Planning and Community Right-to-Know Act, EPA, 42 USC 11011 et seq.	Requires certain manufacturing facilities to file annual reports with the EPA that identify their use and release of one or more listed toxic chemicals and provides for a network of state and local emergency planning committees to facilitate planning of emergency response plans
Clean Water Act, EPA, 33 USC 1251 et seq.	Enforcement of discharge limitations through the National Pollutant Discharge Elimination System (NPDES)
Clean Air Act, EPA, 42 USC 7401 et seq.	Comprises several coordinated programs that address air pollution and sources

3.13 Cultural Resources

The following discussion provides an overview of the cultural resources that have been identified and can be expected to be found associated with each of the Station components that may be directly or indirectly impacted by the Proposed Action and Alternative 1. Potential impacts are discussed in Section 4.13, *Cultural Resources.*

3.13.1 Resource Definition

A cultural resource is any defined location of past human activity, occupation, or use, identifiable through field investigation, historical documentation, or oral histories. Cultural resources include archaeological, historic, or architectural sites, structures, places, objects, and artifacts (BLM, 1999). Cultural resources in the Station project area are divided into three groups: prehistoric archaeological resources; historic archaeological and architectural resources; and Traditional Cultural Properties (TCPs). Historic properties are those historic or, prehistoric cultural resources or TCPs, which have been determined through consultation with the Nevada State Historic Preservation Office (SHPO) and advisory council to be eligible for inclusion in the National Register of Historic Places (NRHP).

3.13.2 Analysis Area and Methodology

A Cultural Resources Programmatic Agreement outlining the methods of identification and treatment was drafted and approved by LS Power Associates, the BLM Ely District, and the Nevada SHPO (March 2006) (see Appendix F, *Programmatic Agreement*). In accordance with the Programmatic Agreement, an area of potential effect (APE) was established for assessing the potential direct and indirect effects of the Station Proposed Action and Alternative 1. The APE for the assessment of direct effects consisted of all Station components associated with the Proposed Action and Alternative 1. These were described in detail in Chapter 2.

A Class III inventory was conducted within the majority of the footprint for each of the Station components, with the following exception. The proposed 500-foot-wide corridors for the 500-kV transmission line that would connect the Proposed Action and Alternative 1 Duck Creek Substation to the SWIP were subjected to a Class I level of analysis. This analysis also included a predictive model of cultural resource sensitivity within the transmission line ROWs based on the BLM cultural resource predictive model. The potential indirect visual effect of Station features on the viewshed from historic resources also was assessed.

3.13.3 Regulatory Framework

Historical and archaeological resources are managed under an intricate system of federal laws, some of which have resulted in comprehensive plans or management strategies. Those that pertain specifically to historic and archaeological resources and the Station are described in detail in Appendix G, *Cultural Resources Background Information* (see *Regulatory Framework*) and are as follows:

- Historic Sites Act of 1935 (16 USC 461-467)
- National Environmental Policy Act (NEPA) of 1969 (42 USC 4321 et seq.)
- Executive Order 11593, Cultural Resources
- American Indian Religious Freedom Act of 1978 (PL 95-341)
- Executive Order 13007, Indian Sacred Sites

- National Historic Preservation Act of 1966 (16 USC 470 et seq.)

3.13.4 Criteria for Significance

Decisions regarding the management of cultural resources, including TCPs, hinge on determinations of their NRHP significance.

To determine significance, the National Park Service has identified components that must be considered in the evaluation process. These include criteria for determining eligibility, historic context, and integrity.

Significance of cultural resources is measured against the following NRHP criteria for evaluation (36 CFR 60.4):

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and,
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or
>
> (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) that has yielded, or may be likely to yield, information important in prehistory or history.

A more detailed explanation of each criterion and each component that must be considered in the cultural resource evaluation process is presented in Appendix G, *Cultural Resources Background Information* (see *Criteria for Significance*).

3.13.5 Affected Environment Setting

3.13.5.1 Natural Setting

A summary of the natural setting for the Station project area can be found in Appendix G, *Cultural Resources Background Information* (see Affected Environment, Natural Setting).

3.13.5.2 Cultural Setting

The Station project area and its vicinity are known to contain numerous traces of past human activity ranging from early Native American sites and artifacts, to the remains of early trails and transportation routes, historic-era mining, and ranching activities. Such materials can be found at many locations on the landscape and represent the traces of human activities that in some cases extend as far back as 10,000 to 12,000 years before the present. A detailed discussion of the Station area's prehistoric, ethnographic, and historic setting can be found in Appendix G, *Cultural Resources Background Information (see Cultural Setting)* and provides context for the following discussion of cultural resources identified within the APE.

3.13.6 Resources Identified Within the Area of Potential Effect

A series of technical studies (EDAW, 2006a and 2006b) identified several historic properties within the APE for the Proposed Action and Alternative 1. With the exception of the ROWs for the 500-kV transmission line linking the proposed locations of the Duck Creek Substation at the power plant sites, all areas that may be directly impacted by implementation of the

Proposed Action or Alternative 1 were subjected to an intense Class III inventory. A Class I inventory, consisting of a review of previous studies and application of the BLM cultural sensitivity model, was used to assess the cultural sensitivity of the 500-kV transmission line ROWs.

In coordination with the BLM, a significant viewshed was established for the assessment of indirect visual effects. An assessment of NRHP eligibility was conducted for 16 ranches whose eligibility may be compromised by the implementation of the Proposed Action or Alternative 1.

3.13.6.1 Class III Inventory

Class III inventories conducted by the BLM and EDAW resulted in the documentation of 37 cultural resource sites within the Proposed Action and Alternative 1 project areas (EDAW, 2006a). Of these, the majority are prehistoric resources (24), and the remainder (13) are the result of land use during the historic era. A total of 10 resources (5 prehistoric and 5 historic), or 27 percent of the total identified resources, have been recommended eligible for inclusion in the NRHP, pending determinations by the BLM and review by the Nevada SHPO. All significant prehistoric sites have been recommended NRHP eligible based upon their research potential, Criterion A. Of the five historic resources, one is a portion of the Pony Express National Historic Trail/Overland Stage, one is an historic homestead with evidence for the presence of subsurface archaeological deposits, one is the route of the Transcontinental Telegraph, and the remaining two are represented by documented segments of the NNR. While the Pony Express National Historic Trail has been determined eligible under Criteria A, B, and C described previously, that segment within the Proposed Action project area has been impacted by construction of County Road 18 and is recommended not eligible under Criterion C. The route was also recommended as eligible to the NRHP under Criterion A for its association with the Overland Stage. Both segments of the NNR have been recommended eligible under Criterion C, and one segment also appears eligible under Criterion D. The homestead was recommended eligible under Criterion D, based upon evidence for the presence of subsurface archaeological deposits. Table 3.13-1 summarizes these resources by Station project area.

3.13.6.2 Class I Inventory

Results of the Class I inventory and application of the BLM sensitivity model for cultural resources (Drews and Ingbar, 2004) indicate a strong potential for the presence of significant archaeological sites within the proposed 500-kV ROWs for the transmission lines linking the Proposed Action and Alternative 1 power plants to the SWIP corridor. Also, both transmission line ROWs would bisect the NNR, for which the NRHP evaluation has yet to be completed.

TABLE 3.13-1
Summary of Identified Cultural Resources by Station Project Area

	Proposed Action		Alternative 1		Thirtymile Substation		Total	
	Total	Recommended NRHP-Eligible	Total	Recommended NRHP-Eligible	Total	Recommended NRHP-Eligible	Total	Recommended NRHP-Eligible
Prehistoric	4	0	8	2	12	3	24	5
Historic	9	3*	4	2	0	0	13	5
Total	13	3	12	4	12	3	37	10

* Includes the Pony Express National Historic Trail.

3.13.6.3 Historic Ranches

Sixteen historic ranches within the viewshed of the Proposed Action and/or Alternative 1 power plant sites and the proposed transmission lines were assessed for eligibility to the NRHP under Criteria A, B, and C (EDAW, 2006b). Access was not available for the Pescio and Fitzhugh Ranches, consequently an assessment of NRHP eligibility could not be completed. Both of these resources are assumed eligible pending completion of the NRHP assessment. Of the remaining fourteen ranches, the Schellbourne Ranch is listed on the NRHP and five other ranches were found to possess elements that have been recommended eligible under one or more of the three criteria. These five ranches are briefly described below.

3.13.6.3.1 Kemp Ranch

The dugouts on this property stand as reminders of the rural culture developed in response to the mining boom in the early 1900s, and therefore appear eligible under Criterion A of the NRHP. Research did not indicate that the original owners, the Mollesons, were considered important in local history (NRHP Criterion B) The slaughterhouse structure is a good example of early 20th century slaughterhouses and has retained a good degree of integrity of design, workmanship, and historic structures. Therefore, it is recommended NRHP-eligible under Criterion C.

3.13.6.3.2 Mattier Creek Ranch

Similar to the Kemp Ranch, historic documentation did not reveal a relationship between significant historic events or persons that would qualify the Mattier Creek Ranch NRHP-eligible under Criteria A or B. However, the original stone homestead appears NRHP-eligible under Criterion C. This building is an excellent example of architectural characteristics and methods of construction used in the region during the early homestead era. In addition, it has retained its integrity of location, materials, workmanship, and design.

3.13.6.3.3 Magnuson Ranch

While not eligible under Criteria B and C, the residence (constructed around 1915) at Magnuson Ranch is recommended NRHP-eligible for its association with the original Lincoln Highway. Although additions and modifications have been made to the structure and other ranch buildings have been added to the complex, the residence retains its direct association with the Lincoln Highway and the surrounding rural landscape of Steptoe Valley that is virtually unchanged since the early 1900s, the period of significance.

3.13.6.3.4 Monte Neva Hot Springs Resort

The integrity of the Monte Neva Hot Springs Resort has been severely compromised through demolition and deterioration. Historic documentation failed to reveal an association with persons of importance during the historic era (Criterion B). However, the adobe building on this property appears to be eligible for listing on the NRHP for its association with the Monte Neva Hot Springs Resort, a regional manifestation of the recreational/health movement of the late nineteenth/early twentieth century (Criterion A), and as a good example of a rare vernacular building type (Criterion C). The property as a whole has lost a significant amount of integrity because of the removal of almost all of the original buildings and structures. Most of what is known about this property is revealed through a relatively small number of surviving primary sources. Because of this property's significant association with an important historic theme, and because of the scarcity of surviving documentation concerning its history, any archaeological remains at this property would be likely to yield important primary information (Criterion D). The Monte Neva property, therefore, appears eligible for NRHP listing as a historic site for its archaeological information potential.

3.13.6.3.5 Schellbourne Ranch

The Schellbourne Ranch was previously evaluated and determined eligible for listing on the NRHP. Scant information contained in the nomination form lacks a discussion of the significant historic values represented at the ranch. However, the association with the Pony Express, Overland Stage, early mining, and as a stop on the original 1913 route of the Lincoln Highway appears to qualify the property under Criterion A. The potential for archaeological values associated with each of these events and the location of a Shoshoni village qualifies the ranch for archaeological values and as NRHP-eligible under Criterion D.

3.13.6.3.6 Whiteman Creek Ranch

The buildings that remain on this property, a cabin and dugout/cellar, appear to have been constructed sometime during the early twentieth century. This was a time of renewed agricultural development in the Steptoe Valley, brought about by the discovery of great copper deposits in the area. These buildings reflect an association to that period in time, and therefore appear eligible under NRHP Criterion A.

Research did not reveal that the property was associated with individuals considered important in local history (NRHP Criterion B). The buildings themselves do not embody distinctive architectural characteristics, nor do they represent noteworthy examples of local vernacular architecture (NRHP Criterion C). These types of buildings are well recorded in both written and visual sources, and do not appear likely to yield important primary information concerning historic construction techniques or technology (NRHP Criterion D).

3.13.6.4 Historic Linear Resources

Three historic linear resources are located within the viewshed of the Station Proposed Action and Alternative 1. While the entire route of the Pony Express National Historic Trail has been determined NRHP-eligible under Criteria A and B, the route of the NNR from Ely to Cobre and the section of the Lincoln Highway within Steptoe Valley have yet to be evaluated.

3.13.6.4.1 Nevada Northern Railroad (NNR)

Forty acres containing the NNR Station, maintenance buildings, and associated rolling stock located in Ely are listed on the NRHP and has also been designated a National Historic Landmark. Two segments of the NNR within Steptoe Valley were assessed for NRHP-eligibility under Criteria C and D (EDAW, 2006a). One segment was recommended eligible under Criterion D and both segments were recommended as contributing elements under Criterion C. No eligibility assessments have been made for the rail line from Ely to Cobre, however two other short segments of the rail line within Steptoe Valley have been recommended as contributing elements under Criterion C. While not formerly evaluated under Criteria A and B, the entire route of the NNR appears eligible under Criterion A for its contribution to the economic development of the Ely region, and under Criterion B for its association with Mark Requa who was instrumental in developing the copper mining operations of the region.

3.13.6.4.2 Pony Express National Historic Trail

Godfrey (1994) states that the significance of the Pony Express "does not rest on the company's capabilities as a viable and efficient economic endeavor. Instead, its significance is grounded in the Pony Express' basic contribution to transportation and communication history, and its very existence during a critical time period in American history." For these reasons the route has been determined eligible to the NRHP under Criterion A. For similar reasons it can also be argued that the route would not have existed if it were not for the efforts of the primary owner of the COC & PP Express Co, William Russell, qualifying the Pony Express route for eligibility under Criterion B. Elsewhere, where the remains of stations exist, the associated features have been determined eligible under Criterion C.

Regarding those segments within the Station project area, lack of integrity, architectural or engineered features, or evidence for the presence of archaeological deposits precludes those segments from qualifying as a contributing element under Criteria C or D. Therefore, while the route as a whole is eligible under Criterion A and possibly B, and elsewhere outside the limits of the Station project area, stations have been determined eligible under Criterion C, those portions within the Station project area (see Figure 3.8-1) have been recommended as a non-contributing segments under Criterion C and D (see EDAW, 2006a).

NPS (Goddfrey, 1994) lists the Pony Express route from the Nevada-Utah border to just east of Austin, including the route within Steptoe Valley, as a high potential route, which is defined as "those segments of a trail which would afford a high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route."

3.13.6.4.3 Lincoln Highway

Several components, including road segments and associated features, are listed on the NRHP elsewhere. Other constituents of the Lincoln Highway in Nevada have been recommended and determined eligible for inclusion in the NRHP, however none are currently listed. Evaluations have not been conducted on the segment in Steptoe Valley that is east and parallel to U.S. 93.

Within Steptoe Valley, the National Park Service (2004) has designated the route of the 1913 Lincoln Highway as a Heritage Area. Magnuson Ranch, a rest stop noted in the Lincoln Highway tour books, is located on the original 1913 portion of the route, and the Magnuson Ranch residence constructed around 1913 appears eligible to the NRHP under Criterion A (see discussion above). Schellbourne Ranch, another stop along the original route, is listed on the NRHP under Criteria A and D.

3.13.6.5 Traditional Cultural Properties

No Traditional Cultural Properties were identified in a recent Ethnographic study for the Ely Resource Management Plan (Woods, 2003), or during further consultation with the BLM, Ely Field Office.

3.14 Environmental Justice

Executive Order 12898, *Environmental Justice*, requires federal agencies to disclose if actions will result in a disproportionate concentration of impacts on minority or low-income populations.

3.14.1 Study Area

The study area for environmental justice is primarily within White Pine County, Nevada. However, effects concerning air quality could extend beyond White Pine County into counties to the north and east in both Nevada and Utah.

3.14.2 Populations

Executive Order 12898 addresses any identified minority populations or low-income populations likely to be adversely affected by the construction, operation, and maintenance of a project. A population is all people living in a given geographic area or a group of people from whom a statistical sample is taken. With respect to environmental justice, the population is all people who are members of a minority group or living in a low-income household.

Affected populations would be in three census tracts: 9701 (includes McGill), 9702 (includes Ely and Ruth), and 9703 (includes Ely, Keystone Junction, and Baltimore Mill). Census Tract 9701 averages less than 1 person per square mile and is the sparsest census tract in White Pine County. The densest census tract is 9703 with an average of 62 people per square mile.

The White Pine Energy Station Proposed Action and Alternative 1 power plant sites are located in a sparsely populated area of Census Tract 9701. The Proposed Action and Alternative 1 sites are 22 miles and 10 miles, respectively, from communities of any discernable density. All segments of the associated transmission line would pass through unpopulated or sparsely populated areas of White Pine County. None of the segments would pass near any known minority populations or low-income populations. The community with the largest population in Census Tract 9701 is McGill, with 1,054 residents in approximately 1 square mile. This is approximately half of the census tract's population. The remaining 1,718 residents are dispersed among the census tract's remaining 6,460 square miles (Rajala, 2005).

The closest residential structures are approximately 2 miles from the Station Proposed Action and Alternative 1 power plant sites. An interview with White Pine Economic Diversification Council staff indicates that none of the households closest to either site contain protected populations.

3.14.2.1 Low-Income Populations

The population of low-income people in the study area is identified through the annual statistical poverty thresholds from Bureau of the Census's *Current Population Reports, Series P-60 on Income and Poverty*. These thresholds are the same as those used by the U.S. Department of Health and Human Services. Low-income populations, when regarded as communities, may be characterized by geographic proximity or commonly experienced environmental conditions.

Table 3.14-1 presents the most recent update of the poverty thresholds (2004).

Table 3.14-2 presents the poverty statistics for White Pine County's three census tracts and the state of Nevada.

TABLE 3.14-1

Poverty Thresholds Annual Income ($) for 2004 by Size of Family and Number of Related Children Under 18 Years

	Related Children Under 18 Years								
Size of Family Unit	None	One	Two	Three	Four	Five	Six	Seven	Eight or More
One person (unrelated individual)									
Under 65 years	9,827								
65 years and over	9,060								
Two people									
Householder under 65 years	12,649	13,020							
Householder 65 years and over	11,418	12,971							
Three people	14,776	15,205	15,219						
Four people	19,484	19,803	19,157	19,223					
Five people	23,497	23,838	23,108	22,543	22,199				
Six people	27,025	27,133	26,573	26,037	25,241	24,768			
Seven people	31,096	31,290	30,621	30,154	29,285	28,271	27,159		
Eight people	34,778	35,086	34,454	33,901	33,115	32,119	31,082	30,818	
Nine or more people	41,836	42,039	41,480	41,010	40,240	39,179	38,220	37,983	36,520

Source: U.S. Census Bureau, 2004

TABLE 3.14-2

Income Levels of Individuals Surveyed in Nevada and Project Area Census Tracts

		Census Tract		
	Nevada	9701	9702	9703
Individuals below poverty level in 1999	205,685	241	406	219
Individuals at or above poverty level in 1999	1,757,263	1,457	3,701	1,869
Percent below poverty level in 1999	10.5	14.2	9.9	10.5
Total	**1,962,948**	**1,698**	**4,107**	**2,088**

Source: U.S. Census Bureau, 2000

The number of low-income households surveyed in White Pine County is 838 (25.5 percent of the county's households). The number of individuals surveyed that are living in low-income households in the three census tracts is 866. Of the 866 people, 265 live in either small communities of less than 1,000 or in areas where no other residences exist within several miles. Census Tract 9701 (the location of the Proposed Action and Alternative 1 power plant sites) has the highest percentage of low-income people and the smallest total population in White Pine County. Of the 241 low-income people surveyed in Census Tract 9701, 112 live in McGill. Ely is home to 489 low-income people.

3.14.2.2 Minority Populations

A member of a minority population is a person or people identified as Hispanic (irrespective of racial category) or a person or people from any racial category except "white alone."

The 2000 census placed the total population of White Pine County at 9,181. The number of people in White Pine County identified as "white alone" was 7,295, or 79 percent of the total population. Census Tract 9701 had the greatest minority percentage, 27 percent, and the greatest number of minorities, 748. Census Tract 9701 had the smallest total population in White Pine County. Of Census Tract 9701's 748 minorities, 111 lived in McGill. The remaining 637 were spread throughout the census tract and within small concentrated communities. The remaining 1,138 minorities in White Pine County are mostly concentrated in Ely and small communities south of the Proposed Action and Alternative 1 power plant sites and their associated facilities (see Table 3.14-3).

TABLE 3.14-3
Minority Population in Nevada and Project Area*

		Census Tract		
	Nevada	**9701**	**9702**	**9703**
Hispanic or Latino	393,970	328	381	299
Not Hispanic or Latino	1,604,287	2,444	3,947	1,782
Population of one race	1,555,056	2,415	3,878	1,748
White alone	1,303,001	2,024	3,606	1,665
Black or African American alone	131,509	306	59	5
American Indian and Alaska Native alone	21,397	64	161	49
Asian alone	88,593	14	34	23
Native Hawaiian and Other Pacific Islander alone	7,769	4	13	4
Some other race alone	2,787	3	5	2
Population of two or more races	49,231	29	69	34
Percent minority	35	27	17	20
Total	**1,998,257**	**2,772**	**4,328**	**2,081**

Source: U.S. Census Bureau, 2000

*The difference in population totals between Table 3.14-2 and Table 3.14-3 is due to the survey method used in the 2000 census. Table 3.14-2 is based on a sample survey and Table 3.14-3 is based on a 100 percent survey.

3.14.3 Public Participation by Low-Income and Minority Populations

Proactive efforts were taken to ensure meaningful participation from minority populations and low-income populations. Two scoping meetings were conducted using an open-house format:

- August 23, 2004, Ely, Nevada
- August 24, 2004, Reno, Nevada

The meetings were publicized through newspaper advertisements and individual mailings. On August 13 and August 20, 2004, advertisements were published in the *Ely Times* (White Pine County) and the *Reno Gazette-Journal* (Washoe County). Both publications are newspapers of general circulation within their respective counties. Mailings were sent to 210 addresses. Project and BLM representatives presented project information on display boards and handouts, and discussed concerns with attending individuals at each meeting.

See Chapter 5, *Consultation and Coordination* for a complete description of public involvement efforts.

3.15 Native American Religious Concerns

An integral part of the NEPA scoping process includes coordination between federal agencies and those groups who may be affected by a proposed federal action. BLM representatives initiated formal and informal communication with Native American Tribal representatives in the project area to discuss the proposed project. This process has provided Tribes with the opportunity to identify potential effects of the project on Native American interests.

This section describes Native American Religious Concerns in the project area. Section 3.15.1, *Analysis Area and Methodology*, includes a brief description of the analysis area and methods. Section 3.15.2, *Regulatory Framework,* describes legal acts and Executive Orders that protect Native American cultural resources, rights, and values.

3.15.1 Analysis Area and Methodology

The analysis area for Native American Religious Concerns includes lands identified within the designated Station project area proposed for the following:

- Power plant sites
- Electrical substations
- Electric transmission lines (300 feet from each side of the centerline)
- A 200-foot-wide corridor that extends 100 feet from the centerline of other linear features (water pipelines, railway spur, and access roads)
- Up to 5-acre parcels for wells, pump stations, and water storage facilities

The methodology for the analysis of Native American concerns included a review of correspondence and meetings with Tribal representatives to discuss the scope of the proposed project and any issues or concerns that Tribal representatives might have regarding the project.

A Native American coordination meeting was conducted on December 8, 2004, in the BLM Ely Field Office with representatives from the Ely Shoshone Tribe, Duckwater Shoshone Tribe, WPEA, and the Ely Field Office staff. WPEA representatives presented project details to the group. Issues and concerns were discussed.

After the December 2004 meeting, BLM Ely Field Office staff have remained in communication with the Tribes regarding the project. The most recent meeting with the Tribes was in July 2006. Another meeting with the Tribes is anticipated to coincide with the release of this DEIS to the public for review and comment. However, at this point in the project, no issues or concerns have been raised by the various Tribes regarding any religious or traditional cultural property concerns.

3.15.2 Regulatory Framework

The following text describes legal acts and Executive Orders followed by the BLM in their relationships with Tribal governments that protect Native American cultural resources, rights, and values.

3.15.2.1 National Historic Preservation Act, as Amended for Protection of Native American Values

As discussed in Section 3.13, *Cultural and Historical Resources,* Section 106 of the National Historic Preservation Act requires federal agencies to take into account effects of their undertaking on properties eligible to the NRHP. Amendments of 1992 provide explicitly for consideration of places of traditional religious or cultural significance as eligible to the National Register. Such places, referred to as "traditional cultural properties," require different considerations from archaeological sites and historic buildings (National Park Service, 1999) when evaluating their significance against National Register criteria. The 1992 amendments also direct federal agencies to consult with appropriate Tribes as part of their Section 106 process. Such consultation enables Tribal governments and traditional elders to assist in identifying potentially eligible properties and the values that make them eligible; and assessing project effects on such properties, including identification of mitigation measures where possible.

3.15.2.2 Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act of 1990, as amended (Federal Register 62:148), requires consultation with appropriate Indian Tribes prior to the excavation of human remains, funerary objects, sacred objects, or objects of cultural patrimony on federal lands. The Native American Graves Protection and Repatriation Act recognizes Native American ownership interests in some human remains and cultural items on federal lands and makes illegal (under most circumstances) the sale or purchase of Native American human remains, whether or not they are derived from federal or Indian lands. Repatriations, on request, to the culturally affiliated Tribe are required for human remains and associated funerary objects. Repatriation of other cultural items depends on whether or not the original acquisition of an item was from an individual with the authority to alienate from the Tribal group (43 CFR Par 10).

3.15.2.3 American Indian Religious Freedom Act of 1978

The American Indian Religious Freedom Act of 1978 affirms United States policy that federal agencies will ensure that their policies and procedures protect and preserve the rights of American Indians to affirm, express, and exercise traditional religions, including access to sites, use and possession of sacred objects, and freedom of worship through ceremonials and traditional rites. The law required a review of policies by federal agencies when it was passed. However, it contains no enforcement provisions or sanctions for policies or procedures that do not comply with the overall policy.

3.15.2.4 Executive Order 13007 of 1996, "Indian Sacred Sites"

Executive Order 13007 adds an element of enforcement to the policy set forth by the American Indian Religious Freedom Act of 1978. It requires the following actions from federal agencies

- Accommodate access to and ceremonial use of sacred sites by Indian religious practitioners
- Avoid adverse physical effects to such sites

Agencies must provide reasonable notice of proposed actions that might "restrict further access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites." Tribes must inform agencies of the existence of such sites.

3.15.2.5 Memorandum on Government-to-Government Relations with Native American Tribal Governments of 1994

This memorandum outlines principals that executive departments and agencies are to follow within a government-to-government relationship with federally recognized Tribes.

3.15.2.6 Title I of the Indian Self-Determination and Educational Assistance Act of 1975

Title I of this Act provides direct and primary authority to Tribal governments to contract programs and services that are carried out by the federal government under specific authorities or which are for the benefit of Indians because of their status as Indians, and also provides some limited authority for Tribal governments to acquire lands adjacent to reservations for purposes of the Act.

3.15.2.7 Archaeological Resources Protection Act of 1979

This Act provides for the notification of appropriate Indian Tribes, and subsequent consultation, prior to issuance of any permit that might harm sites of cultural or religious importance to the Tribe(s).

3.15.2.8 Title IV of the Indian Self-Determination and Educational Assistance Act of 1994: The Self-Governance Act

This Title provides that certain programs, functions, services and activities or portions thereof are eligible to be planned, conducted, consolidated, and administered by a self-governance Tribal government. Title IV expands contracting beyond programs that are for the benefit of Indians by providing for discretionary compacting of "nexus" programs administered by the Secretary of the Interior where there is a special geographic, historic, or cultural significance to participating Tribes.

3.15.2.9 Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This order supercedes the previous Executive Order 13084 of the same title. Executive Order 13175 provides fundamental principles for agencies to follow when formatting or implementing "policies that have Tribal implications," referring to regulations, proposed legislation, other policy statements, or actions that have substantial direct effects on Tribes, or on the distribution of power and responsibilities between the Federal Government and Indian Tribes.

3.15.2.10 512 DM 2.1, Departmental Responsibilities for Indian Trust Resources

This directive establishes policies, responsibilities, and procedures for operating on a government-to-government basis with federally recognized Indian Tribes for the identification, conservation, and protection of American Indian and Alaska Native trust resources to ensure the fulfillment of the Federal Indian Trust Responsibility. Agencies must identify impacts from federal plans, projects, programs, or activities on Indian trust resources and must address such impacts in planning, decision, or operational documents and consult with Tribal governments whose assets are potentially affected.

3.15.2.11 512 DM 3, Sacred Sites

This directive establishes policy, responsibilities, and procedures to accommodate access to and ceremonial use of Indian sacred sites and to protect the physical integrity of such sites consistent with Executive Order 13007.

3.16 Paleontological Resources

Paleontological resources are fossilized remains of multi-cellular invertebrate and vertebrate animals and multi-cellular plants, including imprints (36 CFR 261.2). Section 3.16.1, *Analysis Area and Methodology*, includes a brief description of the analysis area and methods. Section 3.16.2, *Regulatory Framework*, describes federal regulations that protect paleontological resources. Section 3.16.3, *Existing Conditions*, describes the existing paleontological resource conditions in the project area.

3.16.1 Analysis Area and Methodology

The analysis area for paleontological resources includes lands identified within the designated Proposed Action and Alternative 1 Station areas proposed for:

- Power plant sites
- Electrical substations
- Electric transmission lines (300 feet from each side of the centerline)
- A 200-foot-wide corridor that extends 100 feet from the centerline of other linear features (water pipelines, railway spur, and access roads)
- Up to 5-acre parcels for wells, pump stations, and water storage facilities

Existing literature on the geology and paleontological resources of the project area was reviewed for the existence of known fossils or areas with high potential for the existence of fossils based on geologic conditions. No field surveys were conducted for this project.

3.16.2 Regulatory Framework

3.16.2.1 Code of Federal Regulations

The BLM manages paleontological resources under a number of federal regulations. Sited most often is 43 CFR 8365.1-5, which prohibits the willful disturbance, removal, and destruction of scientific resources or natural objects. Regulations at 43 CFR 8360.0-7 identify the penalties for such violations.

3.16.2.2 Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) of 1976 (P.L. 94-579) requires that public lands be managed in a manner that protects the "...scientific qualities..." and other values of resources under BLM management.

The BLM has a Paleontological Resource Management Program intended to provide a consistent and comprehensive approach to the management of paleontological resources, including identification, evaluation, protection, and use. This program is described in BLM Manual 8720 (BLM, 1998). The specific objectives of this program are included in Appendix A, *Best Management Practices*, under Paleontological Resources.

Paleontological resources found on public lands are recognized by the BLM as constituting a fragile and nonrenewable scientific record of the history of life on earth, and so represent an important and critical component of America's natural heritage. It is the BLM's policy, therefore, to manage paleontological resources for these values, and to mitigate adverse impacts to them (BLM, 1998).

3.16.3 Existing Conditions

The most recent, county-wide paleontological research in White Pine County was completed and presented in the *Final Environmental Impact Statement for the Proposed White Pine Power Project* completed for the BLM by Dames and Moore (1984). The following existing condition information relies heavily on this source, which represents the most recent information available.

The earliest geological evidence in White Pine County is the late Precambrian McCoy Creek Group of quartzites and schists found in the Cherry Creek, Egan, Schell, and Snake Ranges. 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 White Pine 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 White Pine County and account for most localities recorded.

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 sediments 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.

3.16.3.1 Paleontological Resources Literature Survey Results

Steptoe Valley sediments are mapped as Quaternary alluvium and playa deposits. A review of the literature did not reveal any recorded fossil locations within the project area, except for the transmission line ROW. Few reports of fossils were found in the literature review.

3.17 Socioeconomics

This section describes existing socioeconomic conditions in White Pine County, Nevada. White Pine County was selected as the primary study area for socioeconomic resources because the proposed White Pine Energy Station and ancillary facilities would be located entirely within the county, and the Station construction and operations workforce would be based in the local area. Therefore, the potential socioeconomic effects resulting from implementation of the Proposed Action or Alternative 1 would likely be concentrated in White Pine County. In some cases, socioeconomic effects would also take place in surrounding counties and/or other regions of the country, depending on the location of direct construction- and operations-related expenditures or indirectly as direct effects ripple through the economy (the multiplier effect).

The focus of this section is on those socioeconomic resources that may be affected by the Proposed Action or Alternative 1. The key resource topics addressed in this section include: population and housing, including property values; local economic conditions (as measured primarily by employment and income); fiscal resources of local government agencies; and local public services.

The purpose of the Affected Environment section is twofold. The information presented is intended to provide context and a general overview of the local economy and other socioeconomic resources that would be affected by the Station. This section also establishes baseline socioeconomic conditions against which the potential impacts of the Proposed Action and Alternative 1 will be evaluated. The data used to establish baseline socioeconomic conditions come from a variety of federal, state, and local sources. County-level information, particularly data from the *2006 Comprehensive Economic Development Strategy* (CEDS) prepared by the White Pine County Economic Diversification Council (WPCEDC, 2006), is included where appropriate and is considered the most accurate summary of existing local conditions, including data that reflect the recent re-opening of the Robinson Mine in 2004.

Historically, White Pine County's economy has depended on mining and agriculture, supplemented by tourism and recreation. The Robinson Copper Mine, located 7 miles west of Ely, provided the county's primary employment opportunities and economic activity from 1906 through the 1970s. In 1978, Kennecott Copper closed the mine, causing a severe economic decline. In 1996, the mine was sold to Magma Copper of Arizona and later to BHP of Australia. The mine operated until 1999, and when it closed the second time, it again caused a significant economic decline. The boom/bust cycle of the mining industry created wide fluctuations in population, labor force, and business activity and public revenues. The mine was purchased by Quadra Mining Company in April 2004 and went back into full operation in July of that year. Washington Group Nevada (a wholly-owned subsidiary of Quadra Mining) currently performs contract mining operations. In 2005, the mine produced 126 million pounds of copper and 85,000 ounces of gold, and in 2006, production was projected to decrease slightly to 115 million pounds of copper and 55,000-60,000 ounces of gold (Quadra Mining Ltd., 2005a). According to the 2006 CEDS report, the mine reached full operation within a year of initial operations and has a workforce of 500 employees. The combined employment of the Robinson Nevada Mining Company and Washington Group Nevada makes the Robinson Mine the largest private employer in White Pine County.

3.17.1 Population

White Pine County is rural and sparsely populated. Much of the county's population is centered in the City of Ely. According to the Nevada State Demographer's Office, the total population in White Pine County in 2006 was 9,542 people (see Table 3.17-1).

The existing county population accounts for 0.4 percent of the state's total population of just over 2.6 million people, which makes it the 10th most populated of the state's 17 counties. The county's total population declined slightly between 1990 and 2000 (minus 0.9 percent); however, this trend was more prominent for the 20- to 34-year-old age group where population decreased by roughly 14.4 percent (University of Nevada, Reno, 2004). There was a decline in total population in the early 2000s partly because of the closure of Robinson Mine, but population levels recovered by 2005. More recently, population trends show an expanding population base with an increase of 2.9 percent new residents between 2005 and 2006. This is primarily a result of the re-opening of the Robinson Mine, as well as an increased demand for retirement and second homes, particularly from people residing in the Las Vegas area. Recent population increases make White Pine County the eighth fastest growing county in the state on a percentage basis.

The City of Ely, the only incorporated city in the county, had a population of 4,325 in 2006, where approximately 45 percent of the county's population resides. The City of Ely experienced declining population levels between 1990 and 2005 and recent increases in population since then. The county's other population centers include the small, rural communities of McGill, Ruth, Lund, and Baker.

Fluctuations in local population levels illustrate the influence of a relatively cyclical industry (mining), and its strong influence on the rural counties of Nevada. Such fluctuations are not evident at the state-wide level, where statistics are dominated by the state's urban centers and where population has more than doubled between 1990 and 2006 (Table 3.17-1).

TABLE 3.17-1
Historic and Current Population Levels*

Area	1990	2000	2005	2006
White Pine County	9,264	9,181 (-0.9%)	9,275 (1.0%)	9,542 (2.9%)
City of Ely	4,756	4,041 (-15.0%)	4,166 (3.1%)	4,325 (3.8%)
State of Nevada	1,201,833	1,998,257 (66.3%)	2,518,869 (26.1%)	2,622,753 (4.1%)

Source: U.S. Census Bureau 1990a, 1990b, 2000a, 200b; Nevada State Demographer's Office 2004a, 2005, 2006

* Percentage increases are shown in parentheses and represent total percentage change from previous period.

The Nevada State Demographer's Office projects that the population in White Pine County will decrease over the next two decades (see Table 3.17-2). By 2026, the total county population is expected to fall to just under 8,600 people, representing a decline of 7.4 percent between 2005 and 2026. During this same period, high growth rates are expected at the state level with the population projected to increase by nearly 74 percent. However, it should be noted that these projections rely on historic population trends, which do not fully account for recent increases in local population levels attributed to changes in the local economy, such as the re-opening of the Robinson Mine, which is drawing people into the county and expanding its population base. These projections also do not consider potential future economic developments in the Station project area or a continuation of the recent trend of retirees moving to the county. As a result, these county-level population projections may not be an accurate gauge of future population trends.

3.17.2 Employment and Job Base

Generally, the economy in White Pine County is evolving from a mining-reliant economy to a service sector economy that is becoming more dependent on tourism, retirement, and government employment. According to the U.S. Department of Commerce, Bureau of Economic Analysis, total full- and part-time employment in White Pine County in 2004 was 4,403 (Bureau of Economic Analysis, 2004a). Table 3.17-3 shows employment by type of industry in 2004. Non-farm employment is the predominant source of the county job base, accounting for 96 percent of all jobs. Overall, the largest sector in the county is Government, which employs 1,463 people and accounts for about 33 percent of the county job base. Approximately 1,000 public sector (government) jobs are with state and federal agencies and are independent of changes in the local economy (WPCEDC, 2006). Other leading sectors in the local economy in 2004 included Accommodation and Food Services (12.0 percent) and Retail Trade (11.4 percent).

In 2006, public employment still represented the largest employment sector (1,474 jobs) and mining employment had increased to 618 jobs (WPCEDC, 2006). Service-related industries, with a current employment base of 1,379 jobs in 2006, have experienced the greatest job growth in the county in recent years. The total number of non-farm private businesses in the county in 2006 was 193 (WPCEDC, 2006).

TABLE 3.17-2

Population Projections through 2026*

Area	2005	2010	2020	2026
White Pine County	9,275	9,217 (-0.6%)	9,149 (-0.7%)	8,592 (-6.1%)
State of Nevada	2,518,869	3,087,428 (22.6%)	4,001,520 (29.6%)	4,370,521 (9.2%)

Source: Nevada State Demographer's Office, 2006
* Percentage increases are shown in parentheses and represent total percentage change from previous period.

TABLE 3.17-3

Employment by Industry in White Pine County (2004)

Industry/Sector*	Jobs	% of Total
Farm Employment	179	4.1
Non-Farm Employment	4,224	95.9
Forestry, fishing, related activities and other	(D)	--
Mining	335	7.6
Utilities	(D)	--
Construction	250	5.7
Manufacturing	51	1.2
Wholesale trade	58	1.3
Retail trade	502	11.4
Transportation and warehousing	(D)	--
Information	37	0.8
Finance and insurance	95	2.2
Real estate and rental and leasing	100	2.3
Professional and technical services	(D)	--
Management of companies and enterprises	(D)	--
Administrative and waste services	139	3.2
Educational services	(D)	--
Health care and social assistance	(D)	--
Arts, entertainment, and recreation	43	1.0
Accommodation and food services	529	12.0
Other services, except public administration	145	3.3
Government	1,463	33.2
Federal (including military)	220	5.0
State	562	12.8
Local	681	15.5
Total	**4,403**	**100.0**

Source: Bureau of Economic Analysis, 2004a

* Based on NAICS industry classifications.

(D) = Data not available to avoid disclosure of confidential information (too few firms in the category to allow publication of data without risking identification of individual firms and employees). Estimate included in totals.

3.17.3 Unemployment

Table 3.17-4 shows the current labor force and unemployment rate in White Pine County. These data include workers employed at the Robinson Mine, which reinstated mining activities in June 2004.

The average size of the county labor force has increased steadily since 2003 and was estimated at 4,380 workers in October 2006, with a corresponding unemployment rate of 3.8 percent (Rajala, 2007). The current unemployment rate reflects two recent developments: (1) the community is experiencing job growth because of mine operations, new small industrial firms locating in the area, and business expansions; and (2) the northern Nevada region is experiencing job growth because of several other new projects, which is reducing the available labor pool for jobs in White Pine County (WPCEDC, 2006).

TABLE 3.17-4

Labor Force and Unemployment (2006)

Area	Labor Force	Unemployment Rate
White Pine County	4,380	3.8%
State of Nevada	1,264,101	4.1%

Source: Rajala, 2007; Nevada Department of Employment, Training, and Rehabilitation, 2006

Between 1990 and 2006, the size of the labor force and unemployment rates varied considerably in the county. The peak labor force of 4,337 occurred in 1995, which is comparable to current (2006) levels, and dropped to a low of 3,457 in 1999. Since that time, the labor force has expanded, driven in part by new mining activity that has resulted in new workers coming to the area seeking employment. Unemployment peaked in 1993 at 12.2 percent and has been stable at just over 4 percent for roughly the past five years. Although unemployment rates in the county are comparable to the statewide average (4.1 percent in 2006), the labor market in Nevada has been more stable with unemployment rates ranging between 4.1 and 6.9 percent from 1990 to 2006.

Employment conditions in White Pine County are influenced by the local work force's education levels. Based on the 2000 Census, White Pine County's proportionate share of people 25 years and older with a high school diploma or higher education was 82.0 percent; this is higher than both the state value of 80.7 percent and the national value of 80.4 percent (University of Nevada, Reno 2004). However, White Pine County's proportionate share of people 25 years and older with a bachelor's degree is 11.8 percent, which is lower than the state value of 18.2 percent and the national value of 24.4 percent.

The characteristics of the existing labor force have implications for the proposed White Pine Energy Station (as discussed further in Section 4.17, *Socioeconomics*). As reported in the 2006 CEDS report (WPCEDC, 2006), White Pine County has a relatively low unemployment rate and is facing a critical issue of workforce availability and especially workforce skills. The workforce in rural Nevada is fluid and tends to go where the jobs are, especially in the construction industry. Further, there are no major population centers in the county that can provide highly skilled workers in large numbers.

3.17.4 Earnings and Income

Total personal income in White Pine County in 2004 was $259.5 million (Bureau of Economic Analysis, 2004b). Of that total, about $160.5 million (or 62 percent) was attributed to wage earnings and $75.4 million (29 percent) represented non-labor income. Personal income in White Pine County accounted for only 0.3 percent of the total income earned in Nevada in 2004. The per-capita income level in White Pine County was $30,306 in 2004, which is about 11 percent less than per-capita income levels throughout the state. At the household level, the median income level in the county in 2000 was $36,668 compared to $44,581 for the state. Table 3.17-5 summarizes income-related conditions in the county in 2004.

Table 3.17-6 shows place of work earnings by industry in White Pine County in 2004.

Following patterns similar to employment, the *Government* sector had the highest level of wage earnings at $81.7 million, mainly at the state and local level, which accounted for over half (50.9 percent) of all wage earnings in the county. Other sectors that provide a relatively high proportion of wage earnings in the county include *Retail Trade* (6.1 percent) and *Accommodations and Food Service* (5.2 percent). Farm-related earnings only account for 2.5 percent of the county-wide total.

TABLE 3.17-5

Personal Income (2004) [a]

Area	Wage Earnings	Net Earnings [b]	Non-Labor Income [c]	Total Income	Per-Capita Income
White Pine County	$160,478	$184,038	$75,444	$259,482	$30,306
State of Nevada	$61,541,717	$54,881,909	$23,940,225	$78,822,134	$33,787

Source: Bureau of Economic Analysis, 2004b

[a] Values in thousands ($1,000s) of dollars, except for per-capita income levels.

[b] Net earnings (by place of residence) = earnings by place of work (wage earnings) less contributions for government social insurance plus adjustment for residence.

[c] Non-labor income = dividends, interest, and rents plus transfer payments.

TABLE 3.17-6

Earnings by Place of Work by Industry in White Pine County (2004) [a]

Industry/Sector [b]	Earnings	% of Total
Farm Earnings	$4,029	2.5%
Non-Farm Earnings	$156,449	97.5%
Forestry, fishing, related activities and other	(D)	--
Mining	$19,185	12.0%
Utilities	(D)	--
Construction	$7,618	4.7%
Manufacturing	$983	0.6%
Wholesale trade	$1,977	1.2%
Retail trade	$9,720	6.1%
Transportation and warehousing	(D)	--
Information	$1,080	0.7%
Finance and insurance	$3,001	1.9%
Real estate and rental and leasing	$1,000	0.6%
Professional and technical services	(D)	--
Management of companies and enterprises	(D)	--
Administrative and waste services	$2,157	1.3%
Educational services	(D)	--

TABLE 3.17-6

Earnings by Place of Work by Industry in White Pine County (2004) [a]

Industry/Sector [b]	Earnings	% of Total
Health care and social assistance	(D)	--
Arts, entertainment, and recreation	$2,510	1.6%
Accommodation and food services	$8,268	5.2%
Other services, except public administration	$2,741	1.7%
Government	$81,684	50.9%
Federal (incl. military)	$13,623	8.5%
State	$34,487	21.5%
Local	$33,574	20.9%
Total	**$160,478**	**100.0%**

Source: Bureau of Economic Analysis, 2002b

[a] Values in thousands ($1,000s) of dollars

[b] Based on NAICS industry classifications

(D) = Estimate not available to avoid disclosure of confidential information (too few firms in the category to allow publication of data without risking identification of individual firms and employees). Estimate included in totals.

Based on income levels, poverty rates are a good economic indicator of social well-being. In 1999, the poverty rate for families in White Pine County was 10.3 percent (U.S. Census Bureau, 2000c). The poverty rate in the county is slightly lower than the poverty rate in the City of Ely (11.3 percent), but higher than the statewide rate of 7.5 percent.

Wage data can also help characterize income conditions in White Pine County. The average annual wage/salary in the county in 2006 was $36,230, which is slightly higher than the statewide figure of $35,499 (Nevada Department of Employment, Training and Rehabilitation, 2006).

3.17.5 Tax Receipts and Fiscal Resources

Development of the Station has the potential to affect local economic activity, property values, and land tenure, all of which may affect property and sales tax revenues realized by White Pine County.

The county relies on tax revenues to fund public services and programs, and tax revenues represent a large proportion of the county's general fund revenue. The county's projected general fund budget for fiscal year (FY) 2006-07 is $11.5 million (WPCEDC, 2006).

Potential public service and fiscal impacts in White Pine County are of particular interest locally and within Nevada's state government as the county faced potential insolvency at the end of 2005 and came under the supervision of the Nevada Department of Taxation (WPCEDC, 2006). The threat of insolvency was averted with increased revenues, including tax increases allowed under state law to resolve a severe financial condition, a franchise fee imposed by the county, layoffs, and substantial budget reductions. Fortunately, the county and State Department of Taxation were able to avoid closure of county services and facilities; however, the county remains under the supervision of the state and will continue to do so until it is clear that the financial issues have been resolved and the county has policies and procedures in place to support its financial health.

3.17.5.1 Taxable Sales

The current sales and use tax rate in White Pine County is 7.125 percent (effective October 1, 2006). The base sales tax rate in Nevada is 6.5 percent. In White Pine County, an additional 0.25 percent is imposed for public mass transportation and construction of roads; 0.125 percent for extraordinary maintenance, repair, or improvement of school facilities; and 0.25 percent for the construction of a community swimming pool. Taxable sales in White Pine County in FY 2004-2005 were $127.9 million, an increase of 58 percent compared to the previous fiscal year (Nevada Department of Taxation, 2005b). By April 2006, fiscal year-to-date taxable sales in the county were $145.3 million (WPCEDC, 2006). Based on the existing sales and use tax rate of 7.125 percent levied in White Pine County, the estimated tax revenue generated by taxable sales in the county in FY 2004-2005 was approximately $9.1 million. Sales tax revenues are collected at the state level, with a portion of these revenues allocated to the State General Fund and the remaining revenues distributed back to local counties based on statutory formulas. White Pine County, like most rural Nevada counties, is guaranteed a base rate on sales tax revenues to keep revenues from falling below minimum levels. In 2004-2005, taxable sales in White Pine County generated an estimated $2.6 million in State General Fund revenue, nearly $6.1 million in sales tax revenue distributions back to White Pine County, and about $0.4 million in distributions to other Nevada counties. Distributions to White Pine County included local school support tax revenue ($2.0 million, which is distributed to the local school district), basic and supplemental county relief tax transfers ($3.3 million), and optional tax levies ($0.8 million) (Nevada Department of Taxation, 2005b). Based on inter-local agreements, tax revenues distributed to local counties by the state are also subsequently redistributed to local cities/townships and special districts.

3.17.5.2 Property Taxes

White Pine County also receives property tax revenue based on assessments of real and personal property in the county. In Nevada, assessed value is equal to 35 percent of taxable (or market) value. The total assessed value of personal and real property in White Pine County (after exemptions) was $115.6 million in FY 2004-2005, an approximate 8.5 percent decline from the previous year (Nevada Department of Taxation, 2005b). Recent estimates indicate the assessed value of property countywide reached $230.7 million in 2006 (WPCEDC, 2006). Based on this recent figure and the average property tax rate in the county of 3.66 percent, the estimated property tax revenue generated in White Pine County is approximately $8.4 million. Based on historic distributions of property tax revenues in the county, it is estimated that of this amount approximately $3.9 million (or 45 percent) will be retained by White Pine County, with the remaining revenue distributed to the local school district, cities/towns, special districts, and the state.

One component of property taxes is the assessment of centrally-assessed properties, such as the proposed Station. In FY 2004-2005, the assessed value of centrally-assessed properties in White Pine County was $12.5 million (Nevada Department of Taxation, 2005b).

3.17.5.3 Payments-in-Lieu-of-Taxes

White Pine County also receives "payments-in-lieu-of-taxes" (commonly referred to as PILT) from the federal government. PILT payments to counties are intended to help offset losses in property taxes resulting from nontaxable federal lands within their jurisdiction and are made available to help local governments carry out important public services. The U.S. Congress appropriates PILT payments each year. The formula used to compute the PILT payments is based on population, receipt sharing payments, and the amount of federal land within an affected county. As a result, PILT payments vary annually.

Approximately 93 percent of the land in White Pine County is administered by the federal government (the BLM, NPS, Forest Service, and FWS) and only 5 percent is owned by local government and the private sector (WPCEDC, 2006). In FY 2005-2006, White Pine County received approximately $668,200 in PILT payments for the nearly 5.3 million acres of federal land in the county (BLM, 2006). This represents an average PILT payment of approximately $0.13 per acre. Based on the amount of land administered by the BLM in the county (about 4.36 million acres), it is estimated that White Pine County received approximately $550,000 in PILT payments attributed to BLM-administered lands in FY 2005-2006.

3.17.6 Housing

An overview of the existing housing stock in White Pine County, based on 2000 U.S. Census data, is presented in Table 3.17-7. According to U.S. census data, the total housing stock in White Pine County in 2000 was 4,439 units. According to the White Pine County Assessor, the estimate of total housing stock in the county in 2000 was slightly lower at 4,200 units. As of July 2006, the County Assessor showed an increase in housing stock with 4,381 units in the county (WPCEDC, 2006). Approximately half of these units are located in the City of Ely (2,177 units), followed by McGill (609 units), Ruth (212 units), and Lund (85 units). In addition, housing projects currently proposed to be developed within the next 2 years would add up to approximately 170 new housing units in the Ely/Ruth/McGill area (Rajala, 2007). The existing housing supply in the county accounts for less than 1 percent of the statewide housing stock.

TABLE 3.17-7

Housing Characteristics (2000)[a]

Area	Housing Stock [b]	Vacancy Rate: Owner	Vacancy Rate: Rental	Median Value [c]	Median Rent [c]
White Pine County	4,439	6.7%	23.8%	$70,000	$452
City of Ely	2,205	4.9%	25.4%	$71,300	$444
State of Nevada	827,457	2.6%	9.7%	$142,000	$699

Source: U.S. Census Bureau 1990a, 1990b, 2000a, 2000b

[a] Data presented in this table do not reflect economic activity generated by the recent re-opening of the Robinson Mine.

[b] More recent information on the county's housing stock is available from the White Pine County Assessor; this information is reflected in the text presented in Section 3.17.6.

[c] Median value and rent are based on sample data (DP-4)

In 2000, vacancy rates in the county varied considerably between owner-occupied and renter-occupied units, ranging from 6.7 percent to 23.8 percent, respectively. This pattern holds in the City of Ely as well, although there is a slightly lower vacancy rate for owner-occupied units (4.9 percent) and slightly higher rate (25.4 percent) for rental units. Vacancy rates at the state level are substantially lower relative to White Pine County.

The median value of a home in White Pine County and the City of Ely were comparable at $70,000 and $71,300, respectively, in 2000. By 2005, the median value of a home in Ely increased substantially to $152,500 (WPCEDC, 2006); however, local home values are roughly half that for the state as a whole. Rental rates in the City of Ely are less than rental rates across Nevada (approximately $600 per month) (WPCEDC, 2006).

Temporary housing in the county is also provided by a combination of motel rooms and RV parks. According to the White Pine County Chamber of Commerce, White Pine County has 629 motel rooms and 209 RV park spaces, most of which are located in the Ely area (White Pine County Chamber of Commerce, 2006).

Activity in the housing market has increased in recent years with the number of housing sales doubling between 2000 and 2004 (WPCEDC, 2006). The status of the current housing market has been affected by the recent re-opening of the Robinson Mine, including lower vacancy rates and increases in property values. However, and according to WPCEDC (2006) and Rajala (2006), a review of new housing starts data shows that 92 percent of the county's housing stock was built prior to 1978 and many of these homes were painted with lead-based paint. Rural Nevada still does not have any certified lead-based paint abatement contractors to carry out the provisions of lead-based paint regulations. Realtors report that they are already having difficulty getting financing through the Federal Housing Administration for homes with lead-based paint. Thus, the county is currently experiencing a housing shortage (particularly affordable housing) which in turn negatively affects recruiting of new employees. Another factor contributing to the affordable housing shortage is the deterioration of manufactured housing stock in the county and the lack of adequate regulations to prevent importation of older, single-wide manufactured housing into the county that no longer meets code requirements in other areas.

3.17.7 Community Infrastructure and Public Services

The proposed Station and associated ancillary facilities would be located on undeveloped, rural lands in White Pine County. While no public facilities would be directly affected by the physical development of the Proposed Action or Alternative 1, some of White Pine County's public services would likely be affected during construction of the Station (see Section 4.7, *Visual Resources*). The following types of public services could be affected: law enforcement, fire protection, emergency medical services, other medical aid, education and schools, solid waste disposal, and water, wastewater, and power utilities (Impacts on parks and recreation facilities are addressed in Section 4.8, *Recreation Resources*). Existing characteristics of these services are described below.

3.17.7.1 Law Enforcement

Law enforcement in the county is provided jointly by BLM (on public lands), the White Pine County Sheriff's Department (on public roads and private lands), the Nevada Highway Patrol (on state highways), and the NDOW (on public lands). The Sheriff's Department is expected to be the primary source of law enforcement at the Station site. The Sheriff's Department, which is located in and contracts law enforcement services to the City of Ely, is the only full-service law enforcement agency in White Pine County and provides patrol and jail services. White Pine County is served by 15 patrol officers, five dispatchers, five jailers, and one part-time deputy (WPCEDC, 2006). The capacity of the local jail is 40 people (32 male and 8 female). The Sheriff's Department feels an expansion of its jail capacity is currently needed because of an increase in its inmate population and a trend of arrests increasing over time (Rajala, 2006). For example, the average inmate population in 2005 was 17.4 compared to 14 in 2001. Misdemeanor and felony arrests increased by 138 percent over the same time period.

The Sheriff's Department also experienced an increase in law enforcement demands during two large construction projects in the past 20 years—the construction of Ely State Prison in the late 1980s and the construction of the mill at Robinson Copper mine in the mid 1990s. In both instances, the Sheriff's office reported an increase in the number of criminal investigations during construction followed by a sharp decline in the number of investigations following completion of the construction projects. In 1987 and 1988, the Sheriff's office reported 238 and 244 criminal investigations, respectively, followed by a decrease to 214 investigations in 1989 when the prison was opened. In 1995 and 1996, the Sheriff's office reported 390 and 433 investigations, respectively, followed by a decline to 367 investigations in 1997 when the mine was in full operation (Rajala, 2007).

The county's juvenile detention facilities are in a state of disrepair, and as a result, are not used. Juveniles requiring protective custody are transported to facilities in Elko and Lincoln Counties (WPCEDC, 2006).

The response time to the proposed White Pine Energy Station from the Sheriff's Department in Ely would be approximately 30 minutes (Rajala, 2005).

Based on the county's most recent budget data, law enforcement-related expenditures in the county are projected at approximately $2.5 million in FY 2006-2007 (Rajala, 2007).

3.17.7.2 Fire Protection

Wildland fire protection on public lands in White Pine County is primarily provided by the BLM. The BLM's Ely District implements a fire management program in accordance with the *Ely Managed Natural and Prescribed Fire Plan*.

Structural fire protection on private lands is the responsibility of the White Pine County Fire District, which was formed under the provisions of NRS 474 and operates in cooperation with the Nevada Division of Forestry. The District includes seven volunteer fire departments: Snake Valley (Baker), Ruth, McGill, Lackawanna (vicinity between Ely and McGill), Lund/Preston, Cold Creek (northern Newark Valley), and Cherry Creek. The McGill and Cherry Creek Volunteer Fire Departments would provide the initial response to an incident at the Station site, and as needed, backup would be provided from the other rural fire departments and the City of Ely Fire Department. Fire protection services are dispatched through the White Pine County Sheriff's Department.

The nearest fire station to the proposed Station site is the McGill Fire Department, 23 miles away. The McGill Fire Department consists of approximately 20 volunteer firemen, and it maintains two structure trucks, one wildland fire truck, and two medical chase vans. It is also equipped with eight self-contained breathing apparatus (SCBA) units. All of the McGill volunteer firemen have completed the Fire Fighter I training program, and they participate in a variety of training programs each year including HAZMAT training. Response time between McGill and the proposed Station site is estimated at 10 to 35 minutes depending on weather conditions (Rajala, 2005).

All of White Pine County's volunteer fire departments face a continuing concern associated with the difficulty of recruiting and retaining volunteers. The demands for additional training place a notable strain on volunteers who are attempting to maintain and improve levels of service. Concerns also are increasing over worker safety with respect to potential accidents involving hazardous materials (WPCEDC, 2006).

White Pine County maintains an inter-local agreement with the City of Ely for law enforcement, fire protection, and animal control services. For the 2006-07 budget, the City of Ely is scheduled to pay White Pine County about $600,000 for law enforcement through the County Sheriff's Department, with the County paying roughly $170,000 for fire protection at the County Airport and in the unincorporated areas immediately surrounding Ely and $22,000 for animal control services; the net payment from the City of Ely to White Pine County is nearly $400,000 (Rajala, 2007).

3.17.7.3 Emergency Medical Services

Emergency medical services provided in the county are supervised by the White Pine County Ambulance Service, recognized as an Intermediate Ambulance Service by the State of Nevada. The Service and all volunteer Emergency Medical Technicians (EMTs) are licensed by the Nevada State Health Division. Transports are assigned to William Bee Ririe Hospital by medical direction. Volunteer emergency medical services are provided in the communities of Ely, Ruth, McGill, Baker and Lund, and are dispatched by the White Pine County Sheriff's Department.

McGill Emergency Medical Service is the closest to the Station site and would be the first service paged to respond to a Station-related incident. It maintains two ambulances that are licensed by the State of Nevada. Response times to the Station site would vary from 10 to 35 minutes depending on the weather. The other service centers are paged for backup as needed. Several area firemen are also licensed EMTs. Local fire departments act as first responders for all emergency medical calls and provide assistance with lifting, extrication, traffic, and crowd control. As warranted, patients may be stabilized at William Bee Ririe Hospital and sent to urban hospitals for specialized treatment via life flight. AccessAir out of Elko, Nevada, may be utilized in severe emergencies and flight times to the Station site from Elko could be as short as 20 minutes.

As with the volunteer fire services, the White Pine County Ambulance Service faces continuing concerns about recruitment and retention. In addition, response times and availability of McGill EMTs may vary during the daytime hours when volunteer EMTs are at their places of employment.

3.17.7.4 Other Medical Aid

The nearest medical facility to the proposed Station power plant is William Bee Ririe Hospital, a "critical access hospital" in Ely. The hospital is approximately 34 miles from the Proposed Action power plant site and 22 miles from the Alternative 1 power plant site. This facility is a fully accredited 40-bed hospital providing in-patient medical, surgical, obstetrical, and intensive care unit services. The hospital also provides long-term care, out-patient services for surgery, physical therapy, respiratory therapy, and 24-hour physician-attended emergency room services. All physicians in White Pine County are employed by William Bee Ririe Hospital. The hospital also owns and operates the William Bee Ririe Medical Rural Health Clinic, which was completed in 2000. Plans have been approved for expansion and remodel of the hospital. The current utilization rate at the William Bee Ririe Hospital is 16 percent (WPCEDC, 2006).

William Bee Ririe Hospital and the Hospital Clinic maintain visiting services from specialists including cardiologists, orthopedic surgeons, and internists who provide visitation and medical services on an itinerant basis. Area physicians may send patients via life flight or referral to surrounding urban hospitals in Salt Lake City, Las Vegas, or Reno. Flight times vary and may be as short as 45 minutes, but average 1 to 2 hours.

3.17.7.5 Education and Schools

White Pine County is served by public elementary, middle, and high schools. Four elementary schools are located in the county, in the communities of Baker, Lund, McGill, and Ely. One middle school and high school are located in Ely, the primary population center in the county. Another high school is located in Lund. Total enrollment in the White Pine County School District in the 2006-07 school year was 1,429 students, which is approximately 53 percent of the total school district capacity of 2,680 students. One high school is also located at the prison and one alternative education high school is located in Ely; these facilities would not likely be affected by the proposed Station.
Table 3.17-8 summarizes school enrollment and capacity in White Pine County.

TABLE 3.17-8

School Enrollment and Capacity (2006-07)

School	Capacity	Enrollment
David E. Norma Elementary	700	415
Baker Elementary	4	21
McGill Elementary	350	137
Lund K-12	250	109
White Pine Middle School	600	323
White Pine High School	600	402
NOVA	20	13
Murray Street	120	0 (Vacant)
Out of State Students*	N/A	24
Total	**2,680**	**1,429**

Source: Rajala, 2007
*Of the 24 out-of-state students, eight are in elementary schools, five are in middle school, and 11 are in high school. It is not possible to determine which schools they attend based on student records.

The average expenditure per pupil in the county was $4,786, which was greater than the state average of $3,751 (WPCEDC, 2006). School enrollment in the District dropped about 4 percent between 2003 and 2004 and remains lower than historic levels when the Robinson Mine was in full operation (White Pine County, 2004). This indicates a shift to a senior and retirement population and away from young families with school-aged children. However, this trend has reversed with the recent re-opening of the mine. School enrollment increased slightly by four students from the 2003-04 to 2005-06 school years.

No schools are located in the immediate vicinity of the Station project area. The nearest school (McGill Elementary School) is in the town of McGill, approximately 22 miles south of the Station Proposed Action power plant site. The nearest secondary schools are in Ely, approximately 34 miles away.

3.17.7.6 Social Services

As summarized in the 2006 WPCEDC CEDS report (WPCEDC, 2006), social services in the county are provided by a variety of state and county agencies as well as by private, voluntary groups. White Pine County does not have a homeless, transient, or battered women's shelter. Emergency financial assistance is available through the county Social Services Department and Salvation Army. These financial services consist of emergency shelter (via a motel voucher program), food, transportation, rental deposit assistance, and medical and burial assistance. Food stamps are available through the Nevada Department of Human Resources, Food Stamps and Welfare Divisions. The Women and Infant Children Supplemental Foods Program provides nutrition education and assistance in purchasing certain types of food for low-income families with infants and pre-school children. A variety of other services are provided by Support, Inc., the White Pine Rehabilitation and Training Center, a number of church organizations, and Little People's Headstart, which provides childcare services for low-income parents.

The county's social services director has reported that in the past, when large construction projects are hiring workers, some of the people coming into the area looking for work need social services; in fact, this is occurring now with the mine and prisons currently hiring people (Rajala, 2006). Most of these people are transients, and if they cannot find employment, they typically need money for lodging (before they move on), food, and transportation. Also, new hires in the region often need assistance between the time they start their job and their first paycheck to cover deposits for renting apartments or to help pay for food, clothing, etc.

3.17.7.7 Solid Waste Disposal

Solid waste in the Ely, Ruth, and McGill areas of White Pine County is disposed of at the City of Ely Landfill, an active Class I facility that was permitted in 1998. Currently, the Ely landfill processes approximately 25 tons of solid waste per day and has a total capacity of approximately 1.86 million cubic yards for all types of waste. Recently, the City of Ely has received a Class III Landfill Permit to expand the landfill facility to accommodate construction waste; the estimated available capacity for construction-related waste is 300,000 cubic yards (Rajala, 2006). According to the 2004 Solid Waste Management Plan, the projected closure date for the landfill is 2081 (Nevada Division of Environmental Protection, 2004). However, the landfill is using its capacity at a faster rate than anticipated and there has been an identified need to develop an alternative landfill site to accommodate the future needs of the local population and construction projects (WPCEDC, 2006).

White Pine County's 2006 Solid Waste Management Plan Revision was approved by the Nevada Division of Environmental Protection (NDEP) in September 2006. The revised Plan includes the future development of a private Class III landfill at the Station site.

3.17.7.8 Road Maintenance

The primary road to be used by Station construction and operation traffic is U.S. 93, which is maintained by the Nevada Department of Transportation. Only one county road would serve the proposed Station, a 5-mile segment of a county gravel road that would be used to transport gravel from a quarry site (WPEA, 2006).

Traffic is sparse on highways through White Pine County, and Nevada Department of Transportation figures show they all have capacity to carry more traffic than currently uses them (WPCEDC, 2006). When improvements and maintenance are needed, a portion of the gasoline tax levied on gasoline purchases in the county is allocated to the Regional Transportation Commission to fund road improvement projects for the City of Ely and the county.

3.17.7.9 Utilities

3.17.7.9.1 Water and Wastewater

No public water supplies or sewer systems are currently located in the Station project area, and none would serve the Station during construction or operations. Instead, private ground water wells supply potable water in the Station project area and on-site septic systems are used to treat and dispose of wastewater.

Public water and sewer service are available in larger communities. Service providers include the Ely Municipal Water Department, McGill-Ruth Sewer and Water General Improvement District, and the Baker Water and Sewer General Improvement District. The capacity of these public water/sewer systems is as follows (Rajala, 2007):

- City of Ely. Water capacity is 640 to 1,334 residential equivalents (1.5 gallons per minute). The range is based on the potential loss of one well. Sewer capacity ranges between 460 and 1,460 residential equivalents (which is equal to 400 gallons per day). This range is based on NDEP rated treatment capacity at 1.5 million gallons per day versus operator estimate at 1.1 million gallons per day.
- McGill. Water capacity is 227 residential equivalents with the largest well out (1.0 gpm/residential equivalent metered). Sewer capacity is 117 to 185 residential equivalents.
- Ruth. Water capacity is 122 residential equivalents based on the largest pump out scenario. Sewer capacity ranges from -1 to 14 residential equivalents.

3.17.7.9.2 Power

The proposed Station is in the service area of the Mt. Wheeler Power Company, a rural electrical power cooperative serving areas within White Pine and Eureka Counties, as well as portions of western Utah. Mt. Wheeler Power operates under an "All Requirements Contract" with its power supplier. Power loads of 2.5 MW and larger must be supplied via a negotiated contract (Robinson, 2007). Mt. Wheeler Power has no power generation of its own, but has contracts that should meet current and future demands for power in their service area (WPCEDC, 2006). Natural gas service is not provided in White Pine County.

3.18 Transportation

This section discusses existing roadways that could provide access to the White Pine Energy Station Proposed Action and Alternative 1 power plant sites for project construction workers, construction materials and equipment deliveries, and project operation personnel.

The Proposed Action power plant site is located approximately 34 miles north of Ely, 22 miles north of McGill, and 1 mile west of U.S. 93. The Alternative 1 power plant site is located approximately 22 miles north of Ely, 10 miles north of McGill, and 1 mile west of U.S. 93. Access to either power plant site would be from U.S. 93. Paved access to these power plant sites does not currently exist.

Workers, materials, and deliveries could originate from many cities during project construction and operation. Potential source towns and cities were identified and freeways/highways associated with them were considered potential routes to be evaluated. Table 3.18-1 lists the source towns and cities and the associated roadways that are discussed in this section.

U.S. 6 is an east-west highway that connects SR 318 with Ely. U.S. 50 is an east-west highway that intersects with U.S. 93 at Ely.

U.S. 93 is a north-south highway that intersects with I-15 in southeastern Nevada and continues north into Idaho. It also intersects with I-80 in the northeastern part of the state, U.S. 50 in the east-central part of the state at Ely, and SR 318 in southeastern Nevada.

The Level of Service (LOS) of a roadway is a grading system for the amount of traffic congestion on the road. LOS "A" is the least amount of congestion and LOS "F" refers to the greatest amount of congestion (see Table 3.18-2). Roadway design capacity for the LOS considers speed limits, the number of lanes, curves, hills, width of lanes, and shoulder slope (Leegard, 2007).

TABLE 3.18-1

Potential Source Towns and Cities for Project Construction and Operation Personnel and Associated Roadways to the White Pine Energy Station Project Sites

Town/City	Freeway/Highway
Elko, Nevada	I-80 and U.S. 93
McGill, Nevada	U.S. 93
Wells, Nevada	I-80 and U.S. 93
West Wendover, Nevada	I-80 and U.S. 93
Wendover, Utah	I-80 and U.S. 93
Salt Lake City, Utah	I-80 and U.S. 93
Ely, Nevada	U.S. 93
Eureka, Nevada	U.S. 50 and U.S. 93
Austin, Nevada	U.S. 50 and U.S. 93
Pioche, Nevada	U.S. 93
Las Vegas, Nevada	I-15 and U.S. 93 or I-15, U.S. 93, SR 318, and U.S. 6

TABLE 3.18-2

Roadway Levels of Service

Level of Service	Description
A	Free flow with low volumes and high speed
B	Reasonably free flow, but speeds beginning to be restricted by traffic conditions
C	In stable flow zone, but most drivers are restricted in the freedom to select their own speeds.
D	Approaching unstable flow; drivers have little freedom to select their own speeds.
E	Unstable flow; may be short stoppages
F	Unacceptable congestion; stop-and-go forced flow.

I-15 is the main north-south route connecting Las Vegas, Nevada, and Salt Lake City, Utah. I-80 is an east-west interstate freeway that traverses Nevada in the northern part of the state. SR 318 is a north-south highway that connects U.S. 93 with U.S. 6.

Characteristics of these roadways (existing LOS, average daily vehicle traffic [ADT] volumes, estimated recent average daily truck traffic [ADTT] volumes, estimated 2007 ADT and ADTT volumes, peak hour traffic volumes, peak hours, roadway classification, number of traffic lanes, and roadway condition) are presented in Table 3.18-3. The existing LOS for all of the sections of roadway identified in Table 3.18-3 is A (Leegard 2006, 2007).

The Nevada Northern Railroad (NNR) is an existing, but currently inactive, north-south rail line that is located west of the Proposed Action and Alternative 1 power plant sites. This inactive section extends from Cobre, Nevada, to McGill, Nevada. The NNR line lies within approximately 1 mile of the Proposed Action power plant site and within approximately 2 miles of the Alternative 1 power plant site. The NNR would be used to deliver coal via rail spur to either power plant site for operation.

Through years of inactivity, the railroad is no longer capable of supporting rail traffic. Independent of the White Pine Energy Station, the railroad is now proposed to be rehabilitated and operated by the City of Ely and the White Pine Historical Railroad Foundation. It is intended to serve as both a freight line and a tourist attraction. The proposal is to rehabilitate the rail to a Federal Railroad Administration Class III rating. This rating would also be required to accommodate coal train traffic. Several sidings would be provided to allow the passage of trains. A description of the proposed 110-mile (Shafter to McGill Junction) rehabilitation and its associated potential impacts are addressed in an Environmental Assessment (David Evans and Associates, Inc., 2002) that was prepared in support of a grant application to the U.S. Department of Commerce, Economic Development Administration, by the City of Ely.

TABLE 3.18-3

Roadway Characteristics of Potential Routes to the Alternative Project Sites

Roadway Name	Existing Level of Service (LOS)[a]	2004 ADT[b,c]	Estimated 2004 ADTT[d]	Estimated 2004 Peak Hour Traffic[e]	Estimated 2007 ADT[f]	Estimated 2007 ADTT[g]	Estimated 2007 Peak Hour Traffic[h]	Peak Hours[e]	Roadway Classification[i]	Roadway Condition[j]
U.S. 6 north of intersection with SR 318	A	1,350	265	68	1,301	255	65	Morning: 6-7 Daily: 3 p.m. Afternoon: 5-6	Other Principal Arterials	Good
U.S. 50 east of SR 376	A	590	116	30	632	124	32	Morning: 6-7 Daily: 3 p.m. Afternoon: 5-6	Other Principal Arterials	Good
U.S. 50 east of Eureka	A	1,800	353	90	1,929	378	96	Morning: 6-7 Daily: 3 p.m. Afternoon: 5-6	Other Principal Arterials	Good
U.S. 93 south of junction with U.S. 93A at Lages Station	A	1,250	245	63	1,465	287	73	Morning: 6-7 Daily: 3 p.m. Afternoon: 5-6	Other Principal Arterials	Good
U.S. 93 near McGill	A	1,562	306	78	1,831	359	91	Morning: 6-7 Daily: 1 p.m. Afternoon: 4-5	Other Principal Arterials	Good
U.S. 93 near Pioche	A	1,335	231	80	1,431	248	86	Morning: 6-7 Daily: 1-3 p.m. Afternoon: 4-5	Other Principal Arterials and Minor Arterials	Good
U.S. 93 near SR 318	A	1,650	323	83	1,768	347	88	Morning: 6-7 Daily: 3 p.m. Afternoon: 5-6	Other Principal Arterials	Good
U.S. 93A south of West Wendover	A	440	76	22	516	89	26	Morning: 6-7 Daily: 3 p.m. Afternoon: 5-6	Minor Arterials	Good
I-15 near Las Vegas	A	19,668	1,947	983	22,790	2,256	1,139	Morning: 5-6 Daily: 3-5 p.m. Afternoon: 5-6	Interstate Highways	Good

TABLE 3.18-3

Roadway Characteristics of Potential Routes to the Alternative Project Sites

Roadway Name	Existing Level of Service (LOS)[a]	2004 ADT[b,c]	Estimated 2004 ADTT[d]	Estimated 2004 Peak Hour Traffic[e]	Estimated 2007 ADT[f]	Estimated 2007 ADTT[g]	Estimated 2007 Peak Hour Traffic[h]	Peak Hours[e]	Roadway Classification[i]	Roadway Condition[j]
I-80 east of Elko	A	5,161	511	258	5,161	511	258	Morning: 6-7 Daily: Noon Afternoon: 5-6	Interstate Highways	Good
SR 318 near Sunnyside Road	A	1,070	210	54	1,223	240	61	Morning: 8-9 Daily: Noon Afternoon: 5-6	Other Principal Arterials	Good

Source:

[a] Leegard, 2006, 2007.

[b] NDOT, 2005a (for U.S. 6, U.S. 50, U.S. 93, SR 318, and I-80).

[c] U.S. Department of Transportation, 2001. Calculated for I-15 based on Clark County population estimates and population growth.

[d] NDOT, 2005b. Calculated by reviewing the Nevada Roadway Functional Classification Map and multiplying the ADT by the statewide truck and passenger car percentages for rural roads (U.S. 6, U.S. 50, U.S. 93, and SR 318), and for urban roads (I-15 and I-80).

[e] NDOT, 2005c. Determined by reviewing the Annual Hourly Day of Week Summary for 2004 Reports. In some cases where data were not provided, peak hours were assumed to be similar to other highways, and peak hour traffic was assumed to be 5 percent of ADT.

[f] Calculated U.S. 6, U.S. 50, U.S. 50, and SR 318 by reviewing historical (1995 – 2004) AADT records and applying the average growth rate to 2004, 2005, and 2006 to calculate the estimated 2007 ADT. Calculated I-15 and I-80 by reviewing historical (2001) AADT records and applying the Clark County and Elko County population growth rates for 2001-2004, and applying the applicable growth rate to calculate the estimated 2007 ADT.

[g] Calculated by applying to the 2007 ADT the same percentage as determined applicable for footnote "d".

[h] Calculated by applying to the 2007 ADT the same percentage as determined applicable for footnote "e". In some cases where data were not provided, peak hour traffic was assumed to be 5 percent of ADT.

[i] Determined by reviewing the Nevada Roadway Functional Classification Map.

[j] Assumed to be good condition.

4.1 Introduction

This chapter describes environmental consequences that would result from the construction, operation, and maintenance of the White Pine Energy Station (the Station) for the Proposed Action and Alternative 1. The impact analysis focuses on potential direct, indirect, and cumulative impacts on project area resources that were described in Chapter 3, *Affected Environment*. Direct and indirect effects of the Proposed Action and Alternative 1, together with mitigation measures that would avoid, reduce, rectify, or compensate for certain adverse effects, are discussed by project area resource in Sections 4.2 through 4.18 of this chapter. Effects of implementing the No Action Alternative also are described in each of these sections.

Sections 4.2 through 4.18 also summarize potential impacts of two connected actions that were described in Section 2.2.3.7, *Connected Actions*. They are the Southwest Intertie Project (SWIP) and the Nevada Northern Railroad (NNR) Project. The Council on Environmental Quality defines connected actions as those actions that are being pursued independently but must occur if the subject action is to proceed, and therefore requires a description of their effects in environmental documents. Potential impacts of the SWIP and the NNR Project are summarized in this Draft Environmental Impact Statement (DEIS) because they have been determined to be actions connected to the proposed White Pine Energy Station. Section 4.1.2, *Connected Actions Data Sources*, provides additional background information on these two connected actions. The order of discussion of effects in Sections 4.2 through 4.18 is Proposed Action, Alternative 1, Connected Actions, and No Action Alternative.

Descriptions and cumulative effects of projects listed in Chapter 1, Section 1.7, *Projects Considered for Cumulative Analysis* are presented in Section 4.19, *Cumulative Impacts*. The SWIP and the upgrade and operation of the NNR Project are among those projects analyzed for cumulative effects and discussed in Section 4.19. The final sections of this chapter describe unavoidable adverse impacts, short-term uses of the environment and long-term productivity, the irreversible and irretrievable commitments of resources, energy requirements and conservation potential, and monitoring.

4.1.1 Assumptions and Assessment Guidelines

Assumptions and assessment guidelines for specific resources are summarized in the appropriate resource topics in this chapter. Common assumptions that were followed during the preparation of this DEIS include the following:

- Station features were designed only to the feasibility level, which represents reasonable approximations for assessing potential project impacts and recommending appropriate mitigation measures.
- The expected life of the Station is 40 years or longer.
- WPEA wants to have the flexibility to construct the Station in up to 3 phases. Each phase would include the construction of a 530-megawatt (MW) unit. Three scenarios of how the sequencing of construction would

occur are analyzed in Section 4.17, *Socioeconomics*, of this chapter.

- The design of the wellfield and associated pipeline would have sufficient capacity to supply the Station.
- Environmental resource data have been developed and analyzed to the level of detail necessary to understand potential impacts and to distinguish Station effects (both beneficial and adverse) among the Proposed Action, Alternative 1, and the No Action Alternative.
- Ground water data developed for this study are the best available representation of current and predicted conditions.
- Measures described in Appendix A, *Best Management Practices,* are an integral part of the Proposed Action and Alternative 1.
- Any required mitigation measures would be implemented prior to the construction of Station features.
- As required for the issuance of rights-of-ways (ROWs) by the BLM, a Plan of Development would be finalized for the alternative selected for implementation. Prior to construction, a Construction, Operation, and Maintenance Plan would be prepared that details the methods and procedures to be used in the construction of Station features. The Construction, Operation, and Maintenance Plan will incorporate site-specific stipulations, terms, and conditions in order to satisfy all Station-related construction requirements, as well as operational, maintenance, and restoration requirements associated with lands administered by the Ely Field Office of the BLM where Station features would be located.
- Cumulative impacts consist of the potential impacts of the Proposed Action or Alternative 1 for the White Pine Energy Station plus the potential impacts of the past, present, and reasonably foreseeable projects identified in Section 1.7, *Projects Considered for Cumulative Analysis*. Only those projects that meet the criteria listed in Section 1.7 and discussed in Section 4.19, *Cumulative Impacts*, are assessed for potential cumulative impacts. As described in Section 4.1.3 below, incomplete or unavailable information for many of these projects necessitated a broad qualitative analysis and characterization of possible cumulative effects.

4.1.2 Connected Actions Data Sources

The SWIP and NNR Project have been determined to be actions connected to the proposed White Pine Energy Station. SWIP transmission lines from the north and south would be connected to the Station power plant to provide a precautionary measure of redundancy. The rehabilitated and upgraded NNR would be used to convey coal to the Station railroad spur and power plant for use in generating electricity. The SWIP and NNR Project will occur even without the White Pine Energy Station.

4.1.2.1 Southwest Intertie Project

Potential impacts that were described in the Southwest Intertie Project (SWIP) Final EIS (BLM, 1993) for the segment of the proposed SWIP electrical transmission line between Midpoint, Idaho, and the Harry Allen Substation in Nevada are summarized in Sections 4.2 through 4.18. Major concerns for each resource area that were identified in the assessment of possible SWIP effects, together with mitigation measures that were recommended to avoid or minimize the potential occurrence of these major concerns, are noted. Specific impacts identified in the SWIP Final EIS for that portion of the SWIP corridor that would contain the proposed White Pine Energy Station transmission line are noted. This DEIS incorporates the SWIP Final EIS (BLM, 1993) by reference.

4.1.2.2 Nevada Northern Railroad (NNR) Project

Potential impacts that were described in the Environmental Assessment (David Evans and Associates, Inc., 2002) for the proposed rehabilitation and reinstatement of train operations over the existing NNR are summarized in Sections 4.2 through 4.18. The Environmental Assessment analyzed the effects of NNR rehabilitation and reinstatement between Shafter (milepost 18.5, to the north) and McGill Junction (milepost 128.4, to the south). Information presented in the Rehabilitation Plan for the NNR that was prepared for WPEA by Caldwell Richards Sorensen (CRS) Consulting Engineers and Mountain States Contracting (MSC) (CRS and MSC, 2005) also is summarized in Sections 4.2 through 4.18. The Rehabilitation Plan covers the NNR from milepost 0 at Cobre (juncture of the NNR with the Union Pacific Railroad) to milepost 115 (site of the White Pine Energy Station Alternative 1 railroad spur). For purposes of reference, the White Pine Energy Station railroad spurs leading from the NNR to the Proposed Action and Alternative 1 power plant sites would be located at approximately mileposts 103 and 115, respectively. The NNR Rail Line referred to in Sections 4.2 through 4.18 includes the NNR and the land within the original NNR ROW that was granted by the BLM, but has since been conveyed by the BLM to the City of Ely. This DEIS incorporates the NNR Environmental Assessment (David Evans and Associates, Inc., 2002) and the NNR Rehabilitation Plan (CRS and MSC, 2005) by reference.

Where information on specific resources along the NNR was not available, the best available representative information was used. Information available in the Environmental Assessment (David Evans and Associates, Inc., 2002) for the NNR Project was informative but limited for some of the resources because of the rather brief resource descriptions typically required in an Environmental Assessment for assessing potential project effects. The NNR Environmental Assessment was never filed as a NEPA document. By comparison, much more detailed information was available for the SWIP because of the NEPA-driven EIS (BLM, 1993) that was required and prepared for that project, and the extensive resource descriptions typically required in an EIS for assessing potential project effects.

4.1.3 Incomplete and/or Unavailable Information

The Code of Federal Regulations at 43 CFR 1502.22 mandates that agencies evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS must identify potentially incomplete or unavailable information. Potentially incomplete or limited information was available for many of the projects considered in the cumulative impact analysis. This necessitated a broad qualitative analysis and characterization of possible cumulative effects as opposed to a site-specific quantitative assessment.

4.2 Geology, Soils, and Minerals

Potential Station-induced environmental consequences to geology, soils, and minerals include impacts associated with seismic events, soils removal or possibly increased erosion, and impacts to mining operations.

4.2.1 Proposed Action

4.2.1.1 Seismic Events

The risk of adverse ground acceleration (shaking) as a result of seismic events is perceived to be very low throughout the project area for the Station Proposed Action.

4.2.1.2 Soils

Potential Station-induced environmental consequences to soil resources include loss of soils resulting from direct removal during Station construction or through enhanced opportunity for soil erosion.

The Station has been designed to minimize the acreage of soils disturbed. Approximately 1,902 acres would be temporarily disturbed during the construction of the various Station components under the Proposed Action (see Table 2-1 in Chapter 2). Of this total, approximately 392 acres would be reclaimed, and approximately 1,510 acres, including 1,281 acres for the Power Plant ROW that BLM would sell to WPEA, would be used for Station features.

Soils disturbed during Station construction activities could result in a temporary increase in erosion and windblown dust until construction is completed. Construction of the transmission line in areas where soils are shallow and on steep slopes (through the Egan Range) is a particular concern. The planned implementation of protective measures contained in Appendix A, *Best Management Practices,* would minimize erosion and soil loss during and following Station construction.

4.2.1.3 Minerals Operations

No active mining operations exist in the immediate vicinity of the proposed Station components (energy station, access roads, wellfield, water pipeline, rail spur, or transmission line) that would be affected by the construction and operation of the Station Proposed Action. The Proposed Action neither is located on nor crosses property with active leases for oil and gas, development, except for active leases for either oil or gas at the proposed Thirtymile Substation site. Currently, there are several active leases for geothermal development in the vicinity of the project features for the Proposed Action, but none of these leases currently have active development of geothermal resources.

The 40-acre mineral materials sale area that would supply sand and gravel needs to the Station would no longer be available for mining. In addition, all ROWs would restrict future mining operations for the life of the Station, as well as the potential for oil, gas, and geothermal development.

The BLM has the option of including any underlying minerals beneath the Proposed Action Power Plant ROW in the sale of the power plant site to WPEA. If the BLM chooses not to use that option, there is the potential for a split estate with WPEA only owning the land surface at the power plant site.

4.2.1.4 Mitigation

No mitigation is required for the Proposed Action.

4.2.2 Alternative 1

4.2.2.1 Seismic Events

The risk of adverse ground acceleration (shaking) as a result of seismic events is perceived to be very low throughout the project area for Station Alternative 1.

4.2.2.2 Soils

Approximately 1,946 acres of soils would be temporarily disturbed during the construction of Station components under Alternative 1 (see Table 2-3 in Chapter 2). Of this total, approximately 377 acres would be reclaimed, and approximately 1,569 acres, including 1,330 acres for the Power Plant ROW that BLM would sell to WPEA, would be used for Station features. Protective measures contained in Appendix A, *Best Management Practices* would be implemented to minimize Station-related erosion and soil loss.

4.2.2.3 Minerals Operations

No active mining operations exist in the immediate vicinity of Station components that would be affected by the construction and operation of Alternative 1. The Alternative 1 site is not located on property with active leases for oil and gas, development, except for active leases for either oil or gas at the proposed Thirtymile Substation site. Currently, there are several active leases for geothermal development in the vicinity of the project features associated with Alternative 1, but none of these leases currently have active development of geothermal resources.

The 40-acre mineral materials sale area that would supply sand and gravel needs to the Station would no longer be available for mining. In addition, all ROWs would restrict future mining operations for the life of the Station, as well as the potential for oil, gas, and geothermal development.

As noted for the Proposed Action, the BLM has the option of including any underlying minerals beneath the Alternative 1 Power Plant ROW in the sale of the power plant site to WPEA. If the BLM chooses not to use that option, there is the potential for a split estate with WPEA only owning the land surface at the power plant site.

4.2.2.4 Mitigation

No mitigation is required for Alternative 1.

4.2.3 Connected Actions

4.2.3.1 SWIP

4.2.3.1.1 Geology

No specific areas of geologic concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line (BLM, 1993).

4.2.3.1.2 Soils

Major soils concerns addressed in the SWIP Final EIS included wind erosion, water erosion, compaction, reduced productivity, and areas of prime or unique farmlands (BLM, 1993). Impacts to soils could occur for short distances (approximately 0.4 mile at a time) where roads would be constructed in the SWIP corridor on slopes steeper than 35 percent. Most areas with steep slopes and potential soils impacts from road construction and use could be avoided by spanning with transmission lines (BLM, 1993). Primary areas of soils concerns in Nevada were initially identified along SWIP alternative study corridors in the Egan Range. However, no such concerns were identified in this mountain range for the SWIP corridor selected as the Agency Preferred Alternative in the SWIP Record of Decision and in which the White Pine

Energy Station transmission line would be located (BLM, 1994).

4.2.3.1.3 Minerals

The major concern was potential impacts to mineral resource recovery in areas of existing or possible future mineral activity (BLM, 1993). Most of the SWIP corridor crosses areas where the development of mineral resources is uncertain. With the implementation of mitigation measures (for example, avoid mineral resources or follow existing ROWs), potential impacts on mineral resources along the SWIP corridor would be reduced. The proposed transmission line would have a positive effect on sand and gravel operators who would supply these materials during project construction. Also, the transmission line could benefit mining operators by providing a nearby source of electricity for their operations (BLM, 1993). No specific areas of mineral resources concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line.

4.2.3.2 NNR

4.2.3.2.1 Geology

No impacts to geologic resources are expected as a result of NNR rehabilitation and operation (David Evans and Associates, Inc., 2002).

4.2.3.2.2 Soils

Soils would be disturbed during NNR construction from excavations within the NNR alignment to replace rails, cross ties, and ballast (David Evans and Associates, Inc., 2002). As a result, some fugitive dust would be generated and some limited erosion could occur. Only limited soil disturbance would occur during NNR operation. Recommended measures during NNR upgrade to reduce project-related soil erosion and fugitive dust include erosion control (soil binders, reseeding), dust control (watering), directional drainage away from the track bed, and reseeding disturbed areas (David Evans and Associates, Inc., 2002). Any surface disturbance to lands within the NNR alignment (except at culverts and drainage channels) would be cleaned and restored to allow the re-growth of native vegetation after NNR restoration is complete (CRS and MSC, 2005).

Because ballast beneath and along the NNR is scarce and the rail bed shoulders are steep between mileposts 55 and 115, ballast would need to be widened approximately 2 to 5 feet on each side from the base of the rail bed. Ballast would be procured from local sources or imported from remote sources, depending on cost and availability (CRS and MSC, 2005). Sub-ballast along the track is non-existent, but likely would not be required for rehabilitation except in areas with soft, wet soils (CRS and MSC, 2005).

4.2.3.2.3 Minerals

Restoration of NNR operations would not adversely impact mineral resources and activities. NNR operation would allow the cost-effective transport of ore from the Robinson Mining District by train to outside areas, which is a beneficial impact (David Evans and Associates, Inc., 2002). This benefit would also apply to any other new mining ventures.

4.2.4 No Action Alternative

No Station-induced environmental consequences on geology, soils, or minerals would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.3 Surface Water Resources

This section discusses potential Station-induced environmental consequences and corresponding mitigation associated with surface water resources in Steptoe Valley. As described in the following text, implementation of either the Station Proposed Action or Alternative 1 would have the same or similar environmental consequences with respect to surface water resources.

4.3.1 Proposed Action

4.3.1.1 Potential for Flooding

The location of the Proposed Action power plant site is within a Zone D flood area (undetermined flood hazards) as designated by the Federal Emergency Management Agency. While the local flood hazard is officially undetermined, some portions of the footprint of the proposed power plant site have a potential to flood as a result of high runoff in Duck Creek and/or the smaller local ephemeral drainages and washes that cross this site. This potential, however, is considered very low based on observations of an absence of flooding at the proposed Station sites during the spring of 2005, which was characterized by relatively high precipitation and snowmelt runoff (see Section 3.3.2, *Local Climate*). This conclusion is further supported by the absence of evidence of historical Duck Creek flooding at the plant site. The difference in elevation between Duck Creek (about 0.5 mile to the west) and the Proposed Action power plant site is approximately 15 feet.

The local ephemeral washes that cross the Proposed Action power plant site footprint could be affected by locally high-intensity rainfall events, which, in turn, could cause these local washes to carry high volumes of runoff for short periods of time. The potential for the actual flooding of some portion of the power plant site from runoff in these washes under these conditions, however, is considered low.

4.3.1.1.1 Impacts

Power Plant Site

Construction of the Proposed Action power plant at the proposed location would create areas that are impervious (covered by impermeable surfaces such as roofs, roads, parking areas), which would increase the amount of local runoff during storms. The area rendered impervious by the power plant would be collectively (from the power plant facilities, coal pile area, solid waste disposal facility area, evaporation pond, and cooling towers) approximately 400 total acres. Based on the maximum daily rainfall recorded at Ely Airport (2.87 inches), the corresponding storm water runoff from these 400 impervious acres would be approximately 96 acre-feet, or approximately 48 cfs, averaged over 24 hours collectively from all impervious areas on the power plant site.

Linear Features

During both Station construction and operation, the linear facilities associated with the Station (for example, access road, water pipeline, and rail spur) would not affect the ephemeral washes they cross. The water pipeline connecting the water supply wells to the power plant would be buried sufficiently deep so as not to affect water flow or erosion processes (scouring) in the bottom of these drainages. Any crossing of a local drainage by a road would utilize culverts to channel storm water under the road. These culverts would be sized appropriately according to local requirements. Therefore, the road would be flooded only during extreme runoff events, and flooding would not constitute an environmental impact. The rail spur would be constructed on a raised berm and cross Duck Creek and adjacent wetland areas via a bridge. These support features would be constructed to enable flood water to flow past the rail spur and prevent any associated damage to the rail spur from flooding. As a result, the rail spur would not result in an environmental impact with respect to flooding.

Wellfield

The wellhead structures associated with each well would occupy an area of less than 1 acre and would be located away from ephemeral washes and other low-lying areas susceptible to flooding. In addition, the impervious area around each well would be small (likely less than 300 square feet). No additional surface water runoff would be generated by these impervious areas. Therefore, construction and operation of the wellfield would not affect the local surface water resources of Steptoe Valley.

4.3.1.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.3.1.2 Potential for Surface Water Features to Be Affected as a Result of Station-Induced Ground Water Level Declines

This is discussed in Section 4.4, *Ground Water Resources*.

4.3.1.3 Potential for Surface Water Quality Degradation

4.3.1.3.1 Impacts

Both Station construction and operation could potentially affect the surface water quality of the local washes and Duck Creek. Water quality in the washes could be degraded by the addition of both suspended solids (sediment) and dissolved constituents (substances commonly found in storm water runoff from parking lots and industrial areas).

During Station construction, Best Management Practices (BMPs) to control erosion and sedimentation will be employed.

During Station operation, erosion and sedimentation BMPs will control runoff from parking surfaces and possibly areas where plant equipment could come in contact with precipitation and could add low concentrations of dissolved petroleum hydrocarbons, metals, and possibly other substances to the runoff in the local washes. Runoff from the access road could also contribute low concentrations of similar dissolved substances to the flows of local washes, and runoff from the rail spur could similarly contribute low concentrations of these substances to Duck Creek. In addition, the design of the rail spur and the operation of the trains on the spur would avoid having rail cars parked on the bridge over Duck Creek. These actions would minimize the potential for contaminant releases to Duck Creek from the rail spur.

With the implementation of Station design features described in Chapter 2 and commitments in Appendix A, *Best Management Practices*, no impacts to surface water quality are anticipated from the utilities that link the wellfield to the power plant site, or from the development and operation of the wellfield. Accordingly, under normal operational practices of the proposed Station, the potential resulting concentrations in the receiving water bodies would not be elevated to levels that would constitute an environmental impact.

4.3.1.3.2 Mitigation

No mitigation is required for the Proposed Action.

4.3.2 Alternative 1

4.3.2.1 Potential for Flooding

4.3.2.1.1 Impacts

The proposed location of the Alternative 1 power plant also is within a Zone D flood area (undetermined flood hazards as designated by the Federal Emergency Management Agency), the same as the Proposed Action. The potential for Station-related flooding and impacts at the Alternative 1 power plant site, along linear features, and in the wellfield is the same as described for the Proposed Action in Section 4.3.1.1. Although the rail spur would not cross mainstem Duck Creek under Alternative 1, the same kinds of support features as described for the Proposed Action would be constructed, where needed, to cross tributary drainages and adjacent wetlands, thus allowing flood water to flow past the rail spur and avoid environmental impacts.

4.3.2.1.2 Mitigation

No mitigation is required for Alternative 1.

4.3.2.2 Potential for Surface Water Features to Be Affected as a Result of Station-Induced Ground Water Level Declines

This is discussed in Section 4.4, *Ground Water Resources*.

4.3.2.3 Potential for Surface Water Quality Degradation

4.3.2.3.1 Impacts

Potential Station-related effects on surface water quality under Alternative 1 are the same as described for the Proposed Action. Because the rail spur would not cross Duck Creek under Alternative 1, there is no potential for the accidental release of contaminants from rail cars to this drainage except where the rail spur crosses tributary waters.

Alternative 1 also includes a Class III solid waste disposal facility and an evaporation pond with the same levels of environmental protection as described under the Proposed Action.

With the implementation of commitments in Appendix A, *Best Management Practices*, no impacts to surface water quality are anticipated from the utilities that link the wellfield to the power plant site, or from the development and operation of the wellfield.

4.3.2.3.2 Mitigation

No mitigation is required for Alternative 1.

4.3.3 Connected Actions

4.3.3.1 SWIP

Major water resources concerns were to avoid or minimize potential impacts from increased sedimentation caused by soil disturbance and channel alteration during construction, and from sedimentation, construction, maintenance, safety, and tower stability problems in areas susceptible to flooding (BLM, 1993). Areas of greatest potential concern are perennial streams and lakes, intermittent streams in steep to moderately steep terrain, and springs and swamps in or near the SWIP corridor. By implementing proposed mitigation measures (primarily spanning and avoiding sensitive features and areas like these), there would be few to no potential impacts to surface water resources in Nevada and Idaho from SWIP construction and maintenance (BLM, 1993). The potential for flooding was identified along the SWIP corridor north of the White Pine Energy Station project area near the boundary of White Pine County and Elko County. However, no specific areas of surface water resources concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line (BLM, 1993).

4.3.3.2 NNR

No adverse impacts to hydrology are expected, but there may be minor benefits. NNR rehabilitation and operation would not result in an increase in impervious areas or greater runoff (David Evans and Associates, Inc., 2002). CRS and MSC (2005) reported that many of the drainage crossings appear to be functional but most of these would need to be cleaned, maintained, repaired, or upgraded to meet current railroad standards because they have silted in, deteriorated, or collapsed. CRS and MSC (2005) suggested some drainage benefits could be achieved during NNR rehabilitation by constructing drainage swales on each side of the railroad to convey water away from the rail bed and into culverts at low points. In addition, new culverts should be installed to help convey water from one side of the track to the other in areas where the railroad bed currently acts as a dam and can erode and fail (CRS and MSC, 2005). See Section 4.4, *Ground Water Resources*, for potential effects of the NNR Project on water demand and water quality (ground water and surface water discussed together).

4.3.4 No Action Alternative

No Station-induced environmental consequences on surface water resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.4 Ground Water Resources

This section presents the evaluation of the potential environmental consequences and identifies corresponding mitigation associated with pumping ground water from the basin-fill aquifers of Steptoe Valley to supply up to 5,000 acre-feet per year to the proposed White Pine Energy Station for 40 years. Although this demand for water would be the same for either the Station Proposed Action or Alternative 1, the demand would be met through the operation of two different well fields each consisting of eight water supply wells located in a linear configuration on the valley floor roughly parallel to U.S. 93 (see *Chapter 2, Description of Proposed Action and Alternatives*). Specifically, for the Proposed Action, the eight wells in the proposed well field would be located at intervals of between approximately 1 and 3 miles extending from the Proposed Action power plant location northward for approximately 12 miles. The eight wells in the proposed wellfield for Alternative 1 would be located at intervals of between approximately 1 and 2.5 miles extending from the Alternative 1 power plant location south for approximately 5 miles.

The following evaluation of the Station Proposed Action and Alternative 1 is presented according to the potentially affected water resource. It includes discussion of the potential Station-induced effects on ground water resources, and considers the potential Station-induced effects on other water resources (springs and surface water bodies). This section concludes with a discussion of the potential effects on ground water resources of the connected actions (SWIP and NNR Project) and the No Action Alternative.

4.4.1 Proposed Action Impacts

4.4.1.1 Decline in Ground Water Levels and Depletion of Ground Water Resources

Based on the results of an analysis of potential water level decline (drawdown), ground water levels would be lowered within Steptoe Valley as a result of 40 years of ground water pumping for the Station Proposed Action by no more than approximately 10 feet within a radius of 1 mile from a representative production well (see Figure 4.4-1). This amount of decline is within the range of historical ground water level fluctuation observed in wells in Steptoe Valley (Figure 3.4-3). This estimate of the potential decline in ground water levels is based on continuous pumping at a rate of 387 gallons per minute (gpm) at each of the eight wells in the Proposed Action well field under the conditions determined from the local aquifer testing (see Table 3.4-1, Section 3.4.2.2, *Ground Water Movement and Storage Characteristics in Steptoe Valley*). The analysis of potential declines in ground water levels is based on a computer model of ground water conditions in Steptoe Valley that is presented in Appendix H, *Numerical Model Documentation*. The ground water level declines shown in Figure 4.4-1 reflect the model simulated conditions in the aquifer between 100 and 1,000 feet below the water table (Layer 2 in the model, which represents the depths of the well screens of the Proposed Action wells), where the greatest level of ground water level decline occurred.

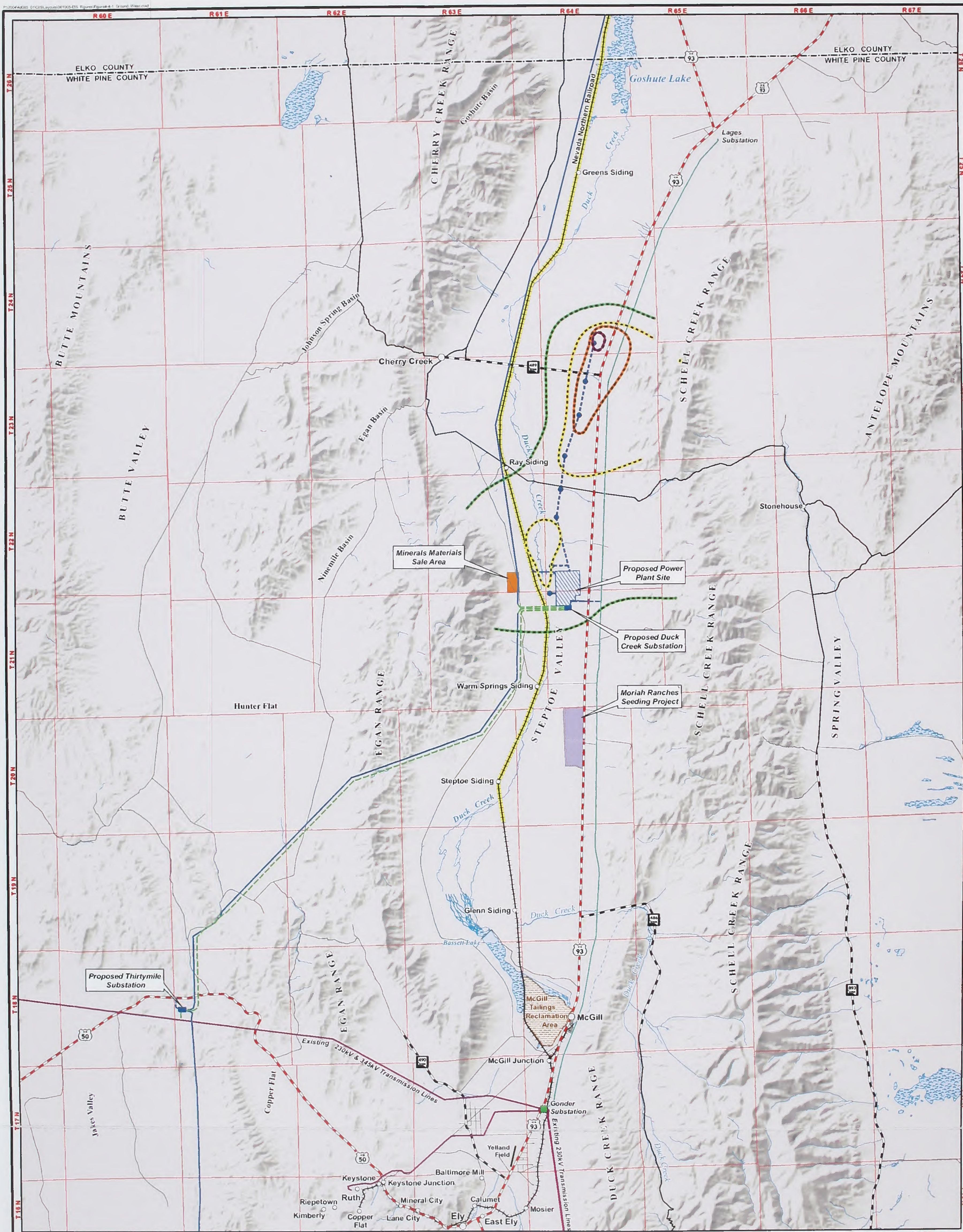
Estimates of the annual rate of ground water recharge range from 85,000 to 132,000 acre-feet, and the State of Nevada has established a value of perennial yield of 70,000 acre-feet (see Section 3.4.2.8, *Ground Water Use and Perennial Yield*). The most recent estimate of annual ground water pumping (for 2000) is 6,360 acre-feet. The Station would add 5,000 acre-feet to this amount of annual ground water withdrawal. Therefore, the total amount of annual pumping under the Proposed Action would be considerably less than the established perennial yield of the basin.

4.4.1.2 Decrease in Spring Discharge

Pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water under the Proposed Action would result in ground water level declines in the vicinity of some of the springs on the floor of Steptoe Valley. Depending on the nature of the specific affected springs, some of these features could be adversely impacted by these water level declines caused by Station pumping.

Specifically, based on the results of an analysis of potential water level decline (drawdown), 12 areas where springs have been documented to be present (BLM Ely Field Office Database) are located where ground water levels would be lowered within Steptoe Valley by at least 2, but less than 6, feet as a result of Station pumping. The analysis, which is presented in Appendix H, *Numerical Model Documentation*, is based on simulations of a ground water model developed by Frick (1985). For the purpose of this current analysis, the model was modified to enable time-dependent simulations representing 40 years of project pumping. Results of these simulations are presented in Figure 4.4-2 along with the locations of the springs that are in areas where water level declines are anticipated to be between 2 and 6 feet. These results represent the extreme case of 40 years of continuous pumping from all eight wells at the constant rate of 387 gpm per well. This rate corresponds to the maximum annual water demand of 5,000 acre-feet and assumes the instantaneous and continuous requirement of this amount of water over a 40-year period. These results are slightly different than presented in Figure 4.4-1 because the results in Figure 4.4-2 represent the ground water conditions at the water table (simulated model layer 1; see Appendix H), that best represent ground water conditions as they relate to spring discharge.

When viewing Figure 4.4-2, it is important to understand that the presence of a spring located in an area where ground water levels are anticipated to drop does not necessarily mean, in all cases, that the spring would cease to flow. Actual impacts to specific springs are a function of the mechanism(s) that create the spring and the nature of the spring discharge. In some cases, where the potentially affected spring, (1) discharges from a pronounced break in the local topography; and (2) has a relatively high discharge (greater than approximately 5 gpm), or where the discharge area has been modified to capture the discharge for a subsequent use (for example, livestock watering), these springs are less likely to be adversely affected by Station pumping. In addition, warm springs and hot springs (for example, Collar and Elbow Spring) are unlikely to be adversely affected by Station pumping because the source of water to these springs is deep circulating regional ground water. Similarly, carbonate springs that have as their source regional as opposed to local ground water are also less likely to be adversely impacted.



Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Ground Water Level Decline
- 2 Feet
- 4 Feet
- 6 Feet
- 8 Feet

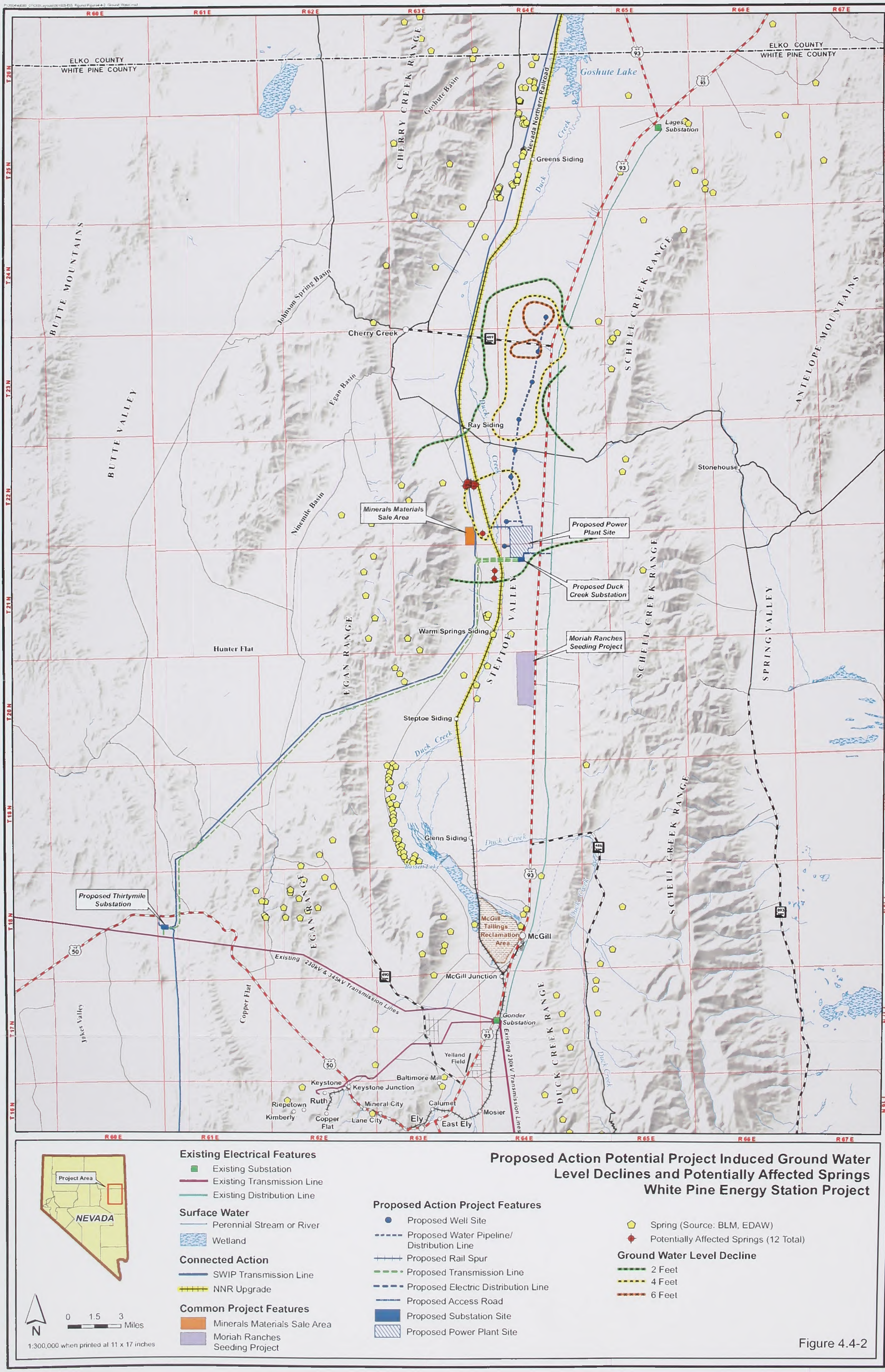
Project Area
NEVADA

0 1.5 3 Miles

1:300,000 when printed at 11 x 17 inches

Proposed Action Potential Project Induced Ground Water Level Declines
White Pine Energy Station Project

Figure 4.4-1



Proposed Action Potential Project Induced Ground Water Level Declines and Potentially Affected Springs
White Pine Energy Station Project

Figure 4.4-2

Conversely, those springs that are low-flowing ground seeps with very little discharge (less than 1 gpm), may cease to exist as a result of Station pumping, particularly during dry years. The locations of specific springs that are likely to be impacted by ground water pumping for the Station Proposed Action are shown in red on Figure 4.4-2.

4.4.1.3 Surface Water Features

No streams or creeks in Steptoe Valley would be adversely affected by ground water pumping for the Station Proposed Action. None of these features in Steptoe Valley are sustained perennially by ground water discharge under natural conditions. The principal stream in the vicinity of the Proposed Action power plant site, Duck Creek, is a losing stream in which flows progressively decrease downstream as water infiltrates through the stream bed (under natural conditions, the ground water table is below the bottom of the stream bed) (see Section 3.3.3.1, *Streams*).

Consequently, even though the results of specific analysis of potential ground water level declines caused by Station pumping (discussed above in Section 4.4.1.1) indicate that ground water level declines of more than 4 feet (but less than 6 feet) could occur beneath Duck Creek west of the Proposed Action power plant site, the flow in this reach of Duck Creek would not be adversely affected. Even though Duck Creek is a losing stream, lowering of the water table as a result of Station pumping would not adversely affect the flow in the stream because it is fed by runoff from precipitation or snowmelt.

The various local drainages and washes that cross the Proposed Action power plant site are ephemeral and, therefore, also flow only in the vicinity of these locations when runoff is sufficiently high. As a result, Station ground water pumping would not adversely impact these resources.

4.4.1.4 Existing Ground Water Permits

Under the Proposed Action, pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water would result in ground water level declines in the vicinity of some of the locations where other users have permits to pump ground water. The locations do not necessarily correspond to actual existing wells, just where a current permit to divert (to pump) has been granted by the Nevada State Engineer.

Specifically, based on the results of an analysis of potential water level decline (drawdown), five pumping permits are located in areas where ground water levels would be lowered within Steptoe Valley by between approximately 4 and 8 feet as a result of Station pumping. The only permits that would be affected by more than 8 feet are those associated with the wells for the Proposed Action. The analysis, which is presented in Appendix H, *Numerical Model Documentation*, is based on current simulations of a ground water model developed by Frick (1985) and updated for this study. For the purpose of this current analysis, the model was modified to enable time-dependent simulations representing 40 years of Station pumping. Results of these simulations are presented in Figure 4.4-3 along with the locations of ground water permits. These results represent the extreme case of 40 years of continuous pumping from all eight wells at the constant rate of 387 gpm per well. This rate corresponds to the maximum annual water demand of 5,000 acre-feet by the Proposed Action power plant and assumes the instantaneous and continuous requirement of this amount of water over a 40-year period.

4.4.1.5 Ground Water Quality Degradation

Ground water quality would not be degraded as a result of the Proposed Action because of Station design features and BMPs (see Appendix A, *Best Management Practices)* that would be implemented. The pumping of ground water and the resulting localized water level declines would not alter the water quality of the basin-fill aquifers in Steptoe Valley.

4.4.1.6 Land Subsidence

Based on detailed analysis of the soil conditions in Steptoe Valley basin-fill deposits, and the potential drawdown that could occur in these deposits as a result of Station pumping under the Proposed Action, the potential for land subsidence is insignificant and the corresponding potential loss of ground water storage negligible.

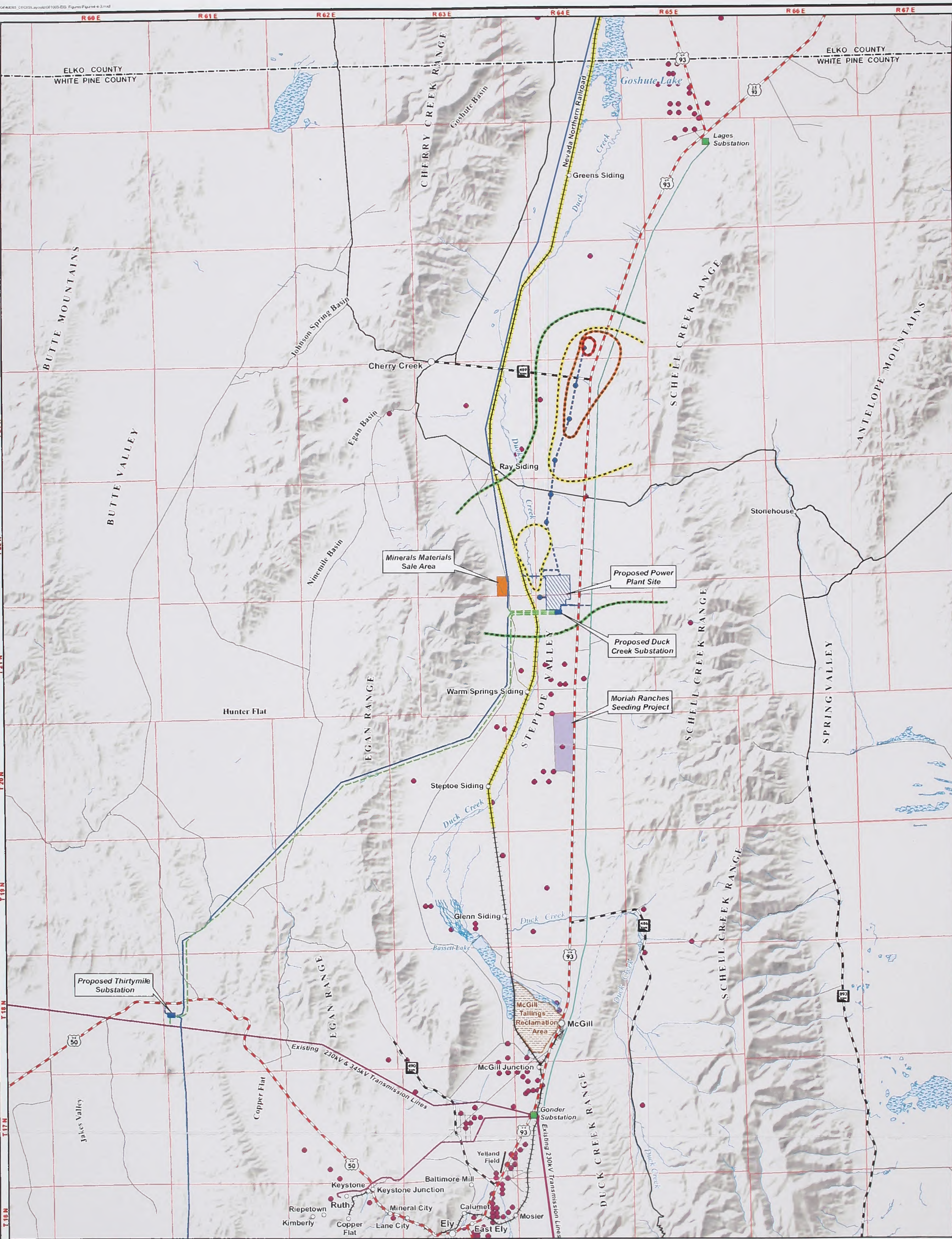
4.4.2 Proposed Action Mitigation

A ground water monitoring and reporting program will be implemented by WPEA that is consistent with the requirements of the Office of the Nevada State Engineer. Monitoring information will be used to determine if there are unanticipated effects from Station pumping on ground water levels or in flow rates and water levels of nearby springs. Ground water levels will be measured and recorded in monitoring wells located between production wells and springs. Monitoring of selected springs, including those containing potentially affected sensitive spring snail and fish species, will consist of measuring spring flow rate, spring water level, and photo-documenting general site conditions.

If the monitoring program indicates that the White Pine Energy Station is adversely affecting ground water levels or spring flow rates and water levels, and therefore may potentially affect sensitive species present in those springs, WPEA will modify their pumping strategy in the well field to mitigate the potential for impacts. One form of mitigation would involve modifications to the operation of the water supply wells to control the location and timing of, and to minimize, ground water level declines. Examples of possible changes in pumping strategy include pumping from different wells (perhaps those farthest from affected springs) and varying the amount of water being pumped from each well (reduce pumping rates nearest affected springs) in order to meet overall project needs while reducing the potential for adverse Station effects.

In addition to the above and depending on the nature of the spring and its discharge, some site-specific mitigation may be possible on a spring-by-spring basis. Specifically, those springs that have been developed and put to beneficial use may have their associated infrastructure to capture discharge modified to maintain flow (for example, through excavation to lower the point of discharge collection/diversion. This is a current practice by landowners and ranchers).

Appendix I, *Ground Water Monitoring Program* provides detail on the ground water monitoring program that would be implemented for the White Pine Energy Station.



Proposed Action Potential Project Induced Ground Water Level Declines and Locations of Groundwater Permits
White Pine Energy Station Project

Project Area
NEVADA

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Permitted Point of Groundwater Diversion

Ground Water Level Decline
- 2 Feet
- 4 Feet
- 6 Feet
- 8 Feet

N
0 1.5 3 Miles
1:300,000 when printed at 11 x 17 inches

Figure 4.4-3

4.4.3 Alternative 1 Impacts

4.4.3.1 Decline in Ground Water Levels and Depletion of Ground Water Resources

Based on the results of an analysis of potential water level decline (using the same methodology and assumptions as for the Proposed Action), ground water levels would be lowered within Steptoe Valley as a result of ground water pumping for Station Alternative 1 by no more than approximately 2 feet within a distance ranging from approximately 1 to 2 miles from a representative production well (see Figure 4.4-4). This estimate is based on Station pumping at a rate of 387 gpm under the conditions determined from the local aquifer testing (see Table 3.4-1, Section 3.4.2.2, *Ground Water Movement and Storage Characteristics in Steptoe Valley*). The analysis of potential declines in ground water levels is presented in Appendix H, *Numerical Model Documentation.*

Estimates of the annual rate of ground water recharge to the Steptoe Valley Hydrographic Area range from 85,000 to 132,000 acre-feet, and the State of Nevada has established a value of perennial yield of 70,000 acre-feet (see Section 3.4.2.7, *Ground Water Use and Perennial Yield*). The most recent estimate of annual ground water pumping within Steptoe Valley (for 2000) is 6,360 acre-feet. The Station would add 5,000 acre-feet to this amount of annual ground water withdrawal. Therefore, the total amount of annual pumping under Alternative 1 would be considerably less than the established perennial yield of the basin.

4.4.3.2 Decrease in Spring Discharge

Pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water under Alternative 1 would not result in ground water level declines in the vicinity of known springs in Steptoe Valley (see Figure 4.4-5).

4.4.3.3 Surface Water Features

No streams or creeks in Steptoe Valley would be adversely affected by ground water pumping under Alternative 1 for the same reasons as described for the Proposed Action in Section 4.4.1.3.

4.4.3.4 Existing Ground Water Permits

Under Alternative 1, pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water would result in ground water level declines of between 2 and 4 feet in the vicinity of two locations where other users have permits to pump ground water (see Figure 4.4-6). This conclusion is based on an analysis of potential water level decline (drawdown) presented in Appendix H, *Numerical Model Documentation*. Ground water level declines of 4 feet are not considered to represent a substantial adverse impact.

4.4.3.5 Ground Water Quality Degradation

Potential Station-related effects on ground water quality under Alternative 1 would be the same as described for the Proposed Action in Section 4.4.1.5.

4.4.3.6 Land Subsidence

Under Alternative 1, the potential for land subsidence is insignificant and the corresponding potential loss of ground water storage negligible for the same reasons as described for the Proposed Action.

4.4.4 Alternative 1 Mitigation

Mitigation required for ground water resources under Alternative 1 is the same as described for the Proposed Action.

4.4.5 Connected Actions

4.4.5.1 SWIP

No potential impacts to ground water resources were identified as a result of SWIP construction and maintenance in Nevada and Idaho. No specific areas of ground water resources concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line (BLM, 1993).

4.4.5.2 NNR

4.4.5.2.1 Water Demand

No new wells would be constructed, and no impacts to neighboring wells and ground water resources are expected (David Evans and Associates, Inc., 2002). No substantial impacts associated with water demand are expected (David Evans and Associates, Inc., 2002). Water requirements would be limited to water used during construction (trucked in for dust control) and in the event of fire on the NNR. No substantial consumption of water is expected, and delivery capabilities of neighboring wells would not be affected.

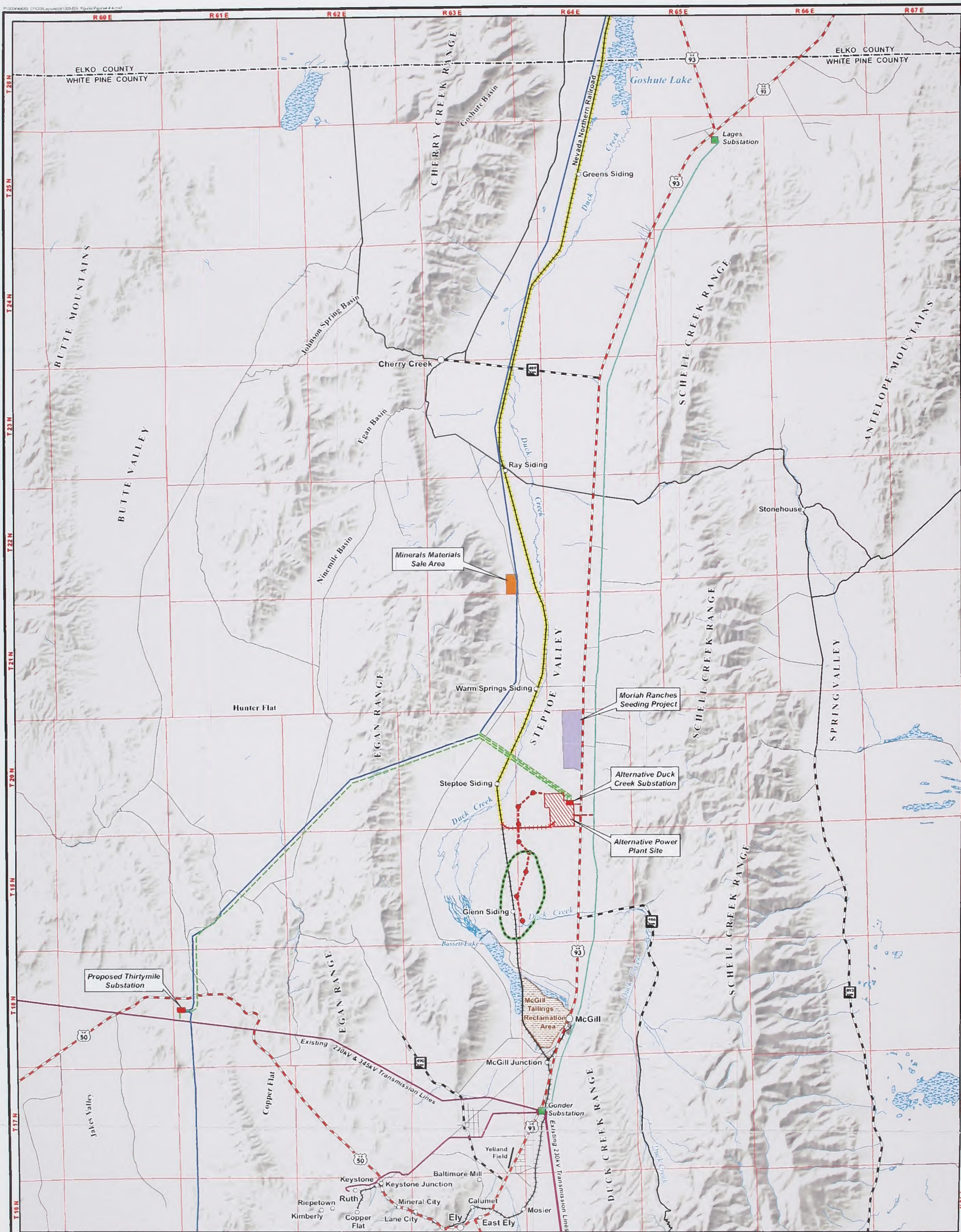
4.4.5.2.2 Water Quality

Several types of impacts on water quality could occur. Stormwater discharges from the NNR Rail Line may become contaminated if rainfall and runoff contact pollutants on exposed surfaces during NNR construction and operation (David Evans and Associates, Inc., 2002). Stormwater runoff over exposed areas such as graded land, materials storage and stockpile areas, and materials loading and unloading facilities may pick up pollutants (for example, sediment, oil and grease, hydraulic fluids, gasoline, diesel fuel) that can degrade and adversely impact surface water quality. BMPs that would be part of a Stormwater Pollution Control Permit are recommended to prevent or reduce runoff pollution. In addition, chemicals used in pest management activities along the NNR Rail Line could leach into soils and ground water, and adversely impact water quality. Implementation of an Integrated Pest Management Plan developed in coordination with the BLM was recommended to reduce the potential for chemical impacts on water quality. David Evans and Associates, Inc. (2002) also stated the above recommended measures would reduce the potential for impacts on water quality to below a level of significance.

A potential impact on water quality could occur if an NNR derailment resulted in the release of a hazardous material (for example, diesel fuel or crude oil) while being shipped on the NNR. This could cause substantially adverse impacts on water resources and on wildlife, depending on the type, amount, and location of material released. David Evans and Associates, Inc. (2002), citing results of a risk analysis presented in the Final EIS for the Robinson Mine Project, stated that the likelihood of an NNR derailment and release of a hazardous material is quite small, but it is not zero.

4.4.6 No Action Alternative

No Station-induced impacts on ground water resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.



Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

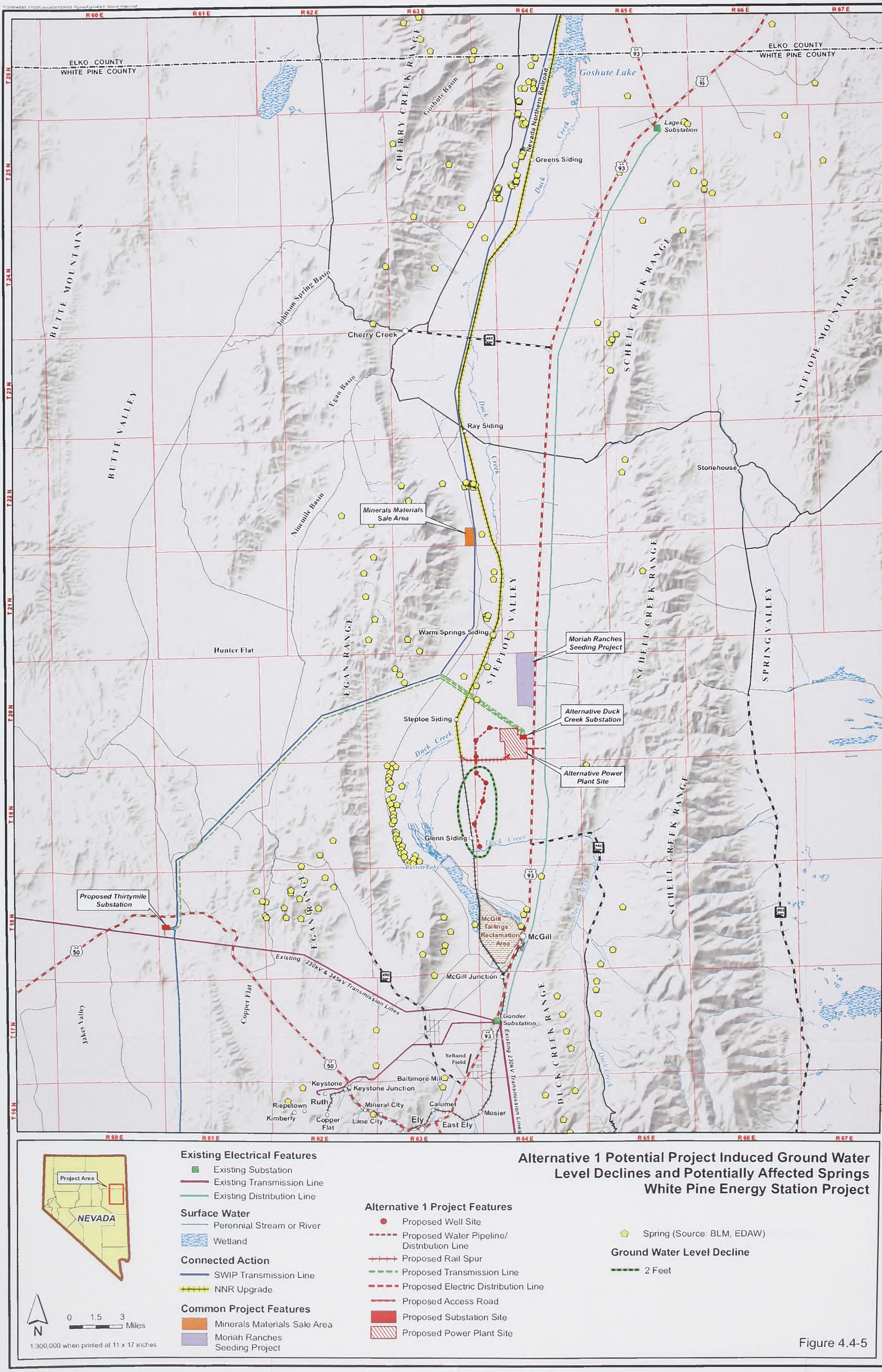
Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Ground Water Level Decline
- 2 Feet

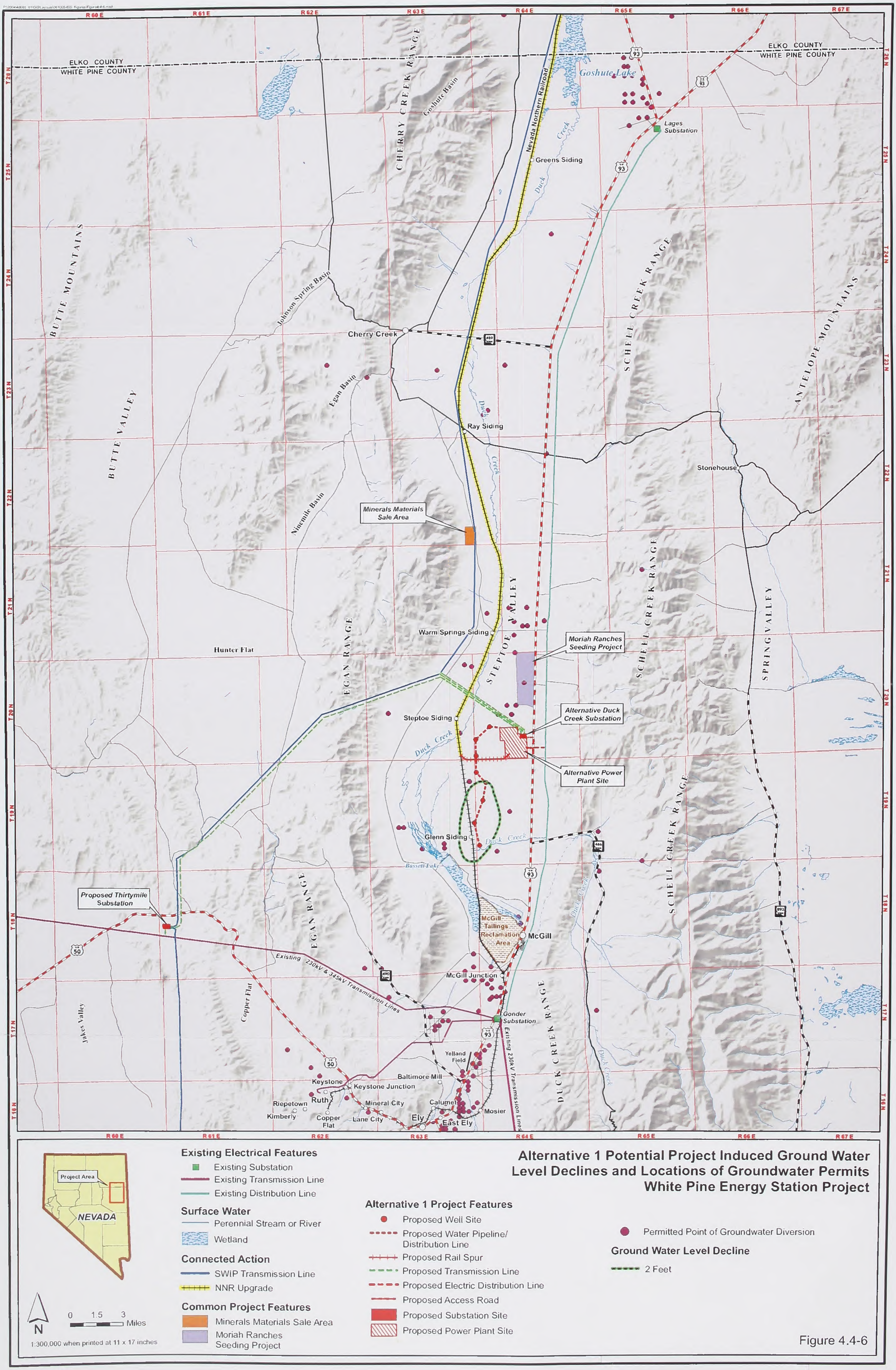
Alternative 1 Potential Project Induced Ground Water Level Declines
White Pine Energy Station Project

Figure 4.4-4



Alternative 1 Potential Project Induced Ground Water Level Declines and Potentially Affected Springs
White Pine Energy Station Project

Figure 4.4-5



Alternative 1 Potential Project Induced Ground Water Level Declines and Locations of Groundwater Permits
White Pine Energy Station Project

Figure 4.4-6

4.5 Biological Resources

4.5.1 Vegetation

This section describes the potential impacts on vegetation communities, including wetlands, that would result from implementing the White Pine Energy Station Proposed Action or Alternative 1, as described in Chapter 2, *Description of Proposed Action and Alternatives.* Discussions regarding effects of noxious and invasive weed species are provided in Section 4.5.2, *Noxious and Invasive Weeds.* Potential impacts on wildlife and aquatic resources are discussed in Section 4.5.3, *Wildlife and Fisheries Resources.* Discussions of potential impacts on special-status animal and plant species are provided in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

Potential direct and indirect effects on vegetation resources are assessed in the following text. Direct effects are those that could occur as a direct result of Station implementation, such as direct construction disturbance. Indirect effects could result from providing increased human and vehicular access to areas that currently do not have such access, increased potential for sedimentation of vegetated swales near Station features, increased risk of spreading of noxious weeds because of disturbance (see discussion in Section 4.5.2), and long-term desiccation of springs (and potential effects on associated vegetation) from ground water pumping during Station operation.

Both permanent and temporary vegetation impacts would occur. Permanent impacts would occur in construction ROWs where Station features would be built, resulting in vegetation loss. Temporary impacts to vegetation would occur during Station construction, but they would be short-term in nature or would be minimized or avoided using BMPs described in Appendix A, *Best Management Practices*). Temporary impacts would primarily include the removal or disturbance of vegetation through trampling, soil compaction, or erosion outside of a permanent ROW or Station feature footprint during construction activities.

The following factors were considered in determining an effect on vegetation resources.

- Federal or state legal protection of the resource or species
- Federal or state agency regulations and policies
- Local regulations and policies
- Uniqueness or rarity of the resource both locally and regionally
- Biological importance of the resource (for example, sagebrush communities, wetlands, and springs as wildlife habitat)
- Magnitude of the disturbance, loss, or effect
- Susceptibility of the affected resource to disturbance

Based on NEPA guidelines and the factors identified above, effects on vegetation resources were considered adverse if the Station could result in any of the following:

- Long-term degradation of a sensitive plant community because of substantial alteration of landform or site conditions (for example, alteration of wetland hydrology)
- Filling or degradation of wetlands and other waters of the United States subject to the jurisdiction of the

USACE pursuant to the federal Clean Water Act

- Substantial loss of a plant community and associated wildlife habitat
- Fragmentation or isolation of plant communities with important wildlife habitat values, especially riparian and wetland communities

4.5.1.1 Proposed Action

4.5.1.1.1 Construction Impacts

Direct permanent impacts on vegetation resources from the Station Proposed Action would occur because of construction of the power plant, substations, permanent access roads, transmission and distribution line tower footings, water supply wellfield, and rail spur. Temporary impacts would occur at locations of short-term construction access and activities. Table 4.5-1 displays estimated acres of temporary and permanent impacts of the Proposed Action on each vegetation community in the project area. Station features whose locations are still undefined at the time the DEIS was completed (access roads, pulling and tensioning sites, and staging areas) are not included in Table 4.5-1, but are discussed below in the impacts analysis.

Power Plant

Impacts to vegetation resources resulting from construction and operation of the Proposed Action power plant would be relatively larger than impacts associated with the water supply system and electric transmission and distribution lines.

Permanent impacts resulting from construction of the power plant would total approximately 1,287 acres at the power plant site and 6 acres for associated access roads. (It is important to note that GIS mapping of Station features and impact calculations may differ slightly from those numbers described in Chapter 2, *Description of Proposed action and Alternatives*, as a result of Station features being uploaded into ArcView GIS from CAD software. In addition, vegetation impacts calculations did not include access roads unless the access road(s) was included in the Station features ROW.) Vegetation communities permanently affected by power plant construction would include: Big Sagebrush Shrubland, Montane Sagebrush Shrubland, Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub and Grassland (see Figure 3.5-1). The vegetation community type that would be impacted to the greatest extent is Mixed Great Basin Shrubland (688 acres). A portion of the power plant site is already disturbed and used for gravel storage. The power plant site would directly affect eight ephemeral drainages that are dry except during peak snowmelt and major precipitation events. Additional information on impacts to drainages of potential concern to the USACE and NDEP is discussed in Section 4.3, *Surface Water Resources*.

In addition to the permanent vegetation losses, it is expected that construction would result in temporary impacts on vegetation around the perimeter of the power plant site from trampling or destruction of vegetation by construction equipment and materials storage. These temporary impacts would affect an unknown acreage of similar vegetation community types as listed for permanent impacts, primarily Sagebrush Shrubland communities. Impacts to vegetation can be reduced or avoided by landscape protection and impact avoidance measures and revegetation with appropriate native species as outlined in Appendix A, *Best Management Practices*.

TABLE 4.5-1

Proposed Action: Estimated acres of Temporary and Permanent Impacts on Vegetation Communities

Vegetation Community		Power Plant	Electric Transmission Facilities	Water Supply System	Additional Construction ROW	Rail Spur	Access ROW	Total
Big Sagebrush Shrubland	Temporary	0	56	52	4	0	0	112
	Permanent	361	12	8	0	0	0	381
Montane Sagebrush Shrubland	Temporary	0	30	1	0	0	0	31
	Permanent	29	75	0	0	0	0	104
Mixed Great Basin Shrubland	Temporary	0	9	35	3	0	0	47
	Permanent	688	47	5	0	1	0	741
Salt Desert Scrub	Temporary	0	9	2	0	0	0	11
	Permanent	59	1	1	0	2	0	63
Low Scrub and Grassland	Temporary	0	12	11	0	0	0	23
	Permanent	150	1	2	0	1	0	154
Greasewood	Temporary	0	0	0	0	0	0	0
	Permanent	0	0	0	0	0	0	0
Pinyon-Juniper Woodlands	Temporary	0	16	0	0	0	0	16
	Permanent	0	1	0	0	0	0	1
Wetlands	Temporary	0	2	0	0	0	0	2
	Permanent	0	0	0	0	4	0	4
Alkali Meadow	Temporary	0	0	0	0	0	0	0
	Permanent	0	0	0	0	0	0	0
Unknown*	Temporary	0	106	0	39	8	0	153
	Permanent	0	57	1	0	1	9	68
Total Impacts	**Temporary**	**0**	**240**	**101**	**46**	**8**	**0**	**395**
	Permanent	**1,287**	**194**	**17**	**0**	**9**	**9**	**1,516**

Electric Transmission Lines

Total temporary vegetation impacts for the 163 transmission tower footings along the Proposed Action transmission lines would be approximately 134 acres, while permanent impacts would be less than 1 acre. Permanent impacts on vegetation communities would also include approximately 56 acres for new road construction and existing road upgrade.

Based on preliminary structure placement the ROWs would cross all vegetation types, with the largest acreage in Big Sagebrush Shrubland and Montane Sagebrush Shrubland vegetation communities (see Figure 3.5-1).

Temporary impacts on vegetation communities would also include 3.3 acres for temporary access roads within the transmission ROWs. These roads would be used to access tower sites during construction. The roads would be used minimally thereafter and allowed to revegetate naturally.

Another 1.8 acres would be temporarily impacted at each pulling and tensioning site used during construction for a total of approximately 51 acres of temporary impact. The exact locations of these sites have not been determined.

More specific impacts to vegetation resources resulting from the construction of the transmission line include the following:

- Permanent vegetation loss at the transmission towers is estimated to total 0.4 acre (including 0.04 acre of potentially jurisdictional wetland near Duck Creek).
- 50 acres of vegetation permanently impacted along the 31.9-mile-long (200-foot-wide ROW) 500-kV transmission line between the Duck Creek Substation and the Thirtymile Substation. A little more than 49 acres of this impact would be the result of new road construction or existing road upgrades and about 1 acre would be from the towers.
- 6.1 acres of permanent vegetation loss resulting from new road construction along the 2.5-mile-long corridor for two parallel 500-kV transmission lines to connect the previously permitted SWIP utility corridor to the Duck Creek Substation.
- Permanent loss of 0.5 acre of vegetation from road construction related to the 0.2-mile-long corridor for two 345-kV lines to interconnect the existing Falcon to Gonder 345-kV line to the Thirtymile Substation.

Approximately 1 mile of the three parallel transmission line corridors crossing Steptoe Valley would result in approximately 0.04 acre of permanent and 0.04 acre of temporary impacts to wetlands. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span).

The portion of the transmission line that would traverse the Egan Range would result in long-term losses of juniper and pinyon trees around towers and within 55 feet of the centerline, which is needed to maintain electrical clearance. Trees over 15 feet high may need to be cut if they occur within the clearance curve between two towers. This impact is likely to be greatest along the portion of the 500-kV line that spans the Egan Range. On level terrain, shorter trees may not need to be cut near the support towers because the conductor is higher. Conversely, more trees would have to be removed or trimmed in the middle third of each span because the wire sags closer to the ground. Pinyon and juniper trees small enough not to affect transmission line operation (as determined by the growth envelope, terrain, and clearance curve between towers) would be left in place. In rough terrain, only trees at higher elevations may need to be removed.

Although 2 acres of potentially jurisdictional wetlands are located within the three proposed 200-foot-wide transmission corridors that would cross the Duck Creek floodplain (Appendix B, *Wetland Delineation*), the actual impact to wetlands would be limited to the approximately nine tower sites (three sites per corridor assuming a 900- to 1,100-foot span) that would be within the wetland. Thus, the permanent impact to potentially jurisdictional wetlands would be approximately 0.01 acre. Construction activities would also result in approximately 0.04 acre of additional temporary impacts to wetland areas. The proposed transmission lines would cross 27 drainages, including 16 that are potentially jurisdictional "waters of the United States".

Impacts on wetlands would be further minimized by incorporating the Landscape Preservation and Impact Avoidance BMPs listed in Appendix A, *Best Management Practices*, and in the mitigation measures described further below. All upland and wetland sites temporarily disturbed during Station construction would be revegetated with native plant species. Impacts to potentially jurisdictional wetlands would be mitigated in consultation with the USACE. Impacts to non-jurisdictional and jurisdictional wetlands on BLM-administered lands would also need to be assessed under Executive Order 11990, Protection of Wetlands (1977), which requires agencies to minimize impacts of federal activities on wetlands. Post-construction operation practices would include periodic visits to transmission line towers and access road maintenance. These activities may cause additional impacts on adjacent vegetation resources from disturbance, spread of invasive weeds, and erosion along the ROW. Long-term operational impacts to vegetation resources would be reduced by implementing BMPs (see Appendix A).

Substations

Sixty acres of permanent vegetation loss would occur at the proposed Duck Creek Substation, 77 acres at the proposed Thirtymile Substation, and 4 acres along a proposed gravel access road to the Thirtymile Substation.

Vegetation communities that would be most impacted would include 47 acres of Mixed Great Basin Shrubland at the proposed Duck Creek Substation and 56 acres of Montane Sagebrush Shrubland at the proposed Thirtymile Substation.

Water Supply System

Impacts to vegetation resources that may result from the construction of the proposed 13.2-mile-long water supply system, eight wells, and associated access road and staging area include the following:

- Construction of the linear water pipeline would lead to the temporary disturbance of 112 acres.
- Permanent total loss of 0.2 acre of vegetation would occur at eight ground water well sites. Temporary disturbance around well sites would total 4 acres.
- Excavation in 42 ephemeral drainages that drain the Schell Creek Range could eliminate or degrade vegetation through altered hydrology, removal, or soil compaction.
- Temporary disturbance to 2 acres of vegetation for the staging area (assumed to be located near the north end of the pipeline ROW).
- Permanent impacts to 17 acres of vegetation along an access road that would serve the water pipeline as well as the distribution line.

Following construction, the permanent ROW would be 40 feet wide. The majority of this ROW would be revegetated. Permanent impacts would be limited to 0.2 acre at well sites and 16 acres of graveled access road as described above. Temporary impacts on vegetation would be minimized by BMPs, including weed control during construction, and revegetation with approved native species once the pipeline is constructed and buried (see Appendix A, *Best Management Practices*).

The acreage of each vegetation community that would be permanently or temporarily affected by the Proposed Action water supply line is summarized in Table 4.5-1. Most of the impacts would occur in Big Sagebrush Shrublands and Mixed Great Basin Shrublands. Salt Desert Scrub, Low

Scrub and Grassland, and Montane Sagebrush Shrublands would also be impacted. The proposed water supply system would not directly affect any of the potentially jurisdictional wetlands identified in the project vicinity (Appendix B).

The Proposed Action water pipeline ROW would affect 42 drainages that drain into Steptoe Valley from the Schell Creek Range. Two of these drainages may potentially be considered jurisdictional "waters of the United States" and the other 40 drainages are of concern to the NDEP. During construction, increased erosion or sedimentation could occur along these small streambeds, especially if work is conducted during wet periods of the year. As discussed in Section 4.3, *Surface Water Resources,* the pipeline would be buried to a sufficient depth so as not to affect water flow of drainages within the valley including Duck Creek.

The Proposed Action ground water pumping could reduce discharge at springs in Steptoe Valley, which could result in long-term indirect loss of wetland vegetation at those springs. However, as described in Section 4.4, *Ground Water Resources*), ground water and spring monitoring will be conducted during Station operation and appropriate measures implemented to avoid adverse impacts. The ground water analysis (see Section 4.4, *Ground Water Resources*) describes the predicted impacts on spring hydrology and indicates the potentially affected springs are located in areas where ground water levels would be lowered by at least 2 to 4 feet, but less than 6 feet, as a result of Station ground water pumping. Most of these springs support narrow springbrooks with watercress, sedges, rushes, and other herbaceous wetland species that could be affected by reduced water availability. Predicting the exact effects of ground water withdrawal on individual springs and associated vegetation is impossible. The springs most at risk in the Steptoe Basin are those located on or near the valley bottom, whereas the springs closer to the alluvial fans of tributary washes and at higher elevations in the basin are not at risk based on hydrology modeling (see Section 4.4, *Ground Water Resources*).

Without the prescribed ground water monitoring and mitigation, if needed, ground water pumping under the Proposed Action could cause hydrophytic vegetation to be replaced over time with upland plant species because of decreased water availability. The magnitude of this change would be site-specific and dependent on the current flow rates, spring geology and water source, and species of plants. Species such as sedges and rushes that dominate virtually all of the springs in question have rooting depths that are generally less than 18 inches and are adapted to having readily available water in that zone during a significant portion, if not all, of the growing season (mid-June to mid-September). Therefore, a loss of ground water would rapidly kill existing hydrophytic plants, especially if high pumping rates coincide with drought.

Many special status plant species and invertebrate animal species are associated with the springs in the Station project area. Potential impacts on these species are discussed in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

Electric Distribution Lines

An estimated 1.3 miles of distribution lines would be constructed to supply power to the water supply wellfield. Impacts on vegetation from construction of distribution lines would include less than 0.05 acre of permanent impact for all electric pole footing locations and approximately 15 acres of permanent impact for construction and use of access roads.

Vegetation communities affected by installation of the electric distribution lines primarily include Big Sagebrush Shrubland and Mixed Great Basin Shrubland (see Table 4.5-1). Impacts from the distribution lines would be minimized using BMPs contained in Appendix A, *Best Management Practices*.

Rail Spur

The approximately 1.3-mile-long rail spur under the Proposed Action would include a permanent 70-foot-wide ROW inclusive of 9 acres. In addition to crossing the main channel of Duck Creek, the rail spur would also cross three potentially USACE jurisdictional side channels. The rail spur has been designed to cross Duck Creek via a bridge with supports that would also require placement within the wetland but not within the creek.

Approximately 9 acres of permanent impacts on vegetation would result from construction of the rail spur. Additionally, 8 or more acres of temporary impacts would result from vehicle traffic and other construction activities within the larger 100-foot-wide temporary construction ROW. Approximately 5,300 linear feet of the Proposed Action rail spur ROW would transect a wetland community along the Duck Creek floodplain that is potentially "waters of the United States". The rail spur would directly impact and permanently eliminate 4 acres of potentially jurisdictional wetland. In addition to the Wetland communities, vegetation communities that would be affected by construction of the rail spur include Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub and Grassland.

Other Project Features

An off-site borrow area would be used to supply rock and earth materials during the construction process. This borrow area would result in temporary impacts to 40 acres of vegetation. The exact location of the borrow pit would be determined through consultation with the BLM within the 320-acre area identified in Figure 2-16.

The batch plant would be active during construction and would temporarily impact approximately 3 acres of vegetation.

A temporary distribution line would be utilized to provide power during the construction of the power plant. The temporary ROW for construction power from the existing 69-kV distribution line to the power plant ROW would be 1.3 miles long and 40 feet wide. Once construction is complete the ROW would be revegetated using native vegetation.

4.5.1.1.2 Operation Impacts

During Station operation and maintenance, routine activities would increase the risk of spread of noxious and non-native invasive plant species because of increased vehicular access along the water supply system, transmission line, and distribution line (see Section 4.5.2, *Noxious and Invasive Weeds*). Maintenance could also result in minimal periodic impacts to vegetation over the life of the Station from soil disturbance along the Station facilities.

4.5.1.1.3 Mitigation

Mitigation measures for biological resources are directed primarily at wildlife habitat and wildlife resources, but they cover the range of potential effects on all biological resources addressed in the EIS. For this reason, all mitigation associated with biological resources and required for the Proposed Action is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.1.2 Alternative 1

4.5.1.2.1 Construction Impacts

The Proposed Action and Alternative 1 differ primarily in the proposed locations of the power plant site, transmission line alignment, water supply system, rail spur, and location and length of the transmission line that runs from the SWIP line into the power plant site. Potential effects of Alternative 1 on vegetation are described below and summarized in Table 4.5-2.

TABLE 4.5-2

Alternative 1: Estimated Acres of Temporary and Permanent Impacts on Vegetation Communities

Vegetation Community		Power Plant	Electric Transmission Facilities	Water Supply System	Additional Construction ROW	Rail Spur	Access ROW	Total
Big Sagebrush Shrubland	Temporary	0	45	7	5	2	0	59
	Permanent	718	66	1	0	4	0	789
Montane Sagebrush Shrubland	Temporary	0	29	2	0	1	0	32
	Permanent	23	68	1	0	3	0	95
Mixed Great Basin Shrubland	Temporary	0	13	2	0	2	0	17
	Permanent	303	1	1	0	5	0	310
Salt Desert Scrub	Temporary	0	23	8	0	2	0	33
	Permanent	24	0	1	0	5	0	30
Low Scrub and Grassland	Temporary	0	37	30	0	0.3	0	67
	Permanent	227	1	5	0	1	0	234
Greasewood	Temporary	0	0	0	0	0	0	0
	Permanent	0	0	0	0	0	0	0
Pinyon-Juniper Woodlands	Temporary	0	13	0	0	0	0	13
	Permanent	0	1	0	0	0	0	1
Wetlands	Temporary	0	11	13	0	4	0	27
	Permanent	0	0	2	0	4	0	6
Alkali Meadow	Temporary	0	1	0	0	0	0	1
	Permanent	0	0	0	0	0	0	0
Unknown*	Temporary	0	87	1	40	0	0	128
	Permanent	0	61	0	0	2	6	69
Total Impacts	**Temporary**	**0**	**259**	**63**	**45**	**11**	**0**	**378**
	Permanent	**1295**	**198**	**11**	**0**	**24**	**6**	**1534**

*Includes acreage of impact for project components whose locations have not been defined (primarily transmission line access roads, borrow area, pulling stations, etc.).

Power Plant

Vegetation communities that would be most affected at the Alternative 1 power plant site include Big Sagebrush Shrubland, Mixed Great Basin Shrubland, and Low Scrub and Grassland. Other communities affected include Salt Desert Scrub and Montane Sagebrush Shrubland. As described for the Proposed Action, direct impacts on vegetation communities would result from the construction of the power plant and associated access roads. Under Alternative 1, permanent impacts resulting from construction of the power plant would total 1,295 acres at the power plant site and 2.5 acres for the paved access road to the power plant. The Alternative 1 power plant would also directly affect six drainages, all of which are likely non-jurisdictional.

Temporary, direct impacts on vegetation would result from construction activity in the vicinity of the power plant site. Such impacts would include trampling or destruction of vegetation by construction equipment, materials storage, etc. These temporary impacts would be addressed by implementing BMPs contained in Appendix A, *Best Management Practices,* including revegetation with native species appropriate to the impacted vegetation community.

Electric Transmission Lines

Direct impacts resulting from construction-related disturbance would be similar to those described for the Proposed Action. The Alternative 1 transmission lines would span a smaller portion of Steptoe Valley because the line would cross the Egan Range and go slightly south to the Alternative 1 power plant location.

Total long-term vegetation loss for the 163 tower structures along the Alternative 1 transmission lines would be approximately 1 acre, even though temporary impacts would be up to approximately 163 acres. In order to create an estimate for potential vegetation community impacts for the Alternative 1 tower structures, tower locations were automated in GIS every 1,200 feet (average span for the lines) along the proposed transmission line and impacts around these potential tower sites were then calculated. Final tower placement would ultimately change in the field based on topography, soils, and occurrence of sensitive biological resources. Therefore, vegetation impact calculations for all transmission and distribution line structures are strictly estimates used to assess potential impacts. The actual acres of impact to vegetation communities based upon tower locations cannot be calculated until structure placement has been determined. The proposed ROWs cross all vegetation community types, with the largest acreage in Big Sagebrush Shrublands. Approximately 1 mile of the three parallel transmission line corridors crossing Steptoe Valley would result in approximately 0.03 acre of permanent and 11 acres of temporary impacts to potentially jurisdictional wetlands. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span) at this particular location.

Permanent impacts on vegetation would also include approximately 60 acres for new road construction and upgrade of existing roads.

Temporary impacts on vegetation would also include 3.6 acres for temporary access roads within the transmission corridor. These roads would be used to access tower sites during construction. The roads would be used minimally thereafter and allowed to revegetate naturally.

Another 1.8 acres would be temporarily impacted at each pulling and tensioning site used during construction for a total of approximately 57 acres of temporary impacts. The exact locations of these sites have not been determined.

More specific impacts to vegetation resources resulting from the construction of the transmission line include the following:

- Permanent impacts from the 500-kV transmission line between the Duck Creek Substation and the Thirtymile Substation would include approximately 46 acres, most from new road construction or existing road upgrades.
- 14 acres of permanent vegetation loss would result from new road construction along the transmission line corridor to connect the previously permitted SWIP utility corridor to the Duck Creek Substation.
- Loss of 0.5 acre from road construction related to the 0.2-mile-long corridor for two 345-kV lines to interconnect the existing Falcon to Gonder 345-kV line to the Thirtymile Substation.

Temporary impacts would affect vegetation in these cover types in approximately 135 up to 151 acres at the footing sites (1 acre each) during construction. Temporary impacts from trampling vegetation and short-term disturbance would include 168 acres of primarily Big Sagebrush Shrublands and Montane Sagebrush Shrublands.

Under Alternative 1, the approximately 1 mile of parallel transmission lines crossing Steptoe Valley would result in approximately 0.3 acre of permanent and 11 acres of temporary impacts to wetlands potentially under the jurisdiction of the USACE. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span) at this particular location. The proposed transmission lines would cross 20 drainages, including 15 that are potentially under USACE jurisdiction.

Areas of temporary disturbance would be restored in the same manner as described for the Proposed Action using BMPs contained in Appendix A, *Best Management Practices*.

Substations

The Alternative 1 Duck Creek Substation would permanently impact 60 acres of predominantly Big Sagebrush Shrublands. The access road to be constructed into the Duck Creek Substation would permanently impact 1.4 acres. The alternative Thirtymile Substation would permanently impact approximately 77 acres of predominantly Montane Sagebrush Shrublands and Big Sagebrush Shrublands. In addition, the access road into the Thirtymile Substation site would permanently impact 2.2 acres.

Water Supply System

General ground disturbing impacts to vegetation would be similar to those described for the Proposed Action. Along the approximately 8-mile-long water supply system, a total of 67.5 acres of vegetation could potentially be temporarily impacted within the 70-foot-wide construction ROW. Within the permanent 40-foot-wide ROW, 38.6 acres of vegetation would be temporarily disturbed before post-construction revegetation. The vegetation community type affected most by the Alternative 1 water pipeline alignment would be Low Scrub and Grassland (Table 4.5-2). The Alternative 1 water pipeline would cross a complex system of wetland swales, resulting in 8.3 and 6.2 acres of permanent and temporary impacts, respectively, to wetlands potentially under USACE jurisdiction. The Alternative 1 water pipeline ROW would affect 3 drainages, only 1 of which may potentially be considered "waters of the United States"

Temporary impacts associated with well sites for the Alternative 1 water supply system would total 4 acres, while 0.2 acre of permanent impacts would occur. The staging area for construction of the Alternative 1 water supply system would temporarily impact 2 acres of vegetation.

Electric Distribution Lines

An estimated 1 mile of distribution line would be constructed to supply power to the water supply well field. Impacts on vegetation from construction of distribution lines would include less than negligible permanent impact for all electric pole footing locations and approximately 5 acres of short-term impact for construction and use of temporary access roads.

Vegetation communities affected by installation of the electric distribution lines primarily include Big Sagebrush Shrubland. Impacts from the distribution lines would be minimized by using BMPs contained in Appendix A (for example, see *Landscape Protection and Impact Avoidance Measures*).

Rail Spur

Construction of the rail spur from the NNR to the Alternative 1 power plant site would permanently impact approximately 24 acres of vegetation, including 4 acres of wetlands along 5,010 feet of ROW. Temporary impacts would result from vehicles and human activity during construction activities. In addition to wetlands, all other vegetation communities would be affected by construction of the rail spur with the exception of the Greasewood and Pinyon-Juniper Woodland communities. The rail spur would not cross Duck Creek under Alternative 1; however, it would parallel Duck Creek. The Alternative 1 rail spur would result in approximately 4 and 3.5 acres of permanent and temporary impacts to wetlands potentially under USACE jurisdiction, respectively. The Alternative 1 rail spur would cross two potentially jurisdictional drainages.

Other Project Features

The same off-site borrow area described for the Proposed Action would be used to supply rock and earth materials during the construction process for Alternative 1. This borrow area would result in temporary impacts to 40 acres of vegetation. The exact location of the borrow pit will be determined through consultation with the BLM within the 320-acre area identified in Figure 2-16.

The batch plant would be active during construction and would temporarily impact approximately 3 acres of vegetation.

A temporary distribution line would be utilized to provide power during the construction of the Alternative 1 power plant. The temporary ROW for construction power from the existing 69-kV distribution line to the power plant ROW would be 1.3 miles long and 40 feet wide. Once construction is complete the ROW would be revegetated using native vegetation.

4.5.1.2.2 Operation Impacts

During Station operation and maintenance, routine activities would increase the risk of spread of noxious and non-native invasive plant species because of increased vehicular access along the water supply system, transmission line, and distribution line (see Section 4.5.2, *Noxious and Invasive Weeds*). Maintenance could also result in minimal periodic impacts to vegetation over the life of the Station from soil disturbance along the Station facilities.

4.5.1.2.3 Mitigation

All mitigation associated with biological resources and required for Alternative 1 is the same as for the Proposed Action and is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.1.3 Connected Actions

4.5.1.3.1 SWIP

Potential direct and indirect impacts to vegetation and plant species of concern from SWIP construction and maintenance are summarized in the following text. Examples of proposed mitigation measures for the SWIP include avoiding or spanning sensitive areas, minimizing ground disturbance during construction, and using existing access roads during construction and maintenance (BLM, 1993).

Direct Impacts

Construction and maintenance of the SWIP would include ground disturbing activities that directly impact plants. The greatest impact would be the loss of vegetation and habitat from the construction of tower bases, access roads, spur roads, and substations (BLM, 1993). Plant populations that occur on or near the centerline where towers are constructed may be damaged or eliminated as habitat is dug up or destroyed during construction activities. Many of these effects would be permanent (BLM, 1993). Plant populations occurring near construction areas would likely be subject to trampling, but they may recover depending on the magnitude and extent of disturbance. Destruction of vegetation also may result in future habitat loss because of erosion unless some site rehabilitation occurs (BLM, 1993).

Ground disturbance may potentially have adverse effects on sensitive plants. Within the SWIP corridor in Nevada, the potential for direct impacts to sensitive plant species following the implementation of mitigation measures is greatest for threecorner milkvetch (*Astragalus triquetrus)*, two-tone beardtongue (*Penstomen bicolor* var. *bicolor* and *P. bicolor* var. *roseus)*, and Monte Neva paintbrush (*Castilleja salsuginosa)* (BLM, 1993). None of these species are reported to occur in the White Pine Energy Station project area. However, *C. Salsuginosa* (a FWS species of concern, BLM-Sensitive species, and state critically endangered species) has been reported to occur near the Monte Neva Hot Springs (BLM, 1993), which is west of the Station Proposed Action power plant site (BLM, 1993).

Indirect Impacts

Increased public access associated with the construction and maintenance of the SWIP would result in more opportunities for human activity and indirect impacts to plants in these areas (BLM, 1993). This would be especially true where no access existed before, and could result in increased disturbance and mortality of sensitive plant populations over the long term. Examples include increased collecting and trampling of sensitive plants and, in pinyon-juniper communities, harvesting a greater number of trees for use at Christmas and as firewood (BLM, 1993). Within the SWIP corridor in

Nevada, there could be indirect impacts to sensitive plant species, including *A. triquetrus*, *P. bicolor* var. *bicolor*, *P. bicolor* var. *roseus*, and sunnyside green gentia (*Frasera gypsicola)* (BLM, 1993). Only *F. gypsicola* (a FWS species of concern, BLM-Sensitive species, and state critically endangered species) has been reported to occur in the White Pine Energy Station project area.

4.5.1.3.2 NNR

Existing vegetation near the NNR tracks would be removed to permit train operation, and chemical treatments would be used to retard future vegetation growth (David Evans and Associates, Inc., 2002). Many areas of track between mileposts 55 and 115 are overgrown with sagebrush and other native vegetation because ballast is non-existent in much of this section, which now lies at or below natural grade (CRS and MSC, 2005). Removal of scrub vegetation along the NNR is not expected to substantially impact biological resources because of abundant vegetation in the surrounding area (David Evans and Associates, Inc., 2002). David Evans and Associates, Inc. (2002) reported that no federally sensitive plant species are known to occur in the NNR Rail Line. David Evans and Associates, Inc. (2002) stated that implementation of an Integrated Pest Management Plan, developed collaboratively with the BLM, would minimize the potential for impacts to wetlands and riparian resources during chemical treatment of weeds. There is the potential for rail-caused fires, which could adversely affect biological resources in the area. Recommended measures to reduce the likelihood of fires include using spark arrestors on locomotive exhaust stacks, using low-spark brake shoes, having fire extinguishers available, and complying with "Track Safety Standards" of the Federal Railroad Administration (David Evans and Associates, Inc., 2002).

CRS and MSC (2005) identified and mapped wet and heavily vegetated areas between NNR mileposts 18.5 and 115. In areas of standing water and saturated soil conditions, work would be performed "on-track" to the maximum extent possible to avoid or minimize potential impacts (CRS and MSC, 2005). Rehabilitation in these areas would include raising the track and placing ballast material to increase track elevation and provide adequate track shoulder for separation from adjacent wet areas. To the maximum degree possible, rehabilitation and restoration work in these areas would be performed with on-track equipment. Preliminary estimates indicate a total of 2 to 7 acres of wet or vegetated areas within the NNR Rail Line would be permanently impacted from widening the NNR roadbed (CRS and MSC, 2005). Any surface disturbance to lands within the NNR Rail Line (except at culverts and drainage channels) would be restored to allow the regrowth of native vegetation after NNR restoration is complete. Farther south, approximately 0.25 mile of wetlands along the NNR within the NNR Rail Line near milepost 123 could be affected by placement of ballast to stabilize the track. This wetland is south of the railroad spur sites for the Station Proposed Action (milepost 103) and Station Alternative 1 (milepost 115) (David Evans and Associates, Inc., 2002).

4.5.1.4 No Action Alternative

No Station-related impacts on vegetation resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.5.2 Noxious and Invasive Weeds

Noxious and invasive weed species create negative impacts on landscapes by displacing native plants, reducing biodiversity, affecting threatened and endangered species, altering normal ecological processes, decreasing wildlife habitat, reducing the recreational value of an area, and increasing soil erosion and stream sedimentation (Sheley et al., 2001).

Impacts would be considered adverse for noxious and invasive weeds if they result in any of the following effects:

- A reduction in native plant community cover, structure, and composition
- Degradation of wildlife habitats and habitats for sensitive plant species
- Reduction in range forage quality
- Alteration of soil structure and function
- The presence of weedy annuals may prevent establishment of desirable perennial grasses and may increase future fire hazards (Bunting, 1990)

Potential impacts related to noxious and invasive weeds are described in this section. Adverse impacts associated with noxious and invasive species would affect resources such as native vegetation and wildlife habitat, not the weeds themselves. A formal weed risk assessment was completed in 2006. Detail on the location and density of noxious and invasive weed species in the project area is provided in the BLM Noxious and Invasive Weed Risk Assessment, which is contained in (Appendix C, *Biological Resources Supplemental Information*). BMPs associated with noxious and invasive weeds would be implemented as an integral part of the proposed Station and are contained in Appendix A, *Best Management Practices,* under the heading *Noxious and Invasive Weed Management.*

4.5.2.1 Proposed Action

4.5.2.1.1 Construction Impacts

The noxious weed species, hoary cress, could potentially spread because of Station construction near the distribution line east of U.S. 93. This species could also spread in other areas from populations along existing roads that run through the Proposed Action power plant site. Sulphur cinquefoil could spread from construction along the transmission line corridor. Musk thistle was the only other noxious species that was found during field investigations (along roads outside of the Station project area), and could be inadvertently introduced into the Station project area during the transport and construction of Station facilities and structures. Risk from increased populations of invasive species would apply to all Station features. Table 4.5-3 lists weed densities at the sites of Proposed Action features.

Power Plant

Construction of the Proposed Action power plant could potentially cause the spread of existing invasive species' populations, including cheatgrass and flixweed. Access roads would be the main concern because of the potential for vehicles to transport weed species throughout this and other nearby areas (for example, the proposed water supply system). The proximity of these two Station Proposed Action features could introduce weed species located along one feature to the other feature once construction begins.

The Proposed Action power plant site contained fewer weed species and lower weed densities in 2005 than the Alternative 1 power plant site.

TABLE 4.5-3

Weed Densities for the White Pine Energy Station Proposed Action and Alternative 1 Sites

Scientific Name	Common Name	Noxious or Invasive	Transmission Lines ROW	Water Supply System ROW	Rail Spur ROW	Power Plant Site
Proposed Action						
Cardaria draba	Hoary Cress	Noxious	—	—	-	-
Bromus tectorum	Cheatgrass	Invasive	Moderate	High	Low to Moderate	High
Descurainia sophia	Flixweed	Invasive	Moderate	Moderate	Low	Moderate
Sisymbrium altissimum	Tumble mustard	Invasive	—	Moderate to High	—	—
Salsola iberica	Russian thistle	Invasive	Moderate to High	High	—	—
Halogeton glomeratus	Halogeton	Invasive	High	Low to Moderate	Moderate	—
Lepidium perfoliatum	Pepperweed	Invasive	Low	—	—	—
Ranunculus testiculatus	Bur buttercup	Invasive	Moderate to High	—	—	—
Convolvulus arvensis	Field bindweed	Invasive	—	—	—	—
Kochia scoparia	American kochia	Invasive	—	—	Low to Moderate	—
Potentilla recta	Sulphur cinquefoil	Noxious	Low	—	—	—
Taraxacum officinale	Common dandelion	Invasive	Low to Moderate	—	—	—
Lactuca serriola	Prickly lettuce	Invasive	—	Low	—	—
Alternative 1						
Cardaria draba	Hoary Cress	Noxious	—	—	Moderate	High
Bromus tectorum	Cheatgrass	Invasive	Moderate	Low to Moderate	High	High
Descurainia sophia	Flixweed	Invasive	Moderate	High	—	High
Sisymbrium altissimum	Tumble mustard	Invasive	—	Low to Moderate	—	—
Salsola iberica	Russian thistle	Invasive	Moderate to High	Moderate	—	—
Halogeton glomeratus	Halogeton	Invasive	High	Low to Moderate	—	—

TABLE 4.5-3

Weed Densities for the White Pine Energy Station Proposed Action and Alternative 1 Sites

Scientific Name	Common Name	Noxious or Invasive	Transmission Lines ROW	Water Supply System ROW	Rail Spur ROW	Power Plant Site
Lepidium perfoliatum	Pepperweed	Invasive	Low	—	—	—
Ranunculus testiculatus	Bur buttercup	Invasive	Moderate to High	—	—	—
Convolvulus arvensis	Field bindweed	Invasive	—	—	—	—
Kochia scoparia	American kochia	Invasive	—	—		—
Potentilla recta	Sulphur cinquefoil	Noxious	Low	—	—	—
Taraxacum officinale	Common dandelion	Invasive	Low to Moderate	—	—	—
Lactuca serriola	Prickly lettuce	Invasive	—	—	—	—

Electric Transmission Lines and Substations

Construction of the Proposed Action transmission line and substation could potentially impact vegetation communities and wildlife habitat through the spread of invasive plant species. Seven invasive species found within the proposed transmission line ROW, particularly halogeton, cheatgrass, and Russian thistle, are the species most likely to be spread by construction of the transmission line and substations. Sulphur cinquefoil is the only noxious species found along the Proposed Action transmission line ROW. Musk thistle was seen in Butte Valley along County Road 19. This species may be spread during construction and operation of the transmission line.

Water Supply System

Six species of invasive weeds were documented along the Proposed Action water pipeline ROW. The increased spread of these species, including cheatgrass, halogeton, and flixweed, could potentially impact vegetation communities along the pipeline. BMPs described in Appendix A, *Best Management Practices*, are directed at minimizing the spread of weeds and degradation of such areas.

Electric Distribution Lines

Weeds found in the Proposed Action temporary distribution line ROW include hoary cress, cheatgrass, flixweed, Russian thistle, and halogeton. Infestations vary from light to heavy and could increase with construction of the distribution line. Weeds found along the proposed distribution lines route running to the well fields along the water pipeline are similar to those described under the water supply system since they occur in the same area.

Rail Spur

Invasive species present in the Proposed Action rail spur ROW include cheatgrass, halogeten, flixweed, and American kochia. These populations had low to moderate densities in summer 2005. Wetland communities in this area are relatively free of weeds. The Proposed Action rail spur ROW contains more weed species and a higher average density of invasive species than the Alternative 1 rail spur ROW.

4.5.2.1.2 Operation Impacts

Ongoing maintenance of Station features may increase the spread of noxious weeds in the Station project area. Implementation of BMPs listed in Appendix A, such as cleaning vehicles upon entering and leaving the Station project area, would help to minimize the potential for these impacts.

4.5.2.1.3 Mitigation

No mitigation is required for the Proposed Action.

4.5.2.2 Alternative 1

4.5.2.2.1 Construction Impacts

The Station Proposed Action and Alternative 1 differ primarily in the proposed locations of the power plant site, transmission line alignment, water supply system, and rail spur. Under Alternative 1, types of weed-related impacts from construction of the water supply system and electric distribution system would generally be similar to those for the Proposed Action. Potential impacts from noxious and invasive weeds at the Alternative 1 power plant, transmission line, and rail spur sites would vary based on the potential for the different weed populations to spread. Table 4.5-3 lists weed densities at the sites of Alternative 1 features.

Power Plant

Weeds present on the Alternative 1 power plant site include dense patches of the noxious hoary cress and the dominant invasives—cheatgrass and flixweed. Construction of the power plant could have potential adverse impacts caused by the spread of these weed species to surrounding areas, including access roads. The Alternative 1 power plant site contained a greater number and higher density of noxious and invasive species than the Proposed Action power plant site.

Electric Transmission Lines and Substations

Construction of the transmission line could result in the spread of existing invasive and noxious weed species populations. These include halogeton, cheatgrass, and Russian thistle, all invasive species that are found in heavy patches in some previously disturbed areas. Sulphur cinquefoil is found in the portion of the proposed transmission line ROW that spans the Egan Range.

Water Supply System

The proposed Alternative 1 alignment of the water supply system had fewer occurrences and a lower density of invasive weeds than the Proposed Action water supply alignment. No noxious weeds were observed in either proposed water supply alignment. These areas would be of particular concern during construction of the water pipeline, wellfield, and associated access roads. In areas such as these, which have little to no invasive weed infestations, the Station-induced loss or degradation of native vegetation resources resulting from vegetation removal, soil compaction, and exposure to weed infestations could be substantial.

Rail Spur

The Alternative 1 rail spur ROW contained fewer weed species and lower average weed densities than the Proposed Action rail spur ROW. Construction of the rail spur under Alternative 1 could potentially spread existing infestations of hoary cress, together with cheatgrass that currently exists throughout the area.

4.5.2.2.2 Operational Impacts

Minimal weed-related impacts from Station operation could continue to affect vegetation communities once Station construction and appropriate reclamation is complete.

4.5.2.2.3 Mitigation

No mitigation is required for Alternative 1.

4.5.2.3 Connected Actions

4.5.2.3.1 SWIP

The SWIP Final EIS impact analysis did not specifically address noxious and invasive weeds, but it did note the presence of exotic plant species in the SWIP project area. Construction of the SWIP would increase the risk of spread of invasive weed species.

4.5.2.3.2 NNR

See Section 4.5.1, *Vegetation,* regarding noxious weeds, treatment, and potential effects of the NNR.

4.5.2.4 No Action Alternative

The No Action Alternative would not result in any Station-related impacts from noxious or invasive weed species. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.5.3 Wildlife and Fisheries Resources

The following sections describe anticipated direct and indirect impacts to general wildlife and fisheries resources within the Station project area. Construction and operation of Station facilities for the Proposed Action and Alternative 1 as described in Chapter 2 could result in direct, indirect, temporary, and permanent disturbances to common wildlife and wildlife habitat. Direct impacts are those impacts that result from the proposed Station and occur at the same time and place. Potential direct impacts on wildlife include the following:

- Long-term (permanent) and short-term removal of habitat
- Direct sedimentation or contamination of Duck Creek or other aquatic habitats
- Removal of ground-dwelling wildlife that are not highly mobile
- Increased human disturbance activities, structural features, and noise levels at Station locations

Potential indirect impacts occur later in time throughout the Station operational phase and may include the following:

- Degradation of wildlife habitat because of introduction of noxious/invasive weed species
- Habitat fragmentation and the loss of wildlife movement corridors
- Elevation of towers could result in aerial and ground habitat fragmentation and avoidance of the Station project area
- Impacts to ecosystem structure and function
- Contamination of Duck Creek and associated wetland habitats
- Ground water declines reducing spring habitat quality

- Increased human disturbance and noise levels at the Station location.

Habitat fragmentation is defined as the process by which a natural landscape is broken up into small parcels of natural ecosystems, isolated from one another in a matrix of lands dominated by human activities (Saunders and Hobbs, 1991). Operation of the proposed transmission lines could create aerial habitat fragmentation. Transmission towers provide increased perching opportunities for raptors. Some species may avoid the area near the transmission lines because of increased predator occurrence.

The proposed Station would also lead to short- and long-term increases in human population and traffic in the Ely and McGill region that could result in increased indirect habitat loss and increased risk of collision along roadways.

Noise and human disturbance during Station construction and operation could cause mobile wildlife to disperse into adjacent areas. The altered animal density could lead to increased competition for resources like food, cover, and water, leading to reduced survival and reproduction rates, and a change in predator/prey dynamics for the life of construction. The extent of this impact would likely be greatest near the Station power plant site where most of the activity would take place. However, noise impacts may also occur at other Station features. The impacts on wildlife would vary according to the site-specific magnitude and duration of noise/disturbance activities.

Resident and migratory bird species in the Station project area are protected under the Migratory Bird Treaty Act (MBTA) of 1919. All bird species listed in the affected environment discussion in Section 3.5.3, *Wildlife and Fisheries Resources,* are protected under the MBTA as well as the migratory and resident raptors that occur or have the potential to occur in the Station project area. Although no active raptor nests were found in the Station project area during 2004-2005, there are areas of suitable habitat for migratory and resident raptors in and near the project area. As described in Appendix A, *Best Management Practices,* during the breeding season surveys would be conducted prior to Station construction to avoid impacts to all nesting avian species protected under the MBTA. Many of these species are addressed further in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

Loss of nesting habitat could lower overall productivity within the Station project area; however, it would not likely affect the viability of the overall populations in White Pine County or the areas covered under the BLM's Egan Resource Management Plan.

In general, construction and operational disturbance of wildlife would be greatest during spring-summer breeding season and fall migration, and big game wintering periods (see Figure 4.5-1).

Potential impacts to wildlife were assessed for all Station features including the transmission lines, substation sites, power plant sites, water supply systems, distribution lines, NNR spurs, upgrade of the NNR to Shafter (although a separate Environmental Assessment has been prepared by White Pine County for this connected action and is summarized later in this discussion), additional access roads, and all other ancillary features under the Station Proposed Action and Alternative 1 as described in Chapter 2. The Station features are generally similar for the Proposed Action and Alternative 1. The primary differences between the Proposed Action and Alternative 1 are related to the location of the power plant sites, the location of the water supply system and wells, and the facilities that would connect to and from the power plants.

The following analysis addresses potential impacts common to the Proposed Action and Alternative 1 and those impacts that are site- and resource-specific.

Table 4.5-1 summarized and Section 4.5.1, *Vegetation,* provided detail on the acres of vegetation community types, which represent wildlife habitat types, that would be temporarily and permanently impacted by Station construction and operation. The reader is referred to Table 4.5-1 and Section 4.5-1 for a detailed discussion of the number of acres of vegetation communities/wildlife habitat types that would be impacted. The following text broadly describes acres of impacts on wildlife habitats but focuses on the types of effects Station construction and operation would have on wildlife and their habitat.

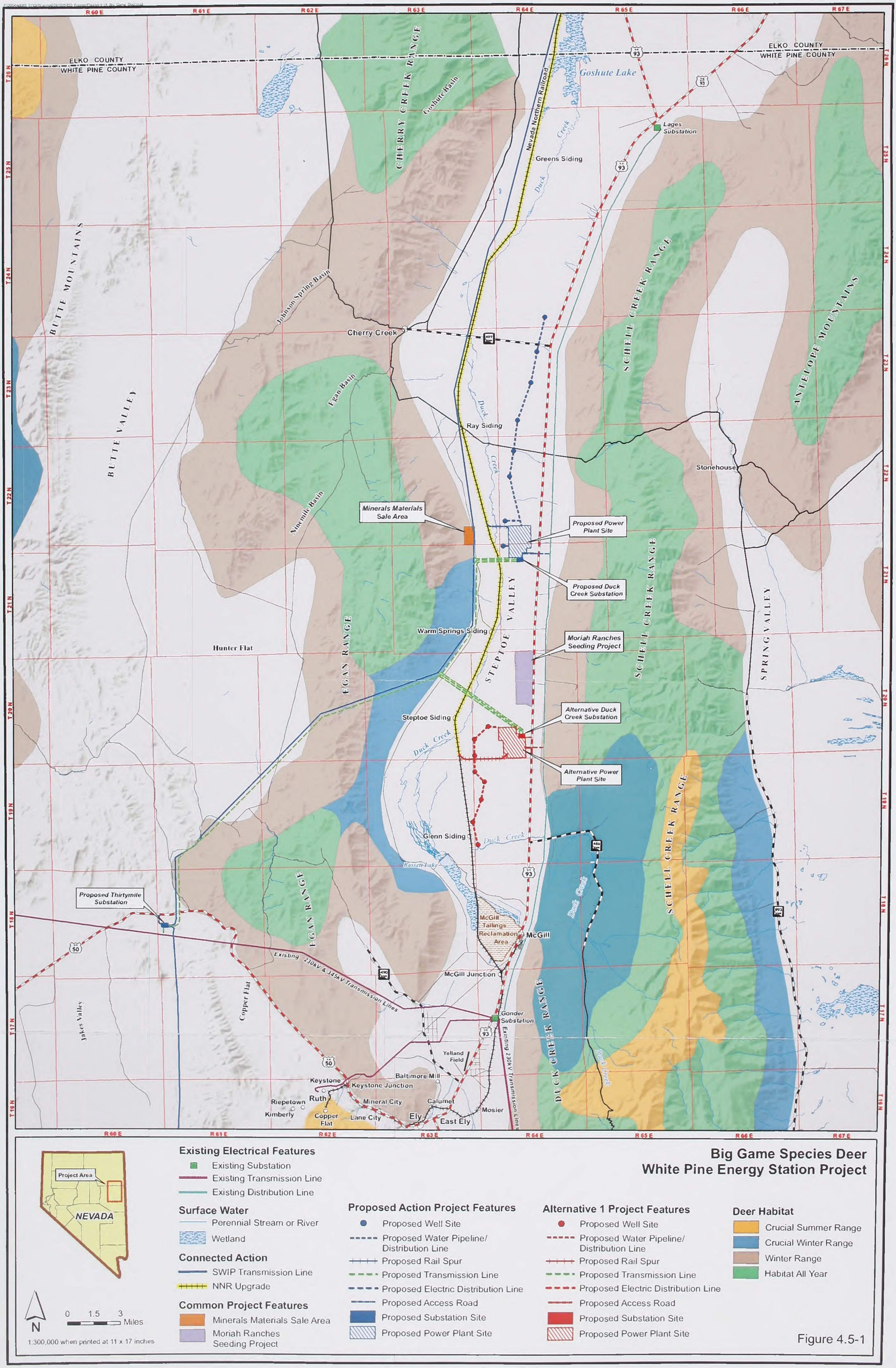
4.5.3.1 Proposed Action

4.5.3.1.1 Construction Impacts

Station construction would permanently remove vegetation/habitat in areas at transmission line and distribution line structures, and within the power plant site, at the Duck Creek and Thirtymile substations, along the water pipeline and at well sites, and at new access roads. In addition to the permanent habitat losses, additional temporary habitat disturbance would occur during the approximately 4- to 6-year Station construction period. In many areas, the temporary disturbance of wildlife habitat would last less than 1 year, except possibly near the perimeter of the Station Proposed Action power plant site where temporary disturbances would last longer. The Proposed Action (as well as Alternative 1) includes a provision to revegetate disturbed areas that are not necessary for Station operation utilizing a native species herbaceous seed mix agreed to by the BLM. This is an integral part of the proposed Station as discussed in Chapter 2 and is included in the BMPs in Appendix A, *Best Management Practices*.

The Proposed Action would permanently eliminate a total of 1,516 acres of wildlife habitat and temporarily disturb an additional 395 acres of habitat (see Table 4.5-1). By far, the most extensive impacts to wildlife habitat would be to the Sagebrush and Mixed Shrubland habitat types, which dominate the Proposed Action power plant and water supply system ROWs (see Table 4.5-1). The second most affected wildlife habitat would be the Low Scrub and Grassland type (see Table 4.5-1 for acreage of impacts). The numerous wildlife species that utilize these habitats, such as neotropical migratory birds, sage-grouse, small mammals, and reptiles such as northern desert short-horned lizards, western rattlesnakes, and sagebrush lizards, among others, could experience reduced habitat availability and quality.

Direct construction impacts would occur in emergent wetland and wet meadow communities that are potentially under the jurisdiction of the USACE (Appendix B, *Wetland Delineation Report*). The Proposed Action ROWs would involve excavation or other work in 77 drainages (Appendix B, *Wetland Delineation Report*). All but a few seasonal/intermittent channels of Schell Creek and Duck Creek are ephemeral swales or small channels that carry water only during high runoff events. Depending on when construction occurs, direct impacts could result in loss or degradation (from sedimentation) of some ephemeral aquatic habitats used by breeding amphibians, including leopard frogs that were observed in several of these types of areas.


Big Game Species Deer
White Pine Energy Station Project
Existing Electrical Features
Existing Substation
Existing Transmission Line
Existing Distribution Line
Surface Water
Perennial Stream or River
Wetland
Connected Action
SWIP Transmission Line
NNR Upgrade
Common Project Features
Minerals Materials Sale Area
Moriah Ranches Seeding Project
Proposed Action Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Alternative 1 Project Features
Proposed Well Site
Proposed Water Pipeline/ Distribution Line
Proposed Rail Spur
Proposed Transmission Line
Proposed Electric Distribution Line
Proposed Access Road
Proposed Substation Site
Proposed Power Plant Site
Deer Habitat
Crucial Summer Range
Crucial Winter Range
Winter Range
Habitat All Year
Project Area
NEVADA
N
0 1.5 3 Miles
1:300,000 when printed at 11 x 17 inches
ELKO COUNTY
WHITE PINE COUNTY
Goshute Lake
Lages Substation
Greens Siding
Nevada Northern Railroad
CHERRY CREEK RANGE
Goshute Basin
BUTTE MOUNTAINS
Johnson Spring Basin
Cherry Creek
SCHELL CREEK RANGE
ANTELOPE MOUNTAINS
Egan Basin
BUTTE VALLEY
Ray Siding
Stonehouse
Ninemile Basin
Minerals Materials Sale Area
Proposed Power Plant Site
Proposed Duck Creek Substation
STEPTOE VALLEY
SPRING VALLEY
Warm Springs Siding
Hunter Flat
EGAN RANGE
Moriah Ranches Seeding Project
Alternative Duck Creek Substation
Steptoe Siding
Duck Creek
Alternative Power Plant Site
Glenn Siding
Bassett Lake
Proposed Thirtymile Substation
McGill Tailings Reclamation Area
McGill
Existing 230kV & 345kV Transmission Lines
McGill Junction
Jakes Valley
Copper Flat
Gonder Substation
Existing 230kV Transmission Lines
DUCK CREEK RANGE
Yelland Field
Baltimore Mill
Keystone
Keystone Junction
Riepetown
Ruth
Kimberly
Copper Flat
Mineral City
Lane City
Calumet
Ely
East Ely
Mosier
Figure 4.5-1

In terms of direct habitat loss or alteration, the Proposed Action power plant site would experience the largest permanent loss of habitat (Table 4.5-1). The electric transmission lines and substations followed by the water supply system, rail spurs, and access road ROWs would also lead to substantial habitat loss on a permanent and/or temporary basis. The overall extent of electric transmission line habitat losses would depend on the exact placement of structures and access roads required for Station construction and maintenance. Temporary habitat losses would be associated with the electric distribution line and off-site borrow area (mineral materials sale area).

Wildlife that have small home ranges, are not highly mobile, or are primarily fossorial (for example, gophers, ground squirrels, moles that live underground) could be directly killed by excavation activities. Active burrows may be eliminated within the construction ROWs. If construction occurs during the avian breeding season, surveys would be conducted prior to construction to avoid the taking of active nests and to comply with the MBTA (See BMPs described in Appendix A). During Station construction, elevated noise levels are anticipated to occur, especially near the power plant site, but also near the other ROWs (see Section 4.6.2, *Noise*). The construction-related noise impacts to wildlife would depend greatly on which species are present in the specific locations, seasonal and diurnal timing of construction, construction activity and equipment, and duration of activity at each site. In most situations, the use of multiple pieces of heavy equipment at a specific site could lead to noise levels of 90 to 100 dBA (at 50 feet). Thus, wildlife within this immediate area could be exposed to potentially injurious noise levels. Under basic noise attenuation of -7.5 dBA per distance doubling ("soft site"), noise levels of 70 dBA, a level that could disturb wildlife, would occur within approximately 660 feet of the noise source. The noise disturbance in this zone could decrease wildlife survival and productivity, depending on the timing and location of the activity. Noise levels would not return to ambient levels (assumed to be 45 to 50 dBA, see Section 4.6.2, *Noise*) until approximately 5,000 feet from the noise source. However, the impact to wildlife between 660 and 5,000 feet is likely to be minimal in most cases.

Construction of the Proposed Action rail spur, water supply system, and transmission lines presents a potential risk of adversely affecting aquatic habitats from sedimentation and release of fuels and other environmental contaminants. If contamination of Duck Creek occurred, it could lead to acute and chronic impacts to waterfowl, waterbirds, fish, amphibians, reptiles, and aquatic invertebrates. The risk of contamination impacts would be minimized through implementation of BMPs including a Spill Prevention Control and Countermeasures Plan (SPCCP) as described in Appendix A, *Best Management Practices*.

Direct impacts of Station construction on coyote, mountain lion, and bobcat habitats would be largely temporary in nature and should not impact the viability of these species in the area.

The following sections briefly discuss additional construction impact analysis for specific Proposed Action project features.

Power Plant

Construction of the Proposed Action power plant would permanently eliminate 1,287 acres of wildlife habitat including Big Sagebrush Shrubland, Montane

Sagebrush Shrubland, Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub Grassland. Construction of access roads into the power plant would also permanently remove wildlife habitat. Habitat loss and alteration impacts in these areas would be most substantial for species that rely on sagebrush habitats. All habitat that would be lost in the power plant footprint is year-round range pronghorn habitat. Although communication with BLM and NDOW indicated the Proposed Action power plant site does not contain critical mule deer habitat, this species likely use this area for some of their foraging, watering, cover, and movement requirements.

The power plant site would also eliminate eight ephemeral drainages from the Schell Creek Range that could provide seasonal aquatic habitat for amphibians and other species.

Construction noise impacts to wildlife at the Proposed Action power plant site would be concentrated and produce similar noise levels as discussed previously. However, the noise would likely occur throughout most of the 4- to 6-year construction period at all times of the year, which could increase the level of impact to breeding birds, pronghorns, and mule deer.

At the end of the power plant construction period, 30 to 50 steam blowouts would take place at the power plant site (see Section 4.6.2, *Noise*). Each blow-out would produce noise levels of approximately 166 dBA (15- to 30-dBA reduction with installation of mufflers) at the site and 74 dBA at 3 miles from the site. The steam blowouts may result in disturbance of wildlife present within this zone. The level of disturbance would be highly dependent on species and time of year when the steam blowouts occur, which is undetermined at this time. In addition to disturbance, the loud noise during these events could lead to direct injury of wildlife. Assuming that approximately 92 dBA represents a reasonable threshold of noise injury to wildlife, the steam blowouts could directly injure wildlife within approximately 1.5 miles of the site (assumes 6 dBA reduction per distance doubling).

Water Supply System

Impacts to wildlife that may result from the construction of the Proposed Action 13.2-mile-long water supply system, eight wells, and associated access roads and staging area include the following:

- Permanent loss of 17 acres of wildlife habitats including Big Sagebrush Shrublands, Mixed Great Basin Shrublands, Salt Desert Scrub, and Low Scrub and Grassland as a result of water pipeline distribution lines and access road construction.
- Permanent total loss of 0.2 acre of wildlife habitat for the ground water well sites Temporary disturbance of wildlife habitat around well sites would total 4 acres.
- Excavation in 42 ephemeral drainages that drain Schell Creek Range (see Appendix B, *Wetland Delineation Report*) that, depending on the timing of construction, could eliminate or degrade through altered hydrology, vegetation removal, or soil compaction, seasonal aquatic habitat for amphibians and other wildlife.
- Temporary disturbance of 2 acres of habitat for the staging area (assumed to be located near the north end of the pipeline ROW).
- Temporary loss of approximately 112 acres of habitat along the ROW.

- Direct removal of small mammals, reptiles, and other ground dwelling, foraging, and burrowing species that are unable to avoid construction equipment.

Habitat for mule deer, pronghorn, pygmy rabbits, greater sage-grouse, black-tailed jackrabbits, and ground squirrels and other mammal, avian, insect, reptile, and amphibian species would be temporarily affected by construction of the Proposed Action pipeline. The water pipeline would be reseeded according to BMPs contained in Appendix A, *Best Management Practices,* to avoid long-term impacts to wildlife habitat.

In addition to the above, the Moriah Ranches Seeding Project would be implemented to restore 700 to 900 acres of existing pasture on public land in BLM's Ely District to better ecological condition and increase forage for livestock and wildlife. The project would be designed to create a habitat mosaic that provides cover for sage-grouse and antelope. The project would be located 16 miles north of McGill and immediately west of U.S. 93.

Because construction of the water supply system may occur during winter months in some crucial winter habitats as identified by NDOW and BLM, there could be substantial disturbance to wintering big game.

Electric Transmission Lines

Long-term habitat loss associated with the 163 tower footings along the transmission lines would be approximately 57 acres (1 acre for tower footings and 56 acres for new access roads and road upgrades). Temporary impacts to wildlife habitat associated with electric transmission lines would total 434 acres. The breakdown of what habitats would be most affected cannot be determined until structure placement has been determined. The ROWs would cross all habitat types, with the largest acreage in Big Sagebrush Shrubland and Montane Sagebrush Shrubland habitats (see Table 4.5-1).

Temporary impacts on wildlife habitat would also include 3.3 acres for temporary access roads within the transmission corridor, another 1.8 acres that would be impacted in the medium-term by pulling and tensioning sites used during construction, and 3 acres for the batch plant. The exact location of these sites has not been determined. For a summary of acreage of impact according to community type see Table 4.5-1.

Most wildlife species would avoid areas near the construction sites as crews move along the ROWs and alter movement patterns during the construction period.

The entire Station project area contains pronghorn and mule deer year-round range, which would be temporarily and permanently impacted by the construction of the Proposed Action transmission line. Construction of access roads and use of construction equipment would also lead to impacts to year-round pronghorn and deer range. Access roads left within the construction corridor for use during Station maintenance would fragment habitat, create a permanent loss of habitat, and increase the potential for human disturbance to big game and other species.

Impacts to wildlife and wildlife habitat could be further reduced by avoiding placement of structures or access roads within the 27 drainages that are bisected by one or more of the proposed transmission line ROWs.

Substations

Construction of the two Proposed Action substations would result in the permanent loss of 137 acres of wildlife habitat. An estimated 60 acres of Mixed Great Basin Shrubland, Montane Sagebrush Shrubland, and Big Sagebrush Shrubland habitat would be permanently removed at the Duck Creek Substation site. Construction of the Thirtymile Substation would result in permanent disturbance to 77 acres of Montane Sagebrush Shrubland and Big Sagebrush Shrubland habitats. In addition, 2.2 acres of these same two habitat types would be permanently removed to construct the gravel access road to the Thirtymile Substation. Mule deer likely use the area for foraging and cover.

Greater sage-grouse leks have been mapped by the BLM and NDOW approximately 4 to 4.5 miles to the west of the substation site. Direct impacts to greater sage-grouse leks are not expected in these areas. Greater sage-grouse are discussed further in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

No wetlands or drainages would be affected by the Duck Creek Substation.

Electric Distribution Lines

In all, approximately 7.4 acres of wildlife habitat would be impacted by construction of the electric distribution lines. Types of impacts associated with the distribution lines that connect to the wellfields for the Proposed Action would be similar to those described for transmission lines. The distribution line to be constructed from the existing distribution line 0.6 mile east of U.S. 93, to the power plant along the northern side of the existing dirt road that connects U.S. 93 near milepost 86.9 would be approximately 1.3 miles long and result in temporary disturbance of up to 6 acres of primarily sagebrush and already disturbed habitats.

Rail Spur

Impacts that would result from the construction of the Proposed Action rail spur include the following:

- Permanent loss of 8.5 acres of wildlife habitat, including 4 acres of wetlands that could be important for amphibians and other water-dependent wildlife (Appendix B, *Wetland Delineation Report*)
- Potential contamination of aquatic habitats and wetlands along Duck Creek if accidental spills occur

The 1.3-mile-long rail spur would connect the Proposed Action power plant site to the existing NNR, which runs along the western portion of Steptoe Valley. The rail spur would cross a large wetland complex with multiple Duck Creek channels and seasonal and permanent ponds that support local and migratory avian species, as well as potentially amphibians, reptiles, and mammals.

Although steps were taken in routing and designing the rail spur to reduce potential impacts (see Section 2.5.6, *Alternative Rail Spurs),* the rail spur would, nonetheless, be constructed within one of the least disturbed areas and within the most diverse and largest wetland complex in the Station project area. The impact to wildlife habitat from this feature could be substantial given that the wetland habitat is highly diverse and the ponds associated with these wetlands are the largest permanent to semi-permanent open water habitats available between Bassett Lake and Goshute Lake. These wetlands provide habitat for waterfowl, shorebirds, wading birds, amphibians, fish, big game, greater sage-grouse, and other avian and mammalian species. Several areas had surface water during the driest times of 2004 and 2005.

In addition to the direct removal of wetland and associated vegetation, alteration of drainage patterns and the flow of Duck Creek could reduce habitat quantity or quality for some species of wildlife. As discussed previously, the elevated noise levels during construction with machinery present could lead to wildlife avoidance.

The Proposed Action rail spur would cross and directly affect 1.3 miles of overall pronghorn range. While this area was not mapped as habitat for mule deer, the area would provide water for pronghorn, mule deer, and other large mammals that exist in the project area.

The Egan Resource Management Plan (BLM, 1984b) stresses the importance of retaining, improving, and protecting wetlands and riparian areas. NDOW also recommends protecting wetland areas as critical wildlife habitats (Crookshanks, 2005).

The connected action of White Pine County rebuilding the NNR tracks to Shafter would cause additional wildlife habitat disturbance during construction. The extent of permanent impacts to wildlife habitat would be dependent on the need for rail realignment, ROW widening, excavation/grading, access road construction, and extent of revegetation along the ROW following construction. Section 4.5.3.3.2, *NNR,* summarizes potential impacts that were described in an Environmental Assessment prepared by David Evans and Associates, Inc. (2002) for the restoration and operation of the NNR.

Access Roads

Approximately 12 miles of existing roads would be upgraded (converted to 10-foot-wide) and 35 miles of new access roads would be constructed for all Station facilities. Construction of additional access roads may result in similar types of direct and indirect impacts to wildlife as described for other Station facilities.

4.5.3.1.2 Operation Impacts

Potential long-term indirect impacts that would occur during the operation and maintenance of the Station Proposed Action are discussed in the following text.

Wildlife would continue to avoid the most heavily impacted portions of the Station project area and would need to move around the powerplant, substations, and portions of the rail spur and water supply system that have high noise from humans. vehicles, or machinery. This could affect dispersion and migration of mammal, amphibian, and reptile species. Once operational, the Proposed Action power plant would result in continued elevated noise levels at the site. However, the noise is anticipated to drop to near ambient levels very quickly (see Section 4.6.2, *Noise*) so long-term noise impacts to wildlife would not extend far from the power plant site itself. The rail spur and NNR system in Steptoe and Goshutes Valleys would experience frequent coal car train traffic, resulting in elevated noise levels and disturbance of wildlife. This effect would be limited to several hundred feet from the railroad. The disturbance could lead to increased energy expenditure, exposure to predation, reduced productivity, and increased risk of mortality from collision with the train.

Operational noise levels along the water supply system would not be elevated above ambient levels (see Section 4.6.2, *Noise*). Periodic human activity along the water pipeline could cause localized disturbance to wildlife along the water supply system and access roads. Maintenance of the water supply system and other Station facilities during the operation phase could increase disturbance, especially if conducted during the most sensitive time periods. Disturbance in areas near roads could lead to increased wildlife-vehicle collisions.

The increased vehicular traffic along the water supply system, transmission lines, and distribution lines could result in a continual risk for increased spread of noxious/invasive weeds that could reduce native grass and forb species that wildlife require for foraging and cover requirements.

At all of the Station features, the increased soil compaction and altered topography could lead to localized degradation of wildlife habitat from erosion and alteration of natural hydrology patterns in Duck Creek and the numerous drainages affected. At the Proposed Action power plant, increased impervious surface could also adversely affect the flows and water quality in nearby small drainages.

The frequent train and vehicular traffic could increase the potential risk of contamination of Duck Creek from accidental spills. This risk could be minimized by implementation of BMPs described in Appendix A, *Best Management Practices,* that are an integral part of the proposed project.

The 75-acre surface area evaporation pond operated at the power plant may attract waterfowl and other birds (collectively, avifauna). Over time, the water quality of this pond has the potential to become a threat to avifauna as well as terrestrial wildlife if they gain entrance to the pond. BMPs that would be implemented to minimize or avoid these potential risks at the evaporation pond are described in Appendix A, *Best Management Practices.* All mitigation associated with biological resources and required for the Proposed Action, including monitoring and mitigating for potential adverse effects at the evaporation pond, is discussed in Section 4.5.3.1.3, *Mitigation.*

Long-term ground water pumping is predicted to potentially reduce flow in 12 perennial springs in Steptoe Valley (Figure 4.4-2), which could adversely affect aquatic species (fish, amphibians, and invertebrates) and wildlife that rely on the springs for water sources. All 12 springs that are anticipated to experience ground water declines support relatively common species of mollusks and aquatic insects. Two of the springs predicted to be susceptible support sensitive endemic springsnails and a third sensitive springsnail population was recorded just south of the 2-foot drawdown area. There are no recorded relict dace occurrences within the predicted cone of depression. Reduced spring discharge flows caused by Station water pumping could eliminate or reduce local springsnail populations. Loss of even one spring that supports springsnails could be substantial, particularly because Steptoe Valley springs are in degraded condition and susceptible to loss of biotic diversity.

Results of hydrology modeling indicate that there would be no effects to flows or water levels in the Duck Creek channels. Operation of the rail spur could increase the risk of water quality impacts in Duck Creek. The primary fish species in Duck Creek are non-native species. Potential contamination of Duck Creek and associated wetlands if accidental spills occurred could adversely affect aquatic species. BMPs would be implemented as part of the Station and NNR operation to minimize risk of contamination (see Appendix A, *Best Management Practices*).

The site-specific characteristics of the springs in terms of flow rates, elevation, and topography, along with the uncertainty in pumping rates and interaction with annual ground water supplies, make it impossible to predict the significance of impact. Monitoring would be necessary to measure degree of effect. Monitoring/potential mitigation measures associated with sensitive aquatic resources in springs were addressed previously in Section 4.4, *Ground Water Resources*.

The long-term operation of the transmission and distribution lines could increase the risk of avian collision, especially for waterfowl and waterbirds that have a heavy wing-loading and relatively poor flying agility. The risk of bird collision would be greatest where the three parallel lines cross the Duck Creek floodplain and along the section spanning the Egan Range. The portion over Duck Creek would be most important for the waterfowl and wading birds that utilize the wetlands along the floodplain. The NNR rail spur bridge may also present a potential obstacle for flying birds, particularly waterfowl. Towers with ground guy wires could present collision hazards to ground-nesting birds such as sage-grouse (see Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*). The presence of the distribution lines may also pose a risk to avian species because of the small wire diameters.

Although collision with transmission lines is typically not a major factor for raptors because of their keen vision, risk to raptors would be greatest where the proposed transmission line would cross the Egan Range where HWI (2005) documented raptor flight-lines, particularly near the ridgelines. Risk also could be greatest for inexperienced young fledglings that have not yet honed their flight skills.

The addition of approximately 163 transmission line towers would substantially increase perching opportunities for birds and create both vertical and linear habitat fragmentation. This could be a potentially adversely affect nesting birds, including sage-grouse, small mammals, and pronghorn kids that would be subjected to increased predation from raptors and corvids. Increased predation may reduce the local populations of certain species over time. To minimize this impact, perch deterrents would be installed on all transmission lines in Steptoe Valley and Butte Valley (see Chapter 2, *Description of Proposed Action and Alternatives).*

Avian electrocution risk would increase because of the operation of the distribution lines and the substations. This is of particular concern for raptors. Electrocution is typically not a significant concern for transmission lines because of the wide spacing between electrical phases (60-inch minimum separation is recommended [Avian Power Line Interaction Committee, 1996]) (see Chapter 2 for a description of the tower configuration).

The presence of new access roads and greater human activity may lead to increased potential for poaching of wildlife, particularly pronghorn, mule deer, and other mammals. Given the additional developments planned in Steptoe Valley and surrounding areas, it is likely that over time, habitats and populations could be more adversely impacted than at present.

4.5.3.1.3 Mitigation

Five monitoring/mitigation programs have been identified for biological resources and are listed below. Because of the implementation of BMPs contained in Appendix A, no mitigation measures for vegetation, wildlife and aquatic resources, noxious weeds, or threatened, endangered, and sensitive species are anticipated to be necessary beyond those measures listed as follows:

- LS Power will contribute approximately $150,000 to a mitigation fund that will allow the BLM/NDOW to fund wildlife habitat restoration work for project-related habitat disturbances and to mitigate for project-related unavoidable adverse impacts to species. At $200 per acre (per acre habitat enhancement cost estimated by NDOW) approximately 750 acres of habitat enhancement projects could be completed with this level of funding.
- The effectiveness of perch deterrents on the electrical transmission lines associated with the water distribution system will be monitored. Based on monitoring results, design of the deterrents will be modified to minimize perching and nest building if this is not already being achieved. Nests on electrical lines associated with the water system will be removed annually, per authorization by the U. S. Fish and Wildlife Service.
- Water quality in the 75-acre evaporation pond will be tested regularly and water quality conditions monitored. Degree of pond use by waterfowl and other birds (collectively, avifauna) also will be monitored. Over time, water quality in the pond has the potential to become a threat to avifauna through increasing concentrations of total dissolved solids and salinity. Active mitigation will be initiated prior to when critical water quality levels that could adversely impact avifauna are reached. A number of mitigation techniques have been identified to keep avifauna from entering the evaporation pond. Possible mitigation techniques that would be considered to keep avifauna from entering the evaporation pond include electronic sound devices that mimic predatory bird calls, visual scare tactics, and propane noise cannons. These techniques have all been found to be successful under various conditions. Habituation can be a problem with some of these techniques. Once active mitigation is initiated, the effectiveness of the techniques used will be monitored. In the event the techniques listed above are not adequate to prevent most avian mortality, more advanced techniques, such as netting, may be employed.
- At the evaporation pond, exclusionary fencing and textured escape ramps are included in BMPs for the protection of terrestrial wildlife. The success of these exclusionary techniques will be monitored to determine if additional exclusionary mitigation is necessary to protect terrestrial species.
- Monitoring/potential mitigation measures associated with sensitive aquatic resources in springs were addressed previously under Ground Water Resources.

4.5.3.2 Alternative 1

4.5.3.2.1 Construction Impacts

General impacts on wildlife and wildlife habitat were described under the Proposed Action. Potential effects of Alternative 1 differ from the Proposed Action in terms of acreage of impact to separate wildlife habitats and specific locations of the

Station facilities. General impacts common to both the Proposed Action and Alternative 1 include the following:

- Ground-disturbing activities leading to loss of habitats and direct mortality
- Increased human presence; increased risk of avian collision
- Increased raptor and corvid predation
- Impacts on wildlife habitat from a potential increase in non-native weed species
- Habitat fragmentation

Impacts on wildlife habitat for each major and ancillary Station facility associated exclusively with Alternative 1 are described below and summarized in Table 4.5-2.

Overall, Alternative 1 would result in a permanent loss of 1,534 acres and temporary impacts to approximately 378 acres. As with the Proposed Action, most impacts would occur to the Sagebrush and Mixed Shrubland wildlife habitats. The major differences of Alternative 1 from the Proposed Action in terms of Station construction impacts are the following:

- The Alternative 1 power plant site would be farther south but the primary habitats affected would be similar.
- The rail spur would not cross Duck Creek but would cross substantially more wetland habitats but much less permanent and seasonally flooded aquatic habitats (Appendix B, *Wetland Delineation Report*).
- The water supply system would also bisect a major portion of the wet meadow habitat (Appendix B, *Wetland Delineation Report*).
- Length of transmission line ROWs

The following sections provide additional construction impact analysis for specific project features associated with Station Alternative 1.

Power Plant

Wildlife habitats permanently affected by the construction and operation of the Alternative 1 power plant include Big Sagebrush Shrubland, Mixed Great Basin Shrubland, Low Scrub and Grassland, Salt Desert Scrub, and Montane Sagebrush Shrubland. The primary habitats affected are Big Sagebrush Shrubland (718 acres), Mixed Great Basin Shrubland (303 acres), and Low Scrub and Grassland (227 acres). Critical habitat does not exist for mule deer within the Alternative 1 substation footprint. As described under the Station Proposed Action, direct impacts on wildlife and wildlife habitats would result from the construction of the power plant and associated access roads. Under Alternative 1, permanent impacts from construction would total 1,295 acres at the power plant site and 2.5 acres for the paved access road to the power plant. Construction of the Alternative 1 power plant would not directly impact wetland habitats but would affect six ephemeral drainages that could impact the availability of seasonal aquatic habitat for amphibians and other wildlife.

Medium-term to, permanent, direct, and indirect impacts would occur under Alternative 1 and would be similar to those described for the construction of the Proposed Action power plant. Similar impacts would also occur in terms of habitat loss and fragmentation.

Water Supply System

General ground-disturbing impacts to wildlife and wildlife habitat resulting from construction of the water supply system would be similar to those described under the Proposed Action. A total of 11 acres of habitat would be permanently removed during construction of the water supply system (see Table 4.5-2). The habitat type that would be affected most by the Alternative 1 water pipeline alignment is Low Scrub and Grassland. Temporary impacts associated with well sites for the alternative water supply system would total 4 acres of Big Sagebrush Shrubland, Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub and Grassland habitats. Permanent impacts associated with well sites would total 0.2 acre.

Portions of the southern water pipeline ROW would lie within wetland habitats (Appendix B, *Wetland Delineation Report*). The pipeline would directly impact 14.5 acres (8.3 acres permanently and 6.2 acres temporarily) of wetland that are potentially under the jurisdiction of the USACE that could be used by a variety of wetland-dependent wildlife species. Depending on consultation with the USACE regarding the jurisdiction determination, appropriate Clean Water Act permits would be obtained and protective measures developed. The Alternative 1 water pipeline would cross three seasonal or ephemeral drainages connected to Duck Creek as it flows out of the Schell Creek Range. Most of these washes are dry except during the wettest times of the year. However, several were found to have suitable amphibian habitat and could be adversely affected by construction of the pipeline across them.

The Alternative 1 water pipeline ROW would directly eliminate several stands of Big Sagebrush Shrubland that provide high quality habitat for a number of native wildlife species that depend on sagebrush. The pygmy rabbit, which is a BLM sensitive species, was found within this alignment (discussed further in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*). No raptor or greater sage-grouse leks were identified that would be affected by the Alternative 1 water pipeline, although that could potentially change by the time construction occurs.

Electric Transmission Line

The Alternative 1 transmission line would span a smaller portion of Steptoe Valley than the Proposed Action because the line would cross the Egan Range and go slightly south to the Alternative 1 power plant location.

Direct impacts resulting from construction-related disturbance would be similar to those described for the Proposed Action.

The final calculations for habitats impacted by construction of the Alternative 1 transmission line can not be determined until the structure locations are determined. For purposes of this analysis, structure locations were inserted every 1,200 feet using GIS software to approximate what community types would likely be affected. This information is provided in Table 4.5-1. Based on this analysis the Alternative 1 transmission line ROWs would cross all habitat types, with the largest acreage in Big Sagebrush Shrubland, Montane Sagebrush Shrubland, and Low Scrub and Grassland.

Approximately 1 mile of the three parallel transmission line corridors crossing Steptoe Valley would result in approximately 0.03 acre of permanent and 11 acres of temporary impacts to wetland wildlife habitats. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span).

Temporary impacts on wildlife habitat would also include 3.3 acres for temporary access roads within the transmission corridor, 1.8 acres that would be temporarily impacted by pulling and tensioning sites used during construction, and 3 acres for the batch plant. The exact location of these sites has not been determined.

The Alternative 1 transmission route contains overall pronghorn and mule deer habitat. Big game impacts would be similar to those described for the Proposed Action in that construction could alter movement patterns, predation risk, and productivity because of the high disturbance levels.

Substations

Permanent impacts would total 77 acres at the Thirtymile Substation, 60 acres at the Alternative 1 Substation, 1.4 acres along a gravel access road to the Alternative 1 Substation, and 2.2 acres along a gravel access road to the Thirtymile Substation.

Substation construction and operation would permanently remove approximately 60 acres of pronghorn year-round range. Mule deer also exist in this area and would sustain impacts similar to those described for the power plant sites, but the acreage would be substantially smaller.

Electric Distribution Lines

Construction of the Alternative 1 distribution lines would temporarily impact approximately 5 acres of Big Sagebrush Shrubland wildlife habitat. Types of impacts associated with construction of the distribution lines would be similar to those described previously for the Proposed Action.

Rail Spur

Construction of the rail spur to transport coal to the Alternative 1 power plant site would permanently impact 24 acres of wildlife habitat (see Table 4.5-1), including approximately 4 acres of wetland. Construction of the Alternative 1 rail spur would result in an additional 15 acres of permanent disturbance compared to the Proposed Action. The wetlands that would be impacted by the Alternative 1 rail spur are, however, less diverse than habitat present at the Proposed Action rail spur crossing. Nonetheless, the loss of wetland would reduce habitat for migratory and local avian species, big game, mammals, and amphibians that may potentially occur in these areas.

Approximately 2.8 miles of pronghorn year-round range would be permanently impacted by the construction and subsequently the operation of the Alternative 1 rail spur. Mule deer habitats have not been mapped in this area; however, the presence of wetlands in a portion of the crossing means big game and mammals of all species likely frequent the area.

Access Roads

Twelve miles of existing access roads would be upgraded (converted to 10-foot width) and approximately 31.5 miles of additional roads would be constructed for the Station Alternative 1. Construction of additional access roads may result in similar types of direct and indirect impacts to wildlife as described for other Station facilities.

4.5.3.2.2 Operation Impacts

Operation impacts of Alternative 1 would be similar to those described for the

Proposed Action except as described in the following text.

The potential for powerline structures to result in increased predation of birds, small mammals, and pronghorn kids would be similar to that described for the Proposed Action as long as perch deterrents are installed as part of the proposed Station.

The Alternative 1 water supply system would cause no ground water drawdown (greater than 2 feet) in the vicinity of any known springs in Steptoe Valley (see Section 4.4, *Ground Water Resources*). Therefore, ground water pumping that would occur under Alternative 1 would not cause operational impacts to aquatic wildlife habitat at the springs.

The Alternative 1 rail spur would result in less impact to wildlife species in Steptoe Valley than the Proposed Action, since the spur would not span Duck Creek. Although the rail spur itself would have less operational impact than the Proposed Action, it would still result in the disturbance of big game and other wildlife and potentially lead to altered movement patterns of mammals. In addition, the existing NNR crosses Duck Creek and could, therefore, affect wildlife in a similar manner as described for the Proposed Action because of coal car train traffic.

Amphibians found within the Alternative 1 project area are associated with ephemeral creeks, spring habitats, Duck Creek, and wetlands. The rail spur and water supply system pose the greatest risk of adverse impacts to amphibian habitat near intermittent and seasonal drainages south of the Alternative 1 power plant site. Potential impacts on amphibian species would be similar to those described for the Proposed Action with the exception of potential ground water declines near springs, which would not occur under Alternative 1.

Potential contamination of Duck Creek would be less likely under Alternative 1 than the Proposed Action because of the greater distance of the rail spur from Duck Creek. However, future railroad traffic on the NNR may result in risk of contamination, the same as discussed above under the Proposed Action.

4.5.3.2.3 Mitigation

Mitigation would be the same as described for the Proposed Action in Section 4.5.3.1.3, *Mitigation*.

4.5.3.3 Connected Actions

4.5.3.3.1 SWIP

The two wildlife species of primary concern in the SWIP corridor are ferruginous hawks (nest sites) and sage-grouse (leks and wintering grounds) (BLM, 1993). Other wildlife species of concern that occur on relatively few of the SWIP corridor segments are elk, bighorn sheep, and desert tortoise (in southern Nevada). There is habitat for pronghorns, mule deer, bald eagles, long-billed curlews, sandhill cranes, wild horses, and wild burros on many of the SWIP corridor segments. However, the potential for impacts to these species from SWIP construction and operation was considered to be minimal, except in those areas with specific sensitive habitats (for example, pronghorn kidding grounds, raptor nesting habitat, and key water use areas) (BLM, 1993).

Wildlife habitats of special concern occur in that portion of the SWIP corridor near the proposed White Pine Energy Station transmission line corridor. They include kidding grounds and summer and winter habitat for pronghorns along the northern half of the proposed White Pine Energy

Station transmission line corridor. Wildlife habitats of special concern along the southern half of the proposed White Pine Energy Station transmission line corridor include winter, spring, and summer habitat for mule deer; spring habitat for elk; strutting and wintering grounds for sage-grouse; and nesting sites for ferruginous hawks (BLM, 1993).

Potential direct and indirect impacts to wildlife and their habitats from the SWIP are summarized in the following text.

Direct Impacts

The greatest direct impact on terrestrial wildlife from ground disturbing activities would be the loss of habitat caused by the construction of tower bases, access roads, spur roads, and substations (BLM, 1993). These impacts may be temporary or permanent, depending on the mitigation measures employed. Impacts to wide-ranging species, such as pronghorn, generally would be indiscernible. However, smaller, ground-dwelling species such as ground-nesting birds, desert tortoises, other amphibians, mammals, and reptiles may be substantially impacted by ground disturbing activities because of the destruction of burrows and trampling by vehicles (BLM, 1993).

Another potential direct impact on wildlife from SWIP construction and maintenance activities is the disturbance and displacement of animals because of increased noise levels and human activity (workers, vehicles) in the area. These effects would generally be temporary. However, disturbance of animals in crucial habitats such as critical wintering areas for elk, raptor nesting habitat, and sage-grouse breeding grounds would represent a more substantial impact on wildlife (BLM, 1993).

SWIP construction and maintenance activities also may impact aquatic habitats and species such as relict dace and Bonneville cutthroat trout because of the displacement of soils, increased potential for erosion, and sedimentation of aquatic habitat. However, the potential for impacts to aquatic habitats was determined to be slight, assuming the necessary stipulations and mitigation measures would be implemented (BLM, 1993).

Within the SWIP corridor, and primarily in Nevada, there could be potential direct impacts to desert tortoise habitat; sage-grouse (leks, wintering grounds); pronghorn kidding grounds; key water use areas; crucial raptor nesting habitat; and elk winter/spring habitat (BLM, 1993). Mitigation measures proposed include many of the same techniques as described previously for plants, but also timing construction to avoid periods of crucial wildlife activities.

Indirect Impacts

Increased public access, particularly where none existed previously, associated with the construction and maintenance of the SWIP would result in more opportunities for human activity and indirect impacts to wildlife and their habitat in these areas (BLM, 1993). This would result in increased disturbance and mortality of wildlife over the long term. Examples include increased legal and illegal take of game species (wildlife and fish), illegal hunting and harassment of raptors, and taking of tortoises as pets. Also, increased vehicle traffic with increased public access would result in additional mortalities of wildlife, wild horses, and wild burros from collisions with vehicles on roads. Off-road vehicle use of the SWIP and its access roads may result in further destruction of wildlife habitat.

Another source of potential indirect impact is associated with SWIP transmission lines and towers. These structures would provide additional perch sites for birds of prey such as ravens and golden eagles. These perch sites may result in increased predation by ravens on juvenile tortoises, and increased predation by golden eagles on sage-grouse in the vicinity of sage-grouse leks and wintering grounds (BLM, 1993).

Within the SWIP corridor, and primarily in Nevada, BLM (1993) determined that there could be potential indirect impacts to wildlife habitats for the following: desert tortoise habitat; ferruginous hawk habitat or nests; crucial raptor nesting habitat; burrowing owl nesting habitat; bald eagle nesting habitat; pronghorns (kidding grounds, crucial summer habitat, critical habitat, and winter range); deer (winter staging area, key winter range, crucial summer range, migration corridor/ migration); elk (critical winter range, calving area); bighorn habitat/movement corridor; and key water use areas.

4.5.3.3.2 NNR

NNR restoration and reinstatement of freight rail operations is not expected to have substantial adverse impacts on wildlife north of milepost 123 (David Evans and Associates, Inc., 2002). Threatened and endangered species are not known to occur near the NNR in this reach and other wildlife species would likely avoid the area during construction. NNR operations in the past have not affected migration and foraging habits of wildlife and would not be expected to in the future (David Evans and Associates, Inc., 2002). Implementation of an Integrated Pest Management Plan would minimize the potential for chemical treatment impacts to wetlands and riparian resources, and thus wildlife. BMPs recommended by David Evans and Associates, Inc. (2002) to minimize the potential for track-related fires, and thus impacts to wildlife habitat, were described in Section 4.5.1, *Vegetation*. South of milepost 123, fish and other aquatic life could be adversely affected by placing fill within the NNR Rail Line to stabilize the track bed between mileposts 123 and 128.4. This reach is south of the White Pine Energy Station Proposed Action and Alternative 1 rail spur sites (David Evans and Associates, Inc., 2002).

4.5.3.4 No Action Alternative

No Station-related impacts on wildlife and fisheries resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.5.4 Threatened, Endangered, Candidate, and Sensitive Species

The following sections describe anticipated direct and indirect effects to special status species, which consist of Designated Threatened, Endangered, Candidate, and Sensitive species, from the White Pine Energy Station Proposed Action and Alternative 1. The upgrade of the NNR to Shafter has been addressed in a separate Environmental Assessment prepared by David Evans and Associates, Inc. (2002) for White Pine County and is summarized in this section.

Any impacts to sagebrush-dominated shrublands, wetlands, and springs that are important for a variety of special status species are of special concern. Approximately 100 bird species and 70 mammal species are found within sagebrush habitats (Braun et al., 1976), including special status species such as the greater sage-grouse, Brewer's sparrow, sage thrasher, sage sparrow, and pygmy rabbit. According to Partners in Flight (Neel, 1999), 63 percent of U.S. populations of shrubland and shrub-dependant species and 70 percent of grassland species are declining. In the intermountain West, more than 50 percent of grassland shrubland species are showing a downward trend (Sauer et al., 1996). Sagebrush Shrublands are considered a Priority A Habitat in Nevada according to the *Coordinated Implementation Plan for Bird Conservation in Nevada* (Nevada Steering Committee Intermountain Joint Venture, 2005). Priority A Habitat has "high overall rating: high to medium value to birds, high to medium threat, high to medium opportunity for protection, restoration, and or enhancement of habitat." According to the *Coordinated Implementation Plan for Bird Conservation in Nevada*, native sagebrush habitats are in serious decline throughout the Great Basin, along with sagebrush-obligate bird species such as the greater sage-grouse. Remaining sagebrush habitat in Nevada is often badly damaged because of over-grazing and introduction of exotic grasses and forbs (Nevada Steering Committee Intermountain Joint Venture, 2005).

In the arid Great Basin, wetland habitat and the springs serve a similar critical importance for several special status species that rely on water sources and wetland vegetation communities.

In terms of special status plants, the Station Proposed Action and Alternative 1 both cross areas with potential habitat for several of the special status species. The impact assessment in this EIS is based on the presence of suitable habitat within the proposed Station ROWs.

Construction, operation, and maintenance of Station facilities for the Proposed Action and Alternative 1 may result in direct, indirect, temporary, and permanent disturbances to special status species and their associated habitats. Impacts are characterized in the same manner as was described in Section 4.5.3, *Wildlife and Fisheries Resources.*

A summary of likelihood of effects to special status wildlife species for the Proposed Action and Alternative 1 is presented in Table 4.5-4. The following sections discuss the potential impacts resulting from the Proposed Action and Alternative 1.

4.5.4.1 Proposed Action

4.5.4.1.1 Impacts to Federally Listed Species

Construction and operation of the Station Proposed Action may affect, but is not likely to adversely affect the bald eagle—the only federally listed species that is endangered, threatened, or proposed for listing that is known to occur in the Station project area. The yellow-billed cuckoo, a federal candidate species listed by the FWS as potentially occurring in the area, does not occur in White Pine County and is not discussed further. A separate Biological Assessment (BA) submitted to the FWS per Section 7 consultation requirements provides detailed analysis for the bald eagle.

TABLE 4.5-4

Potential for Adverse Effects to Special Status Wildlife Species from the White Pine Energy Station Proposed Action and Alternative 1

Scientific Name	Common Name	Status	Potential for Adverse Effect	
			Proposed Action	Alternative 1
Mammals				
Brachylagus idahoensis	Pygmy rabbit	NDOW-SSC BLM-S	Yes	Yes
Microdipodops megacephalus	Dark kangaroo mouse	NDOW-P	Yes	Yes
Sorex prebli	Preble's shrew	BLM-S	Unknown	Unknown
Myotis thysanoides	Fringed myotis	NDOW-P BLM-S	Unknown	Unknown
Corynorhinus townsendii	Townsend's big-eared bat	NDOW-P/S BLM-S	Unknown	Unknown
Antrozous pallidus	Pallid bat	NDOW-P BLM-S	Unknown	Unknown
Euderma maculatum	Spotted bat	NDOW-P/T BLM-S	Unknown	Unknown
Myotis californicus	California myotis	BLM-S	Unknown	Unknown
Myotis ciliolabrum	Western small footed myotis	BLM-S	Unknown	Unknown
Myotis lucifugus	Little brown myotis	BLM-S	Unknown	Unknown
Birds				
Haliaeetus leucocephalus	Bald eagle	FWS-Threatened	Yes	Yes
Centrocercus urophasianus	Greater sage-grouse	NDOW-SSC BLM-SSC	Yes	Yes
Aquila chrysaetos	Golden eagle	NDOW-P BLM-S	Unknown	Unknown
Accipiter gentiles	Northern goshawk	NDOW-P BLM-S	Unknown	Unknown
Buteo regalis	Ferruginous hawk	NDOW-P BLM-S	Yes	Yes
Buteo swainsoni	Swainson's hawk	NDOW-P BLM-S	Yes	Yes
Agelaius tricolor	Tricolored blackbird	BLM-S	No	No
Lanius ludovicianus	Loggerhead shrike	NDOW-S BLM-S	Yes	Yes
Spizella breweri	Brewer's sparrow	NDOW-S	Yes	Yes
Oreoscoptes montanus	Sage thrasher	NDOW-S	Yes	Yes

TABLE 4.5-4

Potential for Adverse Effects to Special Status Wildlife Species from the White Pine Energy Station Proposed Action and Alternative 1

Scientific Name	Common Name	Status	Potential for Adverse Effect	
			Proposed Action	Alternative 1
Asio otus	Long-eared owl	NDOW-P BLM-S	Unknown	Unknown
Asio flammeus	Short-eared owl	NDOW-P BLM-S	Unknown	Unknown
Athene cunicularia	Burrowing owl	NDOW-P BLM-S	Yes	Yes
Baeolophus griseus	Juniper titmouse	BLM-S	Yes	Yes
Charadrius alexandrius	Snowy plover	BLM-S	No	No
Chlidonias niger	Black tern	BLM-S	No	No
Falco mexicanus	Prairie falcon	NDOW-P BLM-S	Yes	Yes
Falco peregrinus	Peregrine falcon	NDOW-P BLM-S	Yes	Yes
Grus canadensis	Sandhill crane	BLM-S	Yes	Yes
Icteria virens	Yellow-breasted chat	BLM-S	Yes	Yes
Ixobrychus exilis	Least bittern	BLM-S	Yes	Yes
Leucosticte atrata	Black rosy-finch	BLM-S	Yes	Yes
Gymnorhinus cyanocephalus	Pinyon jay	BLM-S	Yes	Yes
Melanerpes lewis	Lewis's woodpecker	BLM-S	Yes	Yes
Numenius americanus	Long-billed curlew	BLM-S	Yes	Yes
Pooecetes gramineus	Vesper sparrow	BLM-S	Yes	Yes
Sphyrapicus nuchalis	Red-naped sapsucker	BLM-S	Yes	Yes
Vireo vicinior	Gray vireo	BLM-S	Yes	Yes
Otus flammeolus	Flammulated owl	BLM-S	Yes	Yes
Dolichonyx oryzivorus	Bobolink	BLM-S	Yes	Yes
Reptiles				
Eumeces gilberti rubricaudatus	Western red-tailed skink	BLM-S	Unknown	Unknown
Phrynosoma douglassii	Short-horned lizard	BLM-S	Yes	Yes
Amphibians				
Rana pipiens	Northern leopard frog	NDOW-P BLM-S	Yes	Yes
Rana luteiventris	Columbia spotted frog	NDOW-P	Unknown	Unknown

TABLE 4.5-4

Potential for Adverse Effects to Special Status Wildlife Species from the White Pine Energy Station Proposed Action and Alternative 1

Scientific Name	Common Name	Status	Potential for Adverse Effect	
			Proposed Action	Alternative 1
Insects				
Polites sabuleto nigrescens	Dark sandhill skipper	BLM-S	Unknown	Unknown
Cercyonis pegala pluvialis	White River wood nymph	BLM-S	Unknown	Unknown
Euphydryas editha koreti	Koret's checkerspot	BLM-S	Unknown	Unknown
Phyciodes pascoensis arenacolor	Steptoe Valley crescentspot	BLM-S	Unknown	Unknown
Euphilotes bernadino minuta	Baking powder flat blue	BLM-S	Unknown	Unknown
Fish				
Relictus solitaries	Relict dace	NDOW-P/S BLM-S	Yes	Yes
Springsnails				
Eremopyrgus eganensis	Steptoe hydrobe	NNHP-S1	No	No
Oreohelix nevadensis	Schell Creek mountainsnail	NNHP-S1	No	No
Pyrgulopsis anguina	Longitudinal gland springsnail	NNHP-S1	No	No
Pyrgulopsis cruciglans	Transverse gland pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis landyei	Landyes pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis marcida	Hardy springsnail	NNHP-S1	No	No
Pyrgulopsis neritella	Neritiform Steptoe Ranch springsnail	NNHP-S1	No	No
Pyrgulopsis orbiculata	Sub-globose Steptoe Ranch pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis peculiaris	Bifid duct pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis planulata	Flat-topped Steptoe springsnail	BLM-S NNHP-S1	No	No
Pyrgulopsis sathos	White River Valley springsnail	NNHP-S1	No	No
Pyrgulopsis serrata	Northern Steptoe Springsnail	NNHP-S1	Yes	No
Pyrgulopsis sulcata	Southern Steptoe pyrg	NNHP-S1	No	No

Potential effects to bald eagles that could result from the Proposed Action include the following:

- Direct loss and fragmenting of foraging habitat and indirect reduction of prey
- Risk of collision or electrocution from Station transmission and distribution lines and cooling towers
- Disturbance from increased Station-induced noise and human activity
- Potential for ingestion of prey with elevated levels of contaminants or accidental spills
- Increased risk of illegal poaching as a result of increase in people in Steptoe Valley

Construction of the Station Proposed Action would result in the permanent loss of approximately 1,516 acres of habitat, including 4 acres of wetland habitat, primarily in Steptoe Valley (see Table 4.5-1). Some wetland habitat could also be lost or degraded over time during Station operations at 12 springs in Steptoe Valley because of ground water pumping reducing outflows. Implementation of ground water monitoring and mitigation described in Section 4.4, *Ground Water Resources,* should substantially reduce this risk.

None of the habitat that would be affected by the Proposed Action in Steptoe Valley consists of suitable bald eagle nesting habitat. There are no nesting bald eagles in Steptoe Valley and the nearest site near aquatic foraging habitat that has trees is in the vicinity of Basset Lake, 17 miles from the Proposed Action power plant site. Although approximately 3 miles of the Proposed Action transmission line ROW would be within or adjacent to pinyon pine/juniper woodlands in the Egan Range, this area is more than 4.5 miles from Duck Creek and consists of relatively short trees. Thus, the Proposed Action would not eliminate or adversely affect any bald eagle nesting habitat.

Station construction and operation effects on upland and wetland habitats could result in a reduction of waterfowl and small mammals that are utilized as a food source by wintering eagles. The loss of wetland habitat would be most substantial in the immediate vicinity of the Proposed Action rail spur that would cross Duck Creek. Given the comparatively small acreage involved relative to the availability in Steptoe Valley and the infrequent use of Steptoe Valley by wintering eagles, this impact should be discountable.

Increased risk of electrocution of bald eagles could result from the construction of the electrical distribution lines along the approximately 13-mile-long water pipeline and at the power plant and substations. Risk of electrocution is reduced if electrical phases are at least 60 inches apart as recommended by Avian Power Line Interaction Committee (1996, 2006). Based on pole and tower designs described in Chapter 2, some of the distribution line structures may not meet Avian Power Line Interaction Committee guidelines and could therefore represent an electrocution risk without the installment of perch deterrents or other measures, which would occur as described in Chapter 2. The 345-kV and 500-kV transmission lines would not pose an electrocution risk because of the large distance between electrical phases (see Chapter 2 for additional information on the tower and pole designs). It is possible that the addition of lattice towers could attract bald eagles to attempt to nest or roost.

Collisions with power lines occur infrequently because of the eagle's visual acuity. Occasionally, problems arise where bald eagles concentrate for foraging. The cooling towers and other facilities at the Proposed Action power plant site should present a minimal collision or electrocution risk because of the high visibility of the structures and level of noise and human activity that could make eagles avoid the immediate site.

The Proposed Action transmission lines that may pose the greatest risk of collisions would be in the 2.5-mile-long ROW that crosses Duck Creek and Steptoe Valley where waterfowl occur and the portion of the 500-kV transmission line that would span the Egan Range.

During the 5- to 6-year construction period, operation of heavy equipment and machinery, and human activity could cause eagles to avoid the vicinity. Noise levels of more than approximately 70 dBA have been shown to cause disturbance of some wildlife species. Thus, under most construction periods, this zone would likely extend approximately 660 feet from the noise source. Given the small area affected relative to the overall area in Steptoe Valley and the low level of bald eagle use in most of Steptoe Valley, the construction activities are not likely to cause substantial disturbance to eagles.

At the termination of power plant construction, 30 to 50 steam blowouts would take place over a period of several weeks. Each blowout would produce short-duration (several minutes) noise levels of approximately 166 dBA (15 to 30 dBA reduction with the installation of mufflers) at the site and 74 dBA at 3 miles from the site (see Section 4.6.2, *Noise*). The steam blowouts may result in disturbance of wildlife within this zone. The level of disturbance would depend on time of year that they occur (undetermined) and presence of bald eagles. In addition to disturbance, the loud noise during these events could lead to direct injury of bald eagles if they are present within approximately 2 miles of the site. Noise levels more than 92 dBA are potentially injurious to birds, although there is likely substantial variation among species. Impacts to bald eagles could be minimized by conducting the steam blowouts during August and September. Appendix A, *Best Management Practices*, contains a BMP that calls for an observer to be present to visually search for and make sure no bald eagles are present in the power plant area prior to steam blowouts.

During Station operation, the train traffic noise level is estimated to be 42 dBA Leq (1 hour) at 3 miles away from the power plant, which is below the existing noise levels of 45 to 50 dBA. Therefore, coal train traffic would not cause adverse noise impacts very far from the immediate rail spur and power plant site. Transformer noise from the Duck Creek Substation and Thirtymile Substation would not cause a noise impact. Noise from the three natural draft cooling towers and forced draft fan would not cause a noise impact.

There should be no effect to the small number of eagles that occasionally forage near Basset Lake and the McGill Tailings Reclamation Area.

Emissions from the Proposed Action power plant would not be expected to increase contaminant levels in nearby bald eagle habitats. There would be a small risk of water quality impacts in Duck Creek because of the rail spur crossing. Potential contamination of Duck Creek could reduce wildlife use and thus prey availability and could potentially bio-accumulate in prey species upon which bald eagles forage. Appendix A, *Best Management Practices,* contains BMPs that are an integral part of the proposed Station that would minimize or avoid the potential for contaminant risk. The proximity of the evaporation pond to the power plant may discourage most wildlife, including bald eagles, from the site. Water quality monitoring would be conducted in the evaporation pond as mandated by state law, to confirm water quality conditions and to ensure that no wildlife toxicity problems occur. Evaporation pond monitoring and mitigation are described in Section 4.5.3.1.3, *Mitigation.* Appendix A contains BMPs directed at resource protection at the evaporation pond. Overall, the Proposed Action is likely to cause relatively minimal effects to the bald eagle because of the low level of use and distance from important habitats.

4.5.4.1.2 Impacts to BLM and State of Nevada Sensitive and Protected Wildlife and Fish Species

Bats

Seven species of bats are protected under Nevada State Law or are BLM-Sensitive species. Six of the seven Sensitive species have the potential to occur in the Station project area. There is no site-specific information available to assess impacts on bats. However, impacts to bat species could primarily occur from the elimination and temporary disturbance of sagebrush and other shrublands and wetland habitats that provide foraging habitat. Long-term degradation of these habitats could also occur if noxious and invasive weeds increase in response to the increased activity and land disturbance. Similarly, if contamination of aquatic habitats occurred it could lead to adverse effects on bats that forage there.

The Proposed Action power plant, rail spur, and water supply system do not contain breeding or hibernating habitats for bat species. However, the sites could be used by species that forage in sagebrush and grassland habitats, and in the case of the rail spur, near wetland and aquatic habitats. Thus, Station construction could directly reduce foraging habitat, particularly with the permanent loss of 485 acres of sagebrush (Montane and Big) and 4 acres of wetlands. The Proposed Action electric transmission lines would span a portion of the Egan Range that may contain roosting and breeding habitat for BLM and State-protected bat species.

Depending on the constituents of water in the evaporation pond in site runoff, there is a potential risk of contamination impacts to bats. Contamination could result in effects to BLM sensitive bat species. Monitoring evaporation pond water quality and implementing mitigation measures as necessary would minimize the potential for adverse impacts.

The primary potential permanent or temporary impact to bat species associated with the operation of the Proposed Action water supply system is the potential for ground water drawdown Approximately 12 springs are in areas where pumping for the Proposed Action may result in at least 2 feet (up to 6 feet) of ground water decline. If drawdown in spring flows does occur, it could adversely affect bat prey availability if insect populations are affected. Ground water and spring monitoring and mitigation as necessary (see Section 4.4, *Ground Water Resources*) should minimize the likelihood of this potential effect.

The Proposed Action rail spur would span the largest wetland complex within the Station project area. This area provides foraging habitat for BLM sensitive bat species that could or are known to occur within Steptoe Valley. Potential temporary impacts associated with construction of the rail spur include: avoidance of the construction area and important watering source; increased noise and human presence; and impacts to foraging areas prior to reclamation of the area. Potential permanent effects during operation of the rail spur include increased noise; spread of noxious and invasive weeds into important foraging areas; increased risk of contamination to aquatic insect populations; and permanent loss of habitat in areas with bridge structures (approximately 9 acres). It is uncertain to what extent noise would impact bat activity. Level of noise impact would likely depend on the timing of the trains entering and leaving the plant site. (If this occurred only during the day, impacts may be minimal). Rehabilitation and use of the NNR alignment that parallels portions of Duck Creek could cause additional direct and indirect impacts to bats and their foraging habitats.

The primary potential impact resulting from the operation of the two substation sites is the collision/electrocution risk with associated structures and disturbance to foraging habitats. The Thirtymile Substation site is located adjacent to an ephemeral drainage, which may be used by sensitive bat species.

The upgrade of 12 miles of existing access roads and construction of 35 miles (16 acres) of access roads would increase habitat fragmentation within Steptoe and Butte Valleys, increase risk of spread of noxious and invasive weeds, and increase human presence and disturbance in the area both during and following construction (maintenance activities). These effects could all contribute to the loss of bat habitat and increase disturbance threats.

Bird Species

No targeted surveys were conducted for special status avian species, except ferruginous hawk and the greater sage-grouse. Therefore, potential impacts to the majority of the avian special status species were assessed by evaluating habitat loss/ disturbance and other project effects. Section 4.5.3, *Wildlife and Fisheries Resources* discusses general types of wildlife impacts relative to reported occurrences and the presence of potential habitat in the Station project area vicinity. Potential permanent impacts to special status avian species and their habitats common to both the Proposed Action and Alternative 1 from Station construction, operation, and maintenance include the following:

- Loss of foraging, breeding, summer, and wintering habitats within Station footprints for the power plant sites, substation sites, and newly constructed access roads
- Increased potential for spread of noxious and invasive weed species that may lead to a reduction in forage for avian species of concern
- Increased habitat fragmentation within the affected portions of Steptoe and Butte Valleys
- Risk of collision associated with the electric transmission and distribution lines (including guy wires for poles), power plant and substation facilities
- Increased risk of contamination from the evaporation pond associated with the power plant site and the rail spur over Duck Creek
- Increased predation as a result of increased perching opportunities for

birds of prey (distribution lines, substations, well fields)

- Impacts to surface waters and springs that provide foraging habitats; increased human disturbance and noise
- Increased potential for poaching and hunting.

The MTBA requires that surveys be conducted prior to construction to prevent the inadvertent take of nests or nesting species protected under the MTBA. Surveys would be conducted prior to construction to comply with this federal law.

Avian species of special concern for the Station project area are primarily associated with sagebrush habitats. Approximately 1,226 acres of Big Sagebrush, Montane Sagebrush, and Mixed Great Basin Shrublands habitat types would be permanently impacted by the Proposed Action (see Table 4.5-10). Species found in sagebrush habitats are identified in Section 3.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*. Some of these species include the greater sage-grouse, ferruginous hawk, Brewer's sparrow, and the sage thrasher. Impacts to the greater sage-grouse and ferruginous hawk are described in detail later in this section. The Moriah Ranches Seeding Project (described in Section 2.2.6, *Enhancement Measures*) would be implemented to create a habitat mosaic that provides cover for sage-grouse and other species on 700 to 900 acres. Islands of big sagebrush cover would be identified for non-disturbance and the understory component of this habitat would be restored by mechanical treatment.

Sagebrush is a difficult species to restore to the landscape. As a result, sagebrush habitat may take an extended period of time to re-establish and may lead to long-term impacts to sagebrush affiliated species throughout the Station project area.

Loss of wetland habitat could adversely affect several special status species as well, such as sandhill cranes, hawks, and owls.

Approximately 4 acres of wetland would be permanently affected by the Proposed Action and could reduce habitat for the sandhill crane and the various hawk and owl species that could forage for small mammals there.

Construction activity and noise could result in the avoidance of areas near construction sites and, if occurring during the nesting season, could result in the failure of nests or direct loss of nests. This would be minimized by conducting preconstruction surveys as required by the MBTA (see Appendix A, *Best Management Practices).*

Permanent impacts associated with operation and maintenance of these Station features include the following:

- Risk of collision
- Increased human presence, and therefore noise in the Station area
- Fragmentation of habitat-both aerially and at ground level
- Disturbance to suitable nesting, brooding, foraging, and wintering habitats
- Increased predation on neotropical birds as a result of increased perching opportunities for corvids and other avian predators, especially where lattice towers are utilized

The estimated acres of permanent and temporary impacts by Station feature and structure for the proposed action are described in Section 4.5.1, Vegetation and Section 4.5.3, *Wildlife and Fisheries Resources*. Table 4.5-1 summarizes permanent and temporary impacts by Station feature for the Proposed Action. The Proposed Action electric transmission lines would span a portion of the Egan Range and could result in elimination of suitable nesting and breeding habitat for BLM and State Protected raptor and avian species.

Greater Sage-grouse

Potential impacts to greater sage-grouse resulting from construction and operation of the Proposed Action would be similar to those described in the preceding text for special status avian species. Additional details are provided below for impacts that may apply to sage-grouse.

According to the vegetation mapping done for the proposed Station as described in Section 3.5.1, *Vegetation*, approximately 9 miles of the proposed transmission lines ROW within the SWIP corridor are located in sagebrush shrublands vegetation. Most of the Proposed Action water pipeline corridor is located in Big Sagebrush Shrubland or Mixed Great Basin Shrubland vegetation communities as defined in Section 3.5.1.1, *Vegetation Communities*.

As noted previously, a total of approximately 1,226 acres of potentially suitable sagebrush habitat types would be permanently impacted by construction of the Proposed Action, primarily in Steptoe Valley but also in Butte Valley (see Figure 3.5-2 and Table 4.5-1). One lek site (last active in 2005) would be directly impacted by construction and operation of the Proposed Action transmission line. There are five other historic leks within 2 miles of the Proposed Action transmission line ROW. While these leks were not active in 2006 they still provide suitable lek and breeding habitat for sage-grouse. Even after the revegetation of temporarily disturbed areas, the fragmented sagebrush habitat would likely be less suitable for potential nesting and foraging habitat in the future. According to Partners in Flight (Neel, 1999), greater sage-grouse and sharp-tailed grouse need several thousand hectares of adequately connected habitat to maintain self-sustaining populations.

Another potential adverse indirect effect of the Proposed Action is increased predation by raptors caused by the increased perch sites on transmission and distribution line structures. Sage-grouse are particularly vulnerable when strutting for female grouse on sites, known as leks. According to the *Greater Sage-grouse Conservation Plan for Nevada and Eastern California* (Connelly et al., 2004), sage-grouse will often nest and brood within 4 miles of an active lek site. Transmission towers may create both surface and vertical habitat fragmentation for the greater sage-grouse. As a result, construction and operation of Station features within 4 miles of leks may lead to loss and degradation of nesting habitat and permanent grouse abandonment of breeding habitats or direct mortality through increased predation. The use of perch deterrents on transmission and distribution line structures as described in Chapter 2 should reduce the potential for increased direct mortality because of increased predation by raptors.

Sage-grouse have been documented to be negatively impacted by power lines through accidental contact while in flight and through predation by raptors that use power line poles as perches (Graul 1980, Ellis 1984, 1987). Studies show that sage-grouse use of areas near power lines, as measured by pellet transects, increases as distance from the power line increases for up to 600 m (Braun, unpubl. data in Braun 1998). Power lines fragment habitats useful to sage-grouse and reduce their security in linear strips up to 1 kilometer wide. Estimates of areas impacted by power lines are not available at this time. Braun (1998) indicates that "it is possible to markedly reduce the impact of power lines upon sage-grouse through elimination of raptor perch sites." As noted previously, the use of perch deterrents on transmission and distribution line structures as described in Chapter 2 should reduce the potential for increased direct mortality because of increased predation by raptors.

Operation of the Proposed Action transmission line would result in fragmentation of greater sage-grouse habitat. Consequences of fragmentation can vary, but may include competition for fewer suitable nesting sites, reduced food supplies, the isolation of breeding habitat from brood-rearing areas and leks from nesting habitat. Such outcomes may lead to lower reproduction rates for sage-grouse and other wildlife species that use this habitat for all or part of their life cycle (BLM, 2004).

In all, there are six known leks within 2 miles of the Station features that could be subjected to adverse impacts. The closest greater sage-grouse lek to the electric transmission line and distribution line is Log Canyon, N located 2,085 feet west of the transmission line corridor. Log Canyon was not active in 2006, but was active in 2005. The Log Canyon, N lek may be adversely impacted by construction and operation of the Proposed Action transmission lines. The lines would fragment surrounding habitats, and would potentially lead to an increase in raptor predation. There are five additional leks within 2 miles of the Proposed Action transmission lines that could be adversely affected by increased predation. In addition because future lek and nesting activity could occur in the sagebrush habitats anywhere in the valleys, suitable habitat within 2 miles of the transmission lines represents the area within which sage-grouse would be most directly affected. This impact would be minimized through installation of perch deterrents on the structures, as described under the Proposed Action (see Chapter 2). However, even with these measures it is likely that sage-grouse would avoid these lek sites in the future.

No known grouse leks are located within the Proposed Action power plant or water supply system footprints; however, sage-grouse may inhabit these areas because of the presence of sagebrush habitat.

Temporary and permanent impacts to sage-grouse from the construction and operation of the Proposed Action water supply system would be similar to those described previously for special status avian impacts. Riparian and aquatic habitats are frequently used by greater sage-grouse. A potential long-term indirect impact to the greater sage-grouse associated with the operation of the Proposed Action water supply system is the potential for ground water drawdown as a result of well pumping (see Section 4.4, *Ground Water Resources*). Twelve springs, including two that had sage-grouse sign detected during 2005, are in areas where pumping for the Proposed Action may result in at least 2 feet (up to 6 feet) of ground water decline. This potential for drawdown in surface waters may adversely affect greater sage-grouse inhabiting and foraging in aquatic/wetland habitats within Steptoe Valley at various times throughout the year, particularly in spring and summer months.

The Proposed Action rail spur location spans the largest wetland complex within the project area. This area provides foraging habitat for greater sage-grouse. Potential impacts are similar to those described under the water supply system and under the special status avian impacts section. The loss of wetland habitats could also reduce habitat for foraging sage-grouse.

Ferruginous Hawks

No active ferruginous hawk nests are known to exist in the Station project area. Suitable nesting habitat exists only in the juniper stringers within the proposed transmission line corridor on the east and west flanks of the Egan Range and portions of Butte Valley. Suitable foraging habitat exists throughout Steptoe and Butte Valleys. The Proposed Action and Alternative 1 would have similar impacts to this species and, therefore, the following discussion applies to both. Under both the Proposed Action and Alternative 1, preconstruction surveys would be necessary to avoid potentially affecting active nests and complying with the MBTA (see Appendix A, *Best Management Practices*).

Ferruginous hawks would likely avoid all construction areas at all Station facilities (see previous discussion of bald eagle for additional information). The permanent loss of grassland, wetland, and shrubland habitat would reduce overall foraging habitat quality in Steptoe Valley.

The proposed Station transmission line would span approximately 17 acres of pinyon-juniper woodlands (see Figure 3.5-1 and Table 4.5-1), which may provide suitable nesting habitat for this species. The primary potential nesting habitats are located on the lower slopes of the Egan Range. The actual area of permanent impact in this community type, however, is approximately 0.03 acre. Potential temporary effects in the vicinity of transmission lines include avoidance of the project area, increased noise, and increased human presence. Because ferruginous hawks are highly sensitive to disturbance during the nesting season, the increased activity could eliminate nesting potential in the immediate area of the transmission line. No other Station facilities associated with the Proposed Action would directly affect potential nesting habitat (juniper stringers). Surveys would be constructed prior to construction to avoid impacts to nesting individuals as described in Appendix A, *Best Management Practices*. Permanent habitat impacts from Proposed Action construction and operation would include loss of foraging habitat within tower structure footprints; degradation of foraging habitat from the introduction of noxious and invasive weed species; habitat fragmentation; and increased risk of collision with power lines. The presence of the transmission and distribution lines would increase collision risk in the Station project area, but conversely would benefit this species by providing additional perches from which to hunt. Potential impacts caused by the water supply system would be similar to those described previously for special status avian species. The primary potential impact associated with this Station feature would be collision risk resulting from the well site distribution lines and increased perching opportunities (discussed above under distribution lines). The use of perch deterrents on distribution line structures as described in Chapter 2 should reduce the potential for increased direct mortality because of increased predation by raptors.

Other Raptor Species

Suitable habitat exists for a number of raptor species considered to be special status species in the Station project area, including the golden eagle and prairie falcon. Neither of these species was found nesting in the Proposed Action or Alternative 1 Station project areas during field surveys. However, surveys conducted by Hawkwatch International in the Egan and Schell Creek Ranges documented many sightings of golden eagles and a small number of prairie falcons in the area (HWI 2005). Potential impacts described previously for ferruginous hawk also apply to these species and to the other raptors (northern goshawk and Swainson's hawk) with the potential to occur in the Station project area.

Pygmy Rabbits

Pygmy rabbits occur in Steptoe Valley and could be affected by the direct loss of sagebrush habitat, disturbance during Station construction, and increased raptor predation. No pygmy rabbits were observed in the Proposed Action project area, so direct impacts may be minimal. However, suitable sagebrush habitat for pygmy rabbits exists within the Proposed Action power plant, transmission lines, and water supply system ROWs. The primary Proposed Action features that would potentially lead to permanent impacts to these species are the power plant footprints and the water supply system.

Loss of sagebrush habitat according to Station features is summarized in Table 4.5-1. The Proposed Action power plant would have the largest extent of permanent impacts of all project features on sagebrush habitat at 390 acres. More than 60 acres of potential pygmy rabbit habitat would be temporarily affected by the Proposed Action water supply system and approximately 8 acres would be permanently affected by construction of access roads to the water supply system. It is in this area of Proposed Action features that the potential for temporary and permanent impacts is greatest. No suitable pygmy rabbit habitat occurs near the Proposed Action rail spur.

Sagebrush is a difficult species to restore to the landscape. As a result, sagebrush habitat may take an extended period of time to re-establish and may lead to long-term impacts to pygmy rabbits and other sagebrush affiliated species.

Small Mammals

The two special status small mammal species that occur in the Station project area are the dark kangaroo mouse and the Preble's shrew. Potential impacts to these species from the Proposed Action and Alternative 1 are similar to those described for the pygmy rabbit since they are ground dwelling, burrowing species. Approximately 485 acres of sagebrush habitat and 4 acres of wetland habitat would be permanently impacted by the Proposed Action, as compared to 884 acres of sagebrush habitat and 6 acres of wetland habitat permanently impacted by Alternative 1 (see Tables 4.5-1 and 4.5-2).

Reptiles

Horned lizards were ubiquitous throughout both the Proposed Action and Alternative 1 project areas. Potential impacts to these species are similar to those described for small mammals and pygmy rabbits. These species are more susceptible to impacts because of their small size, and their inability to move long distances from disturbance. The construction phase for all Station features would likely adversely affect these species. Pulling cable and dragging equipment may lead to the inadvertent take of these species and destruction of their habitats. Operation of the evaporation pond and use of access roads may also lead to inadvertent take and contamination of these species and their food chain.

Amphibians

Construction of the Proposed Action would result in the direct loss of 4 acres of wetlands, primarily along Duck Creek. In addition, numerous drainages that carry water during high flow events and spring runoff would be directly impacted by the Proposed Action (see Section 4.5.3, *Wildlife and Fisheries Resources*). These impacts to wetlands and small drainages could directly impact special status amphibians—northern leopard frogs—from direct loss of seasonal aquatic sites and alteration of flow patterns. Long-term ground water pumping during Station operation could also reduce flows and water levels at 12 springs in Steptoe Valley, which could eliminate or adversely affect habitat for northern leopard frog or Columbia spotted frog, if they occur in the area. Operation of the Proposed Action rail spur could increase risk of contamination of aquatic habitat along Duck Creek. Vehicular access along access roads of the water supply system could contribute to erosion or contamination of the seasonal or intermittent steams that could be used by these two species.

The evaporation pond could attract special status species of amphibians and could potentially lead to direct mortality from ingestion of contaminants. BMPs in Appendix A and mitigation described in Section 4.5.3.1.3, *Mitigation*, describe measures for monitoring and avoiding or minimizing the potential for evaporation pond impacts to terrestrial wildlife.

Aquatic Species of Concern

One species of special status aquatic springsnail (the Northern Steptoe Springsnail) occurs in ten springs in Steptoe Valley, including three of the 12 springs that are at risk of experiencing more than 2 feet of ground water drawdown (see discussion and figures in Section 4.4, *Ground Water Resources).* Reduced flows and water levels at these springs could eliminate populations of this species, which have extremely restricted distributions.

None of the 12 springs predicted to be susceptible to ground water drawdown under the Proposed Action were found to support relict dace during surveys conducted at 45 springs in the Station vicinity. It is unlikely that Duck Creek supports relict dace. As such, there is minimal potential for impacts to relict dace.

4.5.4.1.3 Impacts to BLM and State of Nevada Sensitive and Protected Plant Species

Ground-disturbing activities associated with the Station Proposed Action and Alternative 1 have the potential to directly disturb populations of special status plant species. Because surveys were not conducted for special status plant species, potential Station effects are summarized based on the presence of potential habitat observed during 2005 field examinations. Potential habitat for eight special status plant species would be affected by Proposed Action features. They include meadow milkvetch, dainty moonwort, White River catseye, sunnyside green gentian, sand cholla, Parish phacelia, Ute ladies'-tresses orchid, and woolly-head clover. A ninth species—Monte Neva paintbrush—occurs at Monte Neva Hot Springs, which would not be affected by the Station but should be considered throughout Station construction because of its proximity to the Station project area. By far, the

Proposed Action water pipeline, rail spur, and transmission line ROWs present the greatest potential risk of direct impacts to special status plant species because they cross a diversity of habitats, including wetlands and wet meadows.

During Station operation, ground water pumping could reduce flows and water levels at 12 springs in Steptoe Valley. Reduced flows could adversely affect special status plants, including meadow milkvetch, dainty moonwort, Parish phacelia, Ute ladies'-tresses orchid, and woolly-head clover.

4.5.4.1.4 Mitigation

Mitigation measures for biological resources are directed primarily at wildlife habitat and wildlife resources, but they cover the range of potential effects on all biological resources addressed in the EIS. For this reason, all mitigation associated with biological resources and required for the Proposed Action is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.4.2 Alternative 1

4.5.4.2.1 Impacts to Federally Listed Species

Potential impacts to bald eagles under Alternative 1 would be similar to the Proposed Action, with the following exceptions. The Alternative 1 rail spur would not cross Duck Creek, so less high-quality wetland habitat would be affected. Assuming that the NNR is rehabilitated and used to access the Alternative 1 power plant site, the potential risk of contamination in Duck Creek and associated wetlands would be similar to that of the Proposed Action. Pumping from the Alternative 1 wellfield would not affect wetland habitat associated with any of the springs in Steptoe Valley, thus reducing the potential for long-term effects to the bald eagle prey base.

The location of the power plant and water pipeline under Alternative 1 would be somewhat closer to the Basset Lake bald eagle foraging area than under the Proposed Action and could potentially have a greater impact on bald eagles relative to the Proposed Action. However, it would still be more than 1 mile from the area, so noise disturbance impacts should be minimal.

As with the Proposed Action, the distribution line poles may pose an electrocution risk to bald eagles that may perch on them. Use of perch deterrents as described in Chapter 2 should reduce the potential for this risk to occur. There is no obvious difference in terms of relative risk between Alternative 1 and the Proposed Action.

4.5.4.2.2 Impacts to BLM and State of Nevada Sensitive and Protected Wildlife and Fish Species

Bats

Potential impacts described for the Proposed Action are similar to those for Alternative 1 except for the water supply system and rail spur.

No springs would be affected by ground water pumping under Alternative 1 (see Section 4.4, *Ground Water Resources*), thus eliminating the risk of impacts to bat species that utilize the springs in Steptoe Valley. The water supply system ROW for Alternative 1 would temporarily affect 13 acres and permanently affect 2 acres of wetlands, not including associated wet meadows, which would reduce foraging habitats. Overall habitat impacts are summarized in Table 4.5-2 of the discussion of general vegetation community impacts in Section 4.5.1, *Vegetation*. Impacts to bat foraging habitats are expected to be less than for the Proposed Action because of a smaller potential for ground water drawdown and a lack of springs in the Alternative 1 project area.

The Alternative 1 rail spur would not cross Duck Creek, so the potential for contamination adversely affecting the bat prey base and foraging habitat quality is less than for the Proposed Action. However, the rail spur would cross wetlands associated with Duck Creek and could still affect bat foraging habitats there. Even so, the NNR that the rail spur would connect with crosses Duck Creek, so adverse impacts from spills and contamination could potentially occur there.

Bird Species

As discussed for the Proposed Action, potential impacts to special status avian species would largely be a function of impacts to sagebrush and wetland habitats. Alternative 1 would result in greater impacts to sagebrush habitats compared to the Proposed Action, although some of the highest quality sagebrush habitat would be directly affected by the Alternative 1 water supply system. Potential wetland impacts would be greater for Alternative 1, but the high quality wetlands complex associated with Duck Creek would not be affected, assuming the NNR does not need major rehabilitation in that area.

Greater Sage-Grouse

Potential impacts to sage-grouse from Alternative 1 would be similar to those described for the Proposed Action with the following exceptions. Six would potentially be affected.

Alternative 1 would affect a higher percentage of sage-grouse habitat compared to the Proposed Action. Approximately 5 to 7 miles of the Alternative 1 water pipeline alignment and approximately 4 to 5 miles of the Alternative 1 distribution line would cross Big Sagebrush Shrubland or Mixed Great Basin Shrubland (see Figure 3.5-2).

Because the Alternative 1 transmission line length would be less than for the Proposed Action, the potential for increased predation by raptors may be less than for the Proposed Action. Perch deterrents would be used for the Alternative 1 transmission and electric distribution line towers to reduce the potential for predation by raptors, the same as noted for the Proposed Action.

No long-term impacts to wetland habitat associated with springs in Steptoe Valley would occur under Alternative 1 because ground water pumping under Alternative 1 would not reduce flows at any of the sites.

Ferruginous Hawks

Because ferruginous hawks were not found in the Alternative 1 project area, potential impacts associated with Station construction and operation would be similar to those described for the Proposed Action. The potential for primary effects would be from the portion of transmission line that would be located in the pinyon-juniper woodlands on the lower slopes of the Egan Range.

Pygmy Rabbits

Potential impacts to pygmy rabbits from the Alternative 1 features are similar to those described for the Proposed Action with one exception. Some high-quality habitat and several pygmy rabbits were observed in the Alternative 1 water supply system ROW during 2005 surveys. As a result, construction of the water supply system to the Alternative 1 power plant site may have greater impacts to pygmy rabbits than the Proposed Action.

Approximately 884 acres of potential pygmy rabbit sagebrush habitat would be permanently impacted under Alternative 1, the majority of which is associated with the power plant footprint. Noxious weed infestations in this area also contribute to habitat degradation for this species.

Amphibians

Impacts to special status species of amphibians would be less under Alternative 1 than the Proposed Action because the rail spur would not cross Duck Creek and no springs would be affected by ground water pumping.

Aquatic Species of Concern

No springs would be affected by ground water pumping under Alternative 1, so no impacts to special status aquatic species of concern would occur.

4.5.4.2.3 Impacts to BLM and State of Nevada Sensitive and Protected Plant Species

Potential effects for Alternative 1 would be similar as those for the Proposed Action. Because of the more extensive wet meadow habitat that would be crossed by the water supply system and rail spur under Alternative 1, there may be a greater potential for one or more of the special status plant species to occur there.

4.5.4.2.4 Mitigation

All mitigation associated with biological resources and required for Alternative 1 is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.4.3 Connected Actions

4.5.4.3.1 SWIP

See Section 4.5.1, *Vegetation,* and Section 4.5.3, *Wildlife and Fisheries Resources*, regarding plant and wildlife species of concern and potential effects of the SWIP on these resources as reported by the BLM (1993).

4.5.4.3.2 NNR

See Section 4.5.1, *Vegetation,* and Section 4.5.3, *Wildlife and Fisheries Resources*, regarding plant and wildlife species of concern and potential effects of the NNR on these resources as reported by David Evans and Associates, Inc. (2002).

4.5.4.4 No Action Alternative

No Station-related impacts on threatened, endangered, candidate, or sensitive species would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.6 Air Quality and Noise

4.6.1 Air Quality

This section describes potential impacts of air pollutant emissions from the White Pine Energy Station on ambient air quality. The proposed Station would involve two distinct phases that have the potential for impacting ambient air quality. The first phase is the construction of the power plant and ancillary facilities and the second phase is operation of the power plant. New ancillary facilities required for the power plant include electric transmission facilities, water supply system, rail spur, and access roads. The following analysis is based on the build-up of three pulverized coal fired units with a total capacity of 1,590 MW.

4.6.1.1 Effects of Air Pollution

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations (for example, asthmatics, children, and the elderly) against the effects of the pollutants noted below. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA has established NAAQS for six principal pollutants, which are called "criteria" pollutants: particulate matter, carbon monoxide, ozone, sulfur dioxide, nitrogen dioxide, and lead.

In addition, the Clean Air Act establishes the allowable "PSD increment," which is the maximum allowable deterioration of air quality against baseline conditions, regardless of the magnitude of those baseline conditions. In other words, whether an area has pristine background conditions or has significantly impacted air quality, the Clean Air Act specifies procedures to determine whether impact of sources will cause significant deterioration versus conditions existing as of trigger dates determined by the Clean Air Act.

Therefore, the analyses conducted to predict the impact of the Station on air quality include evaluation of cumulative impacts of the Station plus surrounding sources on both NAAQS and PSD increment. These analyses are noted below.

4.6.1.1.1 Particulate Matter

Particulate matter is a complex mixture of extremely small particles and liquid droplets. EPA is concerned about particles that are 10 micrometers in diameter or smaller (referred to as PM_{10}) because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects.

4.6.1.1.2 Carbon Monoxide

Carbon monoxide can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. The health threat from lower levels of carbon monoxide is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to carbon monoxide at low levels may cause chest pain and reduce that person's ability to exercise. Repeated exposures may contribute to other cardiovascular effects. Even healthy people can be affected by high levels of carbon monoxide. People who breathe high levels of carbon monoxide can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, carbon monoxide is poisonous and can cause death.

4.6.1.1.3 Ozone

Ground level ozone is formed when nitrogen oxides and volatile organic compounds react in the presence of sunlight. Children, people with lung diseases such as asthma, and people who work or exercise outside are susceptible to adverse effects such as damage to lung tissue and reduction in lung function. Ozone can be transported by wind currents and cause health impacts far from original sources. Millions of Americans live in areas that do not meet the health standards for ozone. Other impacts from ozone include damaged vegetation and reduced crop yields.

4.6.1.1.4 Sulfur Dioxide and Nitrogen Oxides

Peak levels of sulfur dioxide in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of sulfur dioxide gas and particles cause respiratory illness and aggravate existing heart disease. Sulfur dioxide reacts with other chemicals in the air to form tiny sulfate particles. When these are breathed, they gather in the lungs and are associated with increased respiratory symptoms and disease, difficulty in breathing, and premature death. Haze occurs when light is scattered or absorbed by particles and gases in the air. Sulfate particles are the major cause of reduced visibility in many parts of the U.S., including our national parks.

Sulfur dioxide and nitrogen oxides react with other substances in the air to form acids, which fall to earth as rain, fog, snow, or dry particles. Some may be carried by the wind for hundreds of miles. Acid rain damages forests and crops, changes the makeup of soil, and makes lakes and streams acidic and unsuitable for fish. Continued exposure over a long time changes the natural variety of plants and animals in an ecosystem. Sulfur dioxide accelerates the decay of building materials and paints, including irreplaceable monuments, statues, and sculptures that are part of our nation's cultural heritage.

4.6.1.1.5 Lead

People, animals, and fish are mainly exposed to lead by breathing and ingesting it in food, water, soil, or dust. Lead accumulates in the blood, bones, muscles, and fat. Infants and young children are especially sensitive to even low levels of lead. Lead causes damage to the kidneys, liver, brain and nerves, and other organs. Exposure to lead may also lead to osteoporosis (brittle bone disease) and reproductive disorders. Excessive exposure to lead causes seizures, mental retardation, behavioral disorders, memory problems, and mood changes. Low levels of lead damage the brain and nerves in fetuses and young children, resulting in learning deficits and a lowered intelligence quotient. Lead exposure causes high blood pressure and increases heart disease, especially in men. Lead exposure may also lead to anemia. Wild and domestic animals can ingest lead while grazing. They experience the same kind of effects as people who are exposed to lead. Low concentrations of lead can slow down vegetation growth near industrial facilities. Lead can enter water systems through runoff and from sewage and industrial waste streams. Elevated levels of lead in the water can cause reproductive damage in some aquatic life and cause blood and neurological changes in fish and other aquatic animals.

4.6.1.2 Proposed Action Construction Impacts

Construction emissions sources include fugitive dust emissions from excavation and earthwork. The Station Proposed Action would have construction emissions associated with the construction of pipeline for water supply, power plant, coal handling facilities, solid waste disposal facilities, and substations. During construction, temporary and localized increases in ambient concentrations of nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compounds, and PM_{10} would result from exhaust emissions of workers' vehicles, heavy construction equipment, diesel generators, and other machinery tools.

Appendix A, *Best Management Practices,* describes BMPs that would be implemented as an integral part of the proposed Station to minimize or avoid the potential for impacting air quality. For the duration of Station construction activities, actively disturbed areas would be stabilized through the use of water spray. Other measures to minimize dust emissions would include graveling of roadways, limitation of vehicle speeds on roadways, and minimization of duration that areas are disturbed.

Because limited technical data are available for the heavy equipment to be used to construct the Station facilities, a very conservative (assumed high) emission estimate of construction-related emissions was prepared using the emission estimates from the EIS for the Toquop Energy Project (Toquop) (BLM, 2003). Both fugitive dust emissions and the tailpipe exhaust emissions from the Toquop EIS were scaled up using the ratio of amount of land disturbed.

Construction of the Proposed Action power plant, switch yard, and coal storage facility would disturb approximately 510 acres. Construction of the solid waste disposal facility would disturb about 405 acres. Construction of the cooling towers would disturb some 95 acres of land. Collectively, the construction area that would be disturbed would total 1,010 acres. In addition, emissions were estimated from construction of 3 miles of access roads and 1 mile of railroad spur.

In addition to fugitive dust emissions, on-road and off-road vehicles would generate gaseous exhaust emissions during Station construction. Mobile emissions are functions of hours of operation, vehicle speed, vehicle type, and fuel burned. Because limited technical data are available for the Station, emissions were assumed to be proportional to the area of construction. Estimates from the Toquop EIS (BLM, 2003) were scaled up to calculate exhaust emissions from vehicles. Toquop emissions estimates were prepared using the emission factor for generalized construction activities from the California Air Resources Board *Emission Inventory Procedural Manual* (California Air Resources Board, 1997) and EPA document AP-42, Volume II, Emission Factors for Mobile Sources (EPA, 1995). Tables 4.6-1 and 4.6-2 summarize the short term and total emissions of carbon monoxide, nitrogen oxides, PM_{10}, and sulfur dioxide. The three construction scenarios described in Section 2.2.4.2, *Construction Schedule and Workforce*, were reviewed to identify the scenario that has maximum ambient air impact. Of the three options the worst-case scenario is where Units 1, 2, and 3 are constructed concurrently. The construction of all three units concurrently would result in the utilization of maximum number of off-road vehicles and also result in the largest amount of land disturbed in the shortest period of time. Emission calculation methodology assumes 61 months for construction of the power plant and 6 months for construction of ancillary facilities. Annual emissions calculations assume an average schedule of 10 hours per day and 5 days per week.

TABLE 4.6-1

Emissions During the Station Construction Phase

	Particulate (PM_{10}) (pounds per hour)	Carbon Monoxide (pounds per hour)	Sulfur Dioxide (pounds per hour)	Nitrogen Oxides (pounds per hour)
Power plant	61.6	10.0	7.9	52.9
Access roads	23.6	19.7	18.1	27.8
Rail spur	7.9	6.6	6.0	9.3
Solid waste disposal facility	41.2	6.6	5.4	7.9
Water pipeline	15.0	3.3	2.7	4.0
Wells	1.6	2.5	2.3	2.3

Note: Emissions scaled on the basis of the ratio of estimated disturbed area at the proposed Toquop and White Pine Energy Station power plant sites.

TABLE 4.6-2

Total Emissions During the Station Construction Phase

	Particulate (PM_{10}) (tons)	Carbon Monoxide (tons)	Sulfur Dioxide (tons)	Nitrogen Oxides (tons)
Power plant	407.1	65.8	52.5	349.3
Access road	15	13	12	18
Rail spur	5	4	4	6
Solid waste disposal facility	27	4	4	5
Water pipeline	10	2	2	3
Wells	1	2	2	1

Note: Emissions based on construction of the White Pine Energy Station power plant in 61 months and other ancillary facilities in six months. Annual emissions calculations assume an average schedule of 10 hours per day and 5 days per week.

Although no dispersion modeling was performed to determine the ambient impact of these estimated construction emissions, based on relatively low unit emission rates, the large acreage over which the emission sources would be dispersed, and results of similar modeling performed at other projects, it is predicted that the impact of these emissions would not cause ambient impacts that would exceed or approach the particulate NAAQS.

4.6.1.3 Proposed Action Operation Impacts

4.6.1.3.1 Air Emission Sources

The Proposed Action would include construction of a 1,590-MW coal-fired electric generating station. The facility would consist of up to three units, each with a supercritical pulverized coal fired boiler and a steam turbine generator, and would include three natural draft dry cooling towers. The power plant would have several point sources and fugitive sources of emissions of regulated pollutants. Emission sources during project operation would include:

- Pulverized coal boilers
- Distillate oil fired auxiliary boiler
- Coal unloading and handling facilities
- Active and inactive coal piles
- Fly ash handling and storage facilities
- Lime unloading, handling, and storage facilities
- Paved and unpaved roadways
- Emergency diesel engine driven emergency generator and firewater pump
- Locomotive emissions

The pulverized coal boilers, auxiliary boilers, and generator would cause air emissions of the criteria pollutants nitrogen oxides, carbon monoxide, sulfur dioxide, PM_{10}, and volatile organic compounds. Minor quantities of hazardous air pollutants (HAPs) would also be emitted. Coal, flyash, and lime handling facilities would cause PM_{10} emissions. Paved and unpaved roads would also cause PM_{10} emissions. Locomotives transporting coal to the power plant site would cause nitrogen oxides, carbon monoxide, PM_{10}, sulfur dioxide, and volatile organic compound emissions.

4.6.1.3.2 Air Emission Controls

The proposed control technologies for the pulverized coal boilers are summarized in Table 4.6-3. For the auxiliary boiler, low sulfur distillate oil would be used to minimize emissions of sulfur dioxide and sulfuric acid. The use of low-nitrogen oxide burners and flue gas recirculation would minimize nitrogen oxides emissions, and good combustion practices would minimize fugitive emissions.

4.6.1.3.3 Magnitude of Emissions During Operation

Emissions from the Station would be regulated by state and federal air pollution permits. A facility must apply for and obtain a permit prior to commencement of construction under the PSD program. This is required by the Clean Air Act, and administered by the NDEP in Nevada. Maximum estimated emissions of criteria air pollutants from the Station stated in the PSD permit application are shown in Table 4.6-4.

Estimated locomotive emissions for transporting coal by the NNR from Shafter to the power plant site are shown in Table 4.6-5. These emissions are noted separately here because, as mobile sources not on the property of the project itself, the locomotive emissions are not covered under the PSD permit analysis required by the Clean Air Act. The emissions calculations were made assuming that 12 trains per week deliver coal from Shafter to the power plant site (total round trip distance of approximately 200 miles). Each train is assumed to have three locomotives each equipped with diesel engines (6,000 brake horsepower for each locomotive), and is conservatively assumed to be operating at full throttle (and thus full emissions output) for the entire distance. The diesel fuel was assumed to contain a maximum of 500 ppm sulfur. Average speed of the train was assumed to be 40 miles per hour. No dispersion modeling was performed for these emissions. However, because of the comparatively small total estimated emissions, and large geographic area over which the emissions would occur, the railroad emissions are predicted to have minimal ambient impact.

TABLE 4.6-3

Proposed Control Technologies for Pulverized Coal Boilers

Control technology	Pollutants Controlled
Good combustion practices	Carbon monoxide and volatile organic compound
Low-nitrogen oxide burners, overfire air and selective catalytic reduction (SCR)	Nitrogen oxides
Spray dyer absorber (dry scrubber)	Sulfur dioxide, HF, sulfuric acid, and mercury
Fabric filter baghouse	PM, PM_{10}, sulfuric acid, lead, and mercury
Halogenated activated carbon injection	Mercury

HF = hydrogen fluoride

TABLE 4.6-4

Total Facility Estimated Emission of Criteria Pollutants

Pollutant	Emissions (pound per hour)	Emissions (tons/year)
Nitrogen oxides	1,165	4,761
Carbon monoxide	2,367	10,174
Volatile organic compound	60	245
Sulfur dioxide	1,387	6,108
PM_{10}	633	2,664
Lead	0.28	0.81

TABLE 4.6-5

Estimated Emissions for Operation of Railroad Locomotive

Pollutant	Potential-to-Emit (tons/year)
Carbon monoxide	79
Nitrogen oxides	805
Sulfur dioxide	1.1
PM	20
Volatile organic compounds	30

Notes:
1. Emission factor from USEPA Publication “Emission Factors for Locomotives” December 1997 EPA420-F-97-051.

2. Potential to emit calculations assume 12 trains per week.

3. Sulfur dioxide emissions factor from USEPA publication AP-42, Compilation of Air Pollutant Emission Factors, Section 3.4 Table 3.4-1. Diesel fuel assumed to have 500 ppm sulfur.

4.6.1.3.4 Dispersion Modeling Methodology

Dispersion modeling was performed using the EPA-approved air quality dispersion models, which are mathematical descriptions of atmospheric diffusion and dispersion processes that can be used to predict pollutant impacts over a given area. Modeling was conducted in accordance with NDEP and EPA specified procedures, and was approved by the NDEP Bureau of Air Quality as part of the PSD permit process.

4.6.1.3.5 Class II Area Dispersion Modeling Results

Dispersion modeling of the maximum potential emissions from the White Pine Energy Station was performed for nitrogen oxides, carbon monoxide, PM_{10}, sulfur dioxide and lead using the EPA-approved AERMOD model. Predicted impacts are compared to the "PSD Increment," which is the maximum allowable ambient air quality deterioration allowed under the PSD program. Predicted impacts are also compared to the NAAQS, which are the pollutant concentrations below which, as determined by the EPA, no adverse human health or environmental impacts are presumed to occur.

Table 4.6-6 presents the predicted maximum impacts from the Station Proposed Action and compares them to the PSD Increment and NAQQS. The values represent the highest results modeled at any receptor location for any of the meteorological conditions modeled. Table 4.6-7 presents the sources considered in addition to the Station Proposed Action in this analysis.

TABLE 4.6-6
Results of Full Impact Analysis

Pollutant	Averaging Time	Modeled Maximum (WPEA) Air Impact Concentrations ($\mu g/m^3$)	Class II Area SIL ($\mu g/m^3$)	Cumulative Increment Consumption ($\mu g/m^3$)	PSD Increments ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
PM_{10}	24-hour	24.8	5	25.3	30	55.3	150
PM_{10}	Annual	7.4	1	7.5	17	17.5	50
Sulfur dioxide	3-hour	88.7	25	26.2	512	305	1,300
Sulfur dioxide	24-hour	17.4	5	73.0	91	81.0	365
Sulfur dioxide	Annual	2.0	1	6.5	20	9.2	80
Carbon monoxide	1-hour	433	2,000	NA	NA	NA	40,000
Carbon monoxide	8-hour	88.8	500	NA	NA	NA	10,000
Nitrogen dioxide	Annual	1.4	1	1.4	25	3.3	100
Lead	Quarterly	0.0009	NA	NA		NA	NA

$\mu g/m^3$ = micrograms per cubic meter

TABLE 4.6-7

Source Inventory for Increment and NAAQS Modeling

			Nitrogen Oxides	PM_{10}		Sulfur Dioxide	
ID	State	Facility	tons per year	pounds per year	tons per year	pounds per year	tons per year
373	Nevada	Robinson Nevada Mining Company	28.31	104.43	107.37	5.47	4.24
405	Nevada	Newmont Gold Company	--	7.96	23.4	--	--
543	Nevada	J&M Trucking -Ely	--	0.83	0.66	--	--
713	Nevada	Homestake Mining Company	--	0.01	0.06	--	--
835	Nevada	Reck Brothers	10.28	3.57	3.57	0.92	0.93
1065	Nevada	Nevada Slag	10.69	6.91	3.84	7.42	6.97
1124	Nevada	Reed Distributing	--	0.002	0.01	--	--
1177	Nevada	J&M Trucking -Eureka	--	0.57	0.92	--	--
1336	Nevada	Bald Mountain Mine - Mooney	--	0.20	0.83	--	--
1362	Nevada	Bald Mountain Mine - Huntington	2.56	0.35	1.49	0.0006	0.003
1377	Nevada	Cooper & Sons	14.11	5.85	4.61	4.95	4.45
1417	Nevada	Country Construction	--	3.30	1.2	--	--
1466	Nevada	White Pine County Schools	1.44	2.1	3.27	0.11	0.16
1594	Nevada	Chevron Environmental Mgt Co.	1.83				
10706	Utah	U.S. Army- Dugway Proving Ground	--	--	--	5.24	22.94
		Total	**68.2**	**136**	**151**	**24.1**	**39.7**

Estimates of incremental ozone concentration from the proposed Station were evaluated based on accepted screening level methodology. Rigorous analysis of ozone impacts is not possible without access to regional grid modeling, which has not been previously prepared by the agencies for this region. Based on the screening techniques, the Station is expected to have a near zero (significantly less than 0.08 ppb) contribution to ambient air ozone concentration based on its volatile organic compound-to-nitrogen oxides ratio. The Station is not predicted to cause or significantly contribute to a violation of the ozone standard.

A number of historic and new Wilderness areas are in the vicinity of the proposed Station. The four closest to the site are the Goshute Canyon, Becky Peak, and Bristlecone Wilderness Areas administered by the BLM, and the High Schells Wilderness administered by the USFS. Isopleths (a line on a map connecting points at which a given variable has a specified constant value) of Class II dispersion modeling results were examined to determine whether the proposed Station would have an impact on the wilderness areas. This analysis demonstrates that the Station would not have a significant impact on Goshute Canyon, Becky Peak, or Bristlecone. Impacts of nitrogen dioxide, PM_{10}, carbon monoxide, and annual sulfur dioxide were also shown to be insignificant at High Schells. Impacts of 24-hour and 3-hour sulfur dioxide are significant over small portions of High Schells, but were less than 10 percent of the applicable PSD increments.

The Humboldt-Toiyabe National Forest was contacted to identify the closest designated roadless area to the proposed power plant site. Based on information provided by the Humboldt-Toiyabe National Forest, there currently is no designated roadless area on USFS lands in Nevada.

Although modeling of emissions from the Proposed Station site did not include receptors at the potential stellar observatory sites in Western Utah, several conclusions can be drawn regarding the potential impacts to visibility based on the relative location of the sites and the modeling performed at the Class I areas. One of the observatories is proposed to be located near Tooele, Utah and the other between Delta and Milford, Utah. The first is approximately 164 miles northeast of the Station site, and the second is about 110 miles east-southeast of the Station site.

Impacts analyses for Great Basin National Park were used to extrapolate information regarding impacts to the observatories. Modeled visibility impacts at the nearby (approximately 40 miles) Great Basin National Park indicated that perceptible changes in visibility resulting from the Station could occur on approximately 0.6 percent of the days in the worst-case year (see discussion of Calpuff modeling for Class II areas in the following section for Class I modeling). The perceptible change in visibility was calculated against relatively pristine background conditions at the park.

The prevailing winds at the Station site are from the south-southwest, which indicates that air-borne pollutants that could contribute to visibility degradation would travel toward the Tooele location more frequently than the Milford-Delta location. However, because the proposed observatory sites are considerably farther downwind than Great Basin National Park, it is likely that the frequency and magnitude of the visibility impacts would be considerably less than the modeled values at Great Basin National Park. In addition, the Tooele location likely has less than pristine background conditions because of its proximity to an urban area and the pollutants associated with urban sources. Therefore, perceptible changes as compared to background conditions would be less despite the additional dispersion afforded by the longer travel distance.

4.6.1.3.6 Class II Cumulative Impact Analysis

As noted above, Table 4.6-6 presents a cumulative Class II impact analysis based on the permitted projects and projects deemed to have the potential for significant contribution to ambient pollutant concentrations in the areas where the Station Proposed Action is also predicted to have significant contribution, as per PSD permitting guidelines. The potential cumulative impacts on the Class II areas in the vicinity of the proposed Station considering reasonably foreseeable future projects were also evaluated. Potential cumulative effects of the NNR upgrade and operation, White Pine County Airport Expansion, Basset Lake Expansion, Intermountain Power Project Phase III, Newmont Gold Coal-Fired Power Plant, Toquop Energy Coal-Fired Power Plant, and Ely Energy Center were considered for further evaluation. The NNR is described in Section 2.2.3.7.1, *Rehabilitation and Operation of Nevada Northern Railway,* and the other projects are described in Section 4.19.2, *Description of Projects Considered for Cumulative Analysis.*

4.6.1.3.7 Class II Area Hazardous Air Pollutants

Ambient impacts of HAP emissions were estimated by prorating the AERMOD modeling results for the criteria pollutants based on the ratios of HAP emission rates to criteria emission rates for each pollutant and each source. Reasonable but conservative estimates for 8-hour, 24-hour, and annual average HAP concentrations are presented in Table 4.6-8. Estimated HAP concentrations (predicted ambient impact) were compared to available federal human health exposure guidelines based on exposure duration.

The estimated 8-hour average HAP concentrations were compared to the EPA acute exposure guideline levels (AEGL-1, AEGL-2). The estimated 24-hour average concentrations were compared to the Agency for Toxic Substances and Disease Registry Minimal Risk Levels. Minimal Risk Levels were derived based on exposures that occur over a 1- to 14-day time frame and are available for 12 HAPs. The estimated annual average HAP concentrations were compared to the EPA Prioritized Chronic Dose-Response. Chronic Dose response numbers are available for 52 chemicals.

As shown in Table 4.6-8, none of the estimated HAP concentrations exceed the available standards, based on the appropriate exposure term. Therefore, even if residences were located in close proximity to the Station site, it is very unlikely that the estimated HAP concentrations would result in an unacceptable risk to the occupants of those residences.

4.6.1.3.8 Class I Area Dispersion Modeling Results

Air quality and air quality related values impacts at the nearest federally designated Class I areas have been evaluated. Modeled Class I area impacts have been compared to the PSD Class I area increments, and modeled air quality related values impacts (visibility and deposition) have been compared to threshold levels established by the Federal Land Managers (FLMs). This section presents the approaches used and the results obtained for the Class I area air impact analysis.

The following Class I areas were identified by the FLM for inclusion in the air quality and air quality related values analysis:

- Zion National Park, for which the USDOI National Park Service is the applicable FLM
- Jarbidge Wilderness Area, for which the USFS is the applicable FLM

Zion National Park and Jarbidge Wilderness Area are located approximately 300 kilometers to the south-southeast and 260 kilometers to the north of the proposed Station, respectively. Because portions of Zion National Park are further than 300 kilometers from the proposed Station, the air quality and air quality related values impacts were only assessed at receptors in Zion within 300 kilometers of the proposed Station.

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

Compound	Predicted Ambient Impact: 8-Hour Average Concentration (μg/m³)	Predicted Ambient Impact: 24-Hour Average Concentration (μg/m³)	Predicted Ambient Impact: Annual Average Concentration (μg/m³)	EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] (μg/m³)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] (μg/m³)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] (μg/m³)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
Acetaldehyde	6.18E-02	2.05E-02	2.39E-03	NA[c]	No	NA[c]	No	0.45	No
Acenapthene	5.53E-05	1.84E-05	2.14E-06	NA[c]	No	NA[c]	No	NA[c]	No
Acenapthylene	2.71E-05	9.01E-06	1.05E-06	NA[c]	No	NA[c]	No	NA[c]	No
Acetophenone	1.63E-03	5.40E-04	6.29E-05	NA[c]	No	NA[c]	No	NA[c]	No
Acrolein	3.14E-02	1.04E-02	1.22E-03	69.0	No	0.11	No	0.02	No
Anthracene	2.28E-05	7.56E-06	8.81E-07	NA[c]	No	NA[c]	No	NA[c]	No
Antimony	2.49E-03	8.27E-04	9.63E-05	NA[c]	No	NA[c]	No	NA[c]	No
Arsenic[d]	4.54E-03	1.51E-03	1.76E-04	NA[c]	No	NA[c]	No	2.33E-04	No
Benzene	1.41E-01	4.68E-02	5.45E-03	2.90E+04	No	160.0	No	1.28E-01	No
Benzoanthracene	8.67E-06	2.88E-06	3.35E-07	NA[c]	No	NA[c]	No	9.10E-03	No
Benzopyrene	4.12E-06	1.37E-06	1.59E-07	NA[c]	No	NA[c]	No	9.09E-04	No
Benzofluoranthene	1.19E-05	3.96E-06	4.61E-07	NA[C]	No	NA[c]	No	9.09E-04	No
Benzoperylene	2.93E-06	9.73E-07	1.13E-07	NA[c]	No	NA[c]	No	NA[c]	No
Benzyl chloride	7.59E-02	2.52E-02	2.94E-03	NA[c]	No	NA[c]	No	0.02	No
Beryllium	3.73E-03	1.24E-03	1.44E-04	NA[c]	No	NA[c]	No	4.17E-04	No
Biphenyl	1.84E-04	6.12E-05	7.13E-06	NA[c]	No	NA[c]	No	NA[c]	No
Bis(2-ethylhexyl)phthalate	7.91E-03	2.63E-03	3.06E-04	NA[c]	No	NA[c]	No	4.17E-01	No
Bromoform	4.23E-03	1.40E-03	1.64E-04	NA[c]	No	NA[c]	No	0.91	No
1,3-Butadiene				NA[c]	No	NA[c]	No	0.33	No
Cadmium	5.87E-04	1.95E-04	2.27E-05	NA[c]	No	NA[c]	No	5.56E-04	No
Carbon disulfide	1.41E-02	4.68E-03	5.45E-04	6200.0	No	NA[c]	No	700.0	No
Chromium VI[e]	1.61E-03	5.37E-04	6.25E-05	NA[c]	No	NA[c]	No	8.33E-05	No

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

Compound	Predicted Ambient Impact: 8-Hour Average Concentration ($\mu g/m^3$)	Predicted Ambient Impact: 24-Hour Average Concentration ($\mu g/m^3$)	Predicted Ambient Impact: Annual Average Concentration ($\mu g/m^3$)	EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] ($\mu g/m^3$)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] ($\mu g/m^3$)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] ($\mu g/m^3$)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
Chrysene	1.08E-05	3.60E-06	4.19E-07	NA[c]	No	NA[c]	No	0.091	No
2-Chloroacetophenone	7.59E-04	2.52E-04	2.94E-05	NA[c]	No	NA[c]	No	0.03	No
Chlorobenzene	2.38E-03	7.92E-04	9.22E-05	NA[c]	No	NA[c]	No	1000.0	No
Chloroform	6.39E-03	2.13E-03	2.47E-04	NA[c]	No	490.0	No	98.0	No
Cobalt	8.89E-03	2.95E-03	3.44E-04	NA[c]	No	NA[c]	No	0.10	No
Cumene	5.74E-04	1.91E-04	2.22E-05	NA[c]	No	NA[c]	No	400.0	No
Cyanide	2.31E-02	7.68E-03	8.94E-04	NA[c]	No	NA[c]	No	NA[c]	No
2,4-Dinitrotoluene	3.03E-05	1.01E-05	1.17E-06	NA[c]	No	NA[c]	No	1.10E-02	No
Dimethyl sulfate	5.20E-03	1.73E-03	2.01E-04	45.0	No	NA[c]	No	NA[c]	No
Ethylbenzene	1.02E-02	3.39E-03	3.94E-04	NA[c]	No	NA[c]	No	1000.0	No
Ethyl chloride	4.55E-03	1.51E-03	1.76E-04	NA[c]	No	4.00E+04	No	1.00E+04	No
Ethylene dichloride	4.34E-03	1.44E-03	1.68E-04	NA[c]	No	NA[c]	No	3.80E-02	No
Ethylene dibromide	1.30E-04	4.32E-05	5.03E-06	NA[c]	No	NA[c]	No	1.70E-03	No
Fluorene	9.86E-05	3.28E-05	3.82E-06	NA[c]	No	NA[c]	No	NA[c]	No
Formaldehyde	2.60E-02	8.65E-03	1.01E-03	1100.0	No	49.0	No	9.80	No
Hexane	7.26E-03	2.41E-03	2.81E-04	NA[c]	No	NA[c]	No	200.0	No
Hydrochloric Acid	3.73E+00	1.24E+00	2.81E-04	2.70E+03	No	NA[c]	No	20.0	No
Hydrofluoric Acid	1.72E+00	5.71E-01	4.61E-02	8.20E+02	No	25	No	14.0	No
Indeno(1,2,3-cd)pyrene	6.61E-06	2.20E-06	2.56E-07	NA[c]	No	NA[c]	No	9.10E-03	No
Isophorone	6.29E-02	2.09E-02	2.43E-03	NA[c]	No	NA[c]	No	3.70	No
Lead	2.13E-02	7.09E-03	8.25E-04	NA[c]	No	NA[c]	No	1.50	No
Manganese	2.31E-01	7.68E-02	8.94E-03	NA[c]	No	NA[c]	No	0.05	No

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

Compound	Predicted Ambient Impact: 8-Hour Average Concentration (μg/m^3)	Predicted Ambient Impact: 24-Hour Average Concentration (μg/m^3)	Predicted Ambient Impact: Annual Average Concentration (μg/m^3)	EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] (μg/m^3)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] (μg/m^3)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] (μg/m^3)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
Mercury	3.93E-03	1.30E-03	1.52E-04	NA[c]	No	NA[c]	No	0.30	No
5-Methyl chrysene	2.38E-06	7.92E-07	9.22E-08	NA[c]	No	NA[c]	No	9.09E-04	No
Methyl bromide	1.73E-02	5.76E-03	6.71E-04	2.60E+05	No	190.0	No	5.0	No
Methyl chloride	5.74E-02	1.91E-02	2.22E-03	NA[c]	No	1000.0	No	90.0	No
Methyl ethyl ketone	4.23E-02	1.40E-02	1.64E-03	5.90E+05	No	NA[c]	No	5.00E+03	No
Methyl hydrazine	1.84E-02	6.12E-03	7.13E-04	390.0	No	NA[c]	No	NA[c]	No
Methyl methacrylate	2.17E-03	7.20E-04	8.39E-05	7.00E+04	No	NA[c]	No	7.00E+02	No
Methyl tert butyl ether	3.79E-03	1.26E-03	1.47E-04	NA[c]	No	7200.0	No	3.85	No
Methylene chloride	3.14E-02	1.04E-02	1.22E-03	NA[c]	No	2100.0	No	2.13	No
Napthalene	1.41E-03	4.68E-04	5.45E-05	NA[c]	No	NA[c]	No	0.03	No
Nickel	2.49E-02	8.27E-03	9.63E-04	NA[c]	No	NA[c]	No	0.09	No
Phenanthrene	2.93E-04	9.73E-05	1.13E-05	NA[c]	No	NA[c]	No	NA[c]	No
Phenol	1.73E-03	5.76E-04	6.71E-05	2.40E+04	No	NA[c]	No	2.00E+02	No
Propylene Oxide				2.60E+04	No	NA[c]	No	0.27	No
Propionaldehyde	4.12E-02	1.37E-02	1.59E-03	NA[c]	No	NA[c]	No	NA[c]	No
Pyrene	3.58E-05	1.19E-05	1.38E-06	NA[c]	No	NA[c]	No	NA[c]	No
Tetrachoroethlylene	4.66E-03	1.55E-03	1.80E-04	NA[c]	No	NA[c]	No	NA[c]	No
1,1,1-Trichloroethane	2.17E-03	7.20E-04	8.39E-05	NA[c]	No	NA[c]	No	NA[c]	No
Toluene	2.60E-02	8.65E-03	1.01E-03	7.50E+05	No	3.80E+03	No	400.0	No
Selenium	3.55E-03	1.18E-03	1.38E-04	NA[3]	No	NA[c]	No	20.00	No
Styrene	2.71E-03	9.01E-04	1.05E-04	8.50E+04	No	NA[c]	No,	1.00E+03	No
Vinyl acetate	8.24E-04	2.74E-04	3.19E-05	NA[c]	No	NA[c]	No	2.00E+02	No

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

	Predicted Ambient Impact								
Compound	8-Hour Average Concentration (μg/m³)	24-Hour Average Concentration (μg/m³)	Annual Average Concentration (μg/m³)	EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] (μg/m³)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] (μg/m³)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] (μg/m³)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
Xylene (m,p)	4.01E-03	1.33E-03	1.55E-04	NA[c]	No	NA[c]	No	NA[c]	No
Xylene (o)	4.01E-03	1.33E-03	1.55E-04	NA[c]	No	NA[c]	No	NA[c]	No
Xylene (total)	4.01E-03	1.33E-03	1.55E-04	5.60E+05	No	4300.0	No	100.0	No
2,3,7,8-TCDD	1.55E-09	5.15E-10	6.00E-11	NA[c]	No	NA[c]	No	3.03E-08	No

Notes:

[a] EPA, 2005a, Table 2. Acute Dose-Response Values for Screening Risk Assessments
AEGL-2 used in lieu of missing AEGL-1 values; AEGL-1 = Guideline levels for "mild effects", AEGL-2 = Guideline levels for "moderate effects".

[b] EPA, 2005b Table 1 Prioritized Chronic Dose-Response Values
Chronic Inhalation values chosen as the more conservative of the two categories: "Non-Cancer" and "Cancer"

[c] NA = Value is not available for this compound.

[d] Arsenic concentrations based on coal analysis from 12 PRB coal mines anticipated to be the source of fuel for this project.

[e] Chromium emission factor based USEPA Emission Factor Documentation for AP-42, Section 1.1, Reference Facility #27

Approach

The CALPUFF modeling system was used to estimate air quality and air quality related values impacts at the two Class I areas. CALPUFF is the only EPA accepted model for prediction of impacts at receptors at distances greater than 50 kilometers from the source. The model was originally designed for receptors of up to 200 kilometers from the source, although it has been commonly applied to receptors up to 300 kilometers from the source. Use of the model for distances between 200 kilometers and 300 kilometers has thus resulted in scientific debate regarding the validity of the results, with concern that impacts may be significantly overpredicted. The basic procedures used in the Class I area air quality and air quality related values impact assessment followed FLM and Federal guidance:

- **Modeling Period.** 3 years of meteorological data (1996, 2001, and 2002) were used.
- **Source of MM5 Data.** The 1996 36-kilometer MM5 data developed by EPA and used by WRAP for their Section 309 SIP modeling were used as input for the 1996 annual modeling. The 2001 MM5 data were developed by the EPA at 36-kilometer resolution for the continental U.S. For 2002, MM5 data were developed by the WRAP for the western U.S.
- **Observed Meteorological Data.** Observed surface and upper-air National Weather Service meteorological data within and nearby the CALPUFF modeling domain were acquired, subjected to quality assurance, and reformatted for input into the CALPUFF meteorological model (CALMET).
- **Modeling Domain and Configuration.** The extent of the modeling domain was defined based on an examination of the sources and receptors of interest. In the direction from the proposed Station to the Jarbidge Wilderness Area and Zion National Park Class I areas, a minimum 350-kilometer distance was included in the domain to allow at least a 50-kilometer buffer past the furthest receptors of interest. The modeling domain was defined using a Lambert Conformal Conic Projection. A 1-kilometer grid resolution was used.
- **CALMET Parameters.** CALMET parameters were defined following the standard default CALMET application with enhancements based on best judgment from experienced CALMET modelers.
- **CALPUFF Parameters.** Standard default CALPUFF parameters for PSD applications were specified. Background ammonia was defined following EPA's Inter-Agency Work Group on Air Quality Modeling (IWAQM) guidance. Hourly surface ozone measurements based on EPA's Air Quality Stations network available from AIRS were used in the analysis. Other CALPUFF parameters were defined using the standard regulatory default settings.

The modeling domain extended 428 kilometers in the east-west direction and 660 kilometers in the north-south direction. A 1-kilometer grid resolution was used to better resolve the complex terrain in the region, resulting in a 428 by 660 horizontal grid for the CALMET meteorological modeling. The horizontal grids were defined using a Lambert Conformal Conic Projection with a projection origin of 40.0 degrees north latitude and 97.0 degrees west longitude and standard parallels at 33 and 45 degrees.

Meteorological Inputs. For the 1996, 2001, and 2002 CALMET application, surface and upper-air meteorological observations for 4 sites and precipitation observations from approximately 70 sites were provided as inputs.

Modeling Receptors. Receptors for the Jarbidge Wilderness Area and Zion National Park were taken from the National Park Service (NPS) website at http://www2.nature.nps.gov/ air/maps/Receptors/.

The NPS receptor database yielded 174 receptors for the Jarbidge Wilderness Area and 51 receptors for Zion National Park, respectively.

Background Pollutant Concentrations. The CALPUFF model requires the input of background ozone and ammonia for the chemical conversion. Hourly ozone data from sites within the modeling domain from EPA's AIRS compliance network were used in the CALPUFF refined analysis.

The IWAQM guidance contains the following recommended background ammonia concentrations for three categories of land use type, as follows:

- 10.0 ppb for grasslands
- 0.5 ppb for forested lands
- 1.0 ppb for arid lands

Based on the EPA IWAQM Guidance document reference: Phase II Summary Report for Modeling Long Range Transport Impacts (EPA-454/R-98-019) and in consultation with NPS, FS, and FLMs a background value of 1.0 ppb for ammonia was applied in the modeling analysis.

Emissions. Emissions from the two proposed boiler stacks were considered in the analysis. Emission rates for sulfur dioxide, primary particulate sulfate (SO_4), oxides of nitrogen; and particulate matter (PM) emissions of elemental carbon (EC), organic carbon (OC), other fine particulate ($PM_{2.5}$), and coarse particulate (PM_{10}) were used in the CALPUFF modeling analysis. The stack parameters and (maximum allowable) emission rates used in the modeling are given in Tables 4.6-9 and 4.6-10.

TABLE 4.6-9

Stack Parameters Used in the Modeling Analysis

Height (meters)	Elevation (meters)	Diameter (meters)	Exit Velocity (meters per second)	Exit Temperature (Kelvin)
182.9	1825.0	9.57	19.81	347.6
182.9	1825.0	6.77	19.81	347.6

TABLE 4.6-10

Emission Rates Used in the Modeling Analysis *

	Sulfur Dioxide	SO_4	Nitrogen Oxides	$PM_{2.5}$	EC	OC	PM_{10}
Stack 1	924.0	36.0	730.0	73.70	2.98	204.0	76.60
Stack 2	462.0	18.0	365.0	36.85	1.49	102.0	38.34

* Values expressed in pounds per hour

Versions of the CALPUFF Modeling System. Version 5.5 Level 030402 of CALMET and Version 5.7 Level 030402 of CALPUFF were used in the analysis.

CALMET Options. The CALMET options used in the analysis for 1996, 2001, and 2002 are provided in the modeling protocol prepared for this study with updates based on comments from the FLMs. A few of the key specifications for the CALMET modeling were:

- Use of a Lambert Conformal Conic Projection system at 1 kilometer horizontal resolution
- Use of 10 vertical layers
- Observations from 4 surface and 4 upper-air meteorological stations and 73 precipitation stations
- Extrapolate surface winds aloft using similarity theory (IEXTRP=-4)
- Use of Diagnostic Wind Model (DWM) for generating wind fields (IWFCOD=1)
- Use of MM5 data as an initial guess field for the DWM (IPROG=14)

CALPUFF Options. The CALPUFF options used in the Class I area modeling are provided in the modeling protocol prepared for this study. Some of the key options include the following:

- Use same modeling domain as CALMET
- Gaussian puff representation
- MESOPUFF-II transformation rates (MCHEM=1)
- Dry and wet deposition modeled (MDRY=1)
- PG dispersion coefficients for rural areas (MDISP=3)
- Technical options must conform to USEPA Long Range Transport (LRT) guidance (MREG=1)

CALPUFF Modeling Results

The CALPUFF results for air quality and air quality related values are presented in this section. The results are compared against threshold levels that are either not to be exceeded (for example, PSD increments) or are levels that when exceeded raise concerns and should be evaluated for their significance (for example, visibility thresholds). The results are first presented using the basic FLAG (Federal Land Managers Air Quality Related Values Work Group Phase 1 Report, December 2000) procedures following IWAQM and EPA guidance, followed by an examination of the frequency, magnitude, and duration of the impacts.

Threshold Levels: PSD Pollutants. EPA has proposed established Class I area threshold concentration levels for sulfur dioxide, nitrogen dioxide, and PM_{10} concentrations as part of the PSD program. The FLMs have also developed threshold levels for visibility and sulfur and nitrogen deposition at Class I areas.

As part of EPA's PSD policy, Class I and Class II area concentration increments have been established. The cumulative air quality impacts of all new sources are required to be below the PSD Class I increments. In 1996, EPA published a Federal Register notice of proposed Class I area significant impact level (SIL) thresholds for a single project. These proposed SILs are defined as being approximately 4 percent of the PSD Class I area increment. If a project's impact is below the Class I area single project proposed SIL thresholds, then its impacts are interpreted to be insignificant. If the project's estimated impact exceeds the Class I SIL, then a cumulative impact analysis is run to determine the total impact of the project plus surrounding sources of air pollution. If this cumulative analysis indicates total impacts are less than the Class I area PSD concentration increment, then the project impacts are acceptable. However, if total impacts exceed the increment, then the frequency, magnitude, and duration of such impacts are examined to determine whether the project is the driving factor in the exceedance. Finally, if a project's estimated impact exceeds the Class I area PSD concentration increment, or is shown to be a driving factor in a cumulative exceedance, then the project must perform mitigation to achieve impacts below the PSD increment. Table 4.6-11 lists the PSD increments and SIL concentration thresholds for Class I areas.

Threshold Levels: Deposition. The FLAG procedures require estimation of total sulfur deposition from the CALPUFF-estimated wet and dry sulfur dioxide and SO_4 deposition. For nitrogen, wet and dry deposition from all of the nitrogen modeled species are included (nitrogen oxides, nitric acid, and particulate nitrate).

The NPS has posted a document "Guidance on Nitrogen and Sulfur Deposition Analysis Thresholds" on their Website. The NPS DATs for nitrogen and sulfur deposition are as follows:

East DAT: 0.010 kg/ha/yr
West DAT: 0.005 kg/ha/yr

East and west refer to Class I areas east and west of the Mississippi River. The western U.S. DATs are applicable to the Station. Table 4.6-12 lists the sulfur and nitrogen deposition thresholds that the Station deposition estimates were compared against.

TABLE 4.6-11

Class I Area Single Source Significant Impact Levels (SIL) and Cumulative Sources PSD Increments for Class I Areas

Species and Averaging Time	Class I Area Thresholds: Proposed SIL ($\mu g/m^3$)	Class I Area Thresholds: PSD Increment ($\mu g/m^3$)
Sulfur dioxide annual	0.10	2.00
Sulfur dioxide 24-hour	0.20	5.00
Sulfur dioxide 3-hour	1.00	25.00
PM_{10} annual	0.20	4.00
PM_{10} 24-hour	0.30	8.00
Nitrogen dioxide annual	0.10	2.50

TABLE 4.6-12

Department of Interior National Park Service (NPS) Sulfur and Nitrogen Deposition Analysis Thresholds (DATs)

Class I Area	Average Deposition: Sulfur (kg-S/ha/yr)	Average Deposition: Nitrogen (kg-N/ha/yr)
NPS DAT	0.005	0.005

Threshold Levels: Visibility. The FLAG workgroup recommends procedures for estimating the visibility impacts because of proposed new sources at Class I areas using refined CALMET/CALPUFF modeling. The FLAG visibility metric is the estimated maximum 24-hour change in extinction over clean natural visibility conditions at the Class I area. The FLAG thresholds for extinction change over natural background are as follows:

- If the source's visibility impact is less than 0.4 percent on all days, the source is considered insignificant and the FLM will not object to the permit.
- If the source's visibility impact is less than 5 percent on all days, the FLM will likely not object to the permit.
- If there are days when the source's visibility impact is greater than 10 percent, the FLM may object to the permit.
- If there are days in which the source's visibility impact is above 5 percent, the frequency, magnitude, and duration of the visibility impacts are examined to make a significance determination.
- If a source exceeds a specific threshold at a Class I area, then the frequency, magnitude, and duration of the impacts are examined to interpret the modeling results. More recent interpretation of the FLAG procedures for evaluating the visibility impacts estimated by the CALPUFF modeling system has allowed the introduction of extenuating circumstances that account for natural obscuration of visibility.

Relative humidity adjustment factors [f(RH)] for refined CALPUFF modeling calculations can be made using hourly (MVISBK=2) and monthly average (MVISBK=6) f(RH) values. The natural conditions used in the project's visibility assessment are based on clean conditions with no man-made or weather interference. The inclusion of the occurrence of natural weather influence in the visibility calculations (for example, fog, rain, snow, etc.) has been allowed in Class I area visibility assessments.

PSD Pollutant Concentrations. Table 4.6-13 lists the CALPUFF estimated PSD pollutant concentrations resulting from Station emissions at the Jarbidge Wilderness Area and Zion National Park and compares them with the PSD Class I increments and proposed single source SILs. The CALPUFF-estimated concentration impacts because of the Station are always well below (less than 10 percent of) the Class I area PSD concentration increments. The Station's estimated concentrations at the Class I areas are also below the proposed Class I area single-source SIL for most PSD pollutants and averaging times. The exceptions are for estimated 3-hour and 24-hour average sulfur dioxide concentrations that exceed the proposed SIL at both the Jarbidge and Zion Class I areas.

The applicable regulations (40 CFR §52.21 and 40 CFR Part 51, Appendix W) are ambiguous regarding whether the first-high concentration or the design value (the second-high concentration for short-term averaging periods, as is used for some pollutants for the increment and NAAQS analysis) is compared to the SIL to determine the pollutants and averaging periods for which a cumulative analysis is conducted. Thus, air permitting agencies have the discretion to accept either methodology in a permitting action. In the interest of providing additional information for this EIS, Table 4.6-14 reports cumulative analysis results for each pollutant and averaging period for which a predicted first-high concentration exceeds the corresponding single-source SIL. Thus, the cumulative analysis, including impact of the Station and other regional emission sources, was conducted for 3-hour and 24-hour sulfur dioxide for all 3 years for both Class I areas, with the exception of 24-hour sulfur dioxide at Zion National Park for 1996.

TABLE 4.6-13

CALPUFF Estimated PSD Pollutant Concentrations Impacts at Class I Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields and with Puff Splitting

	Class I Area Thresholds		CALPUFF at Class I Areas (Highest 1st High Concentration)	
Species and Averaging Time	**Proposed SIL ($\mu g/m^3$)**	**PSD Increment ($\mu g/m^3$)**	**Jarbidge ($\mu g/m^3$)**	**Zion ($\mu g/m^3$)**
1996				
Sulfur dioxide annual	0.10	2.00	0.0039	0.0065
Sulfur dioxide 24-hour	0.20	5.00	0.48	0.19
Sulfur dioxide 3-hour	1.00	25.00	1.41	1.01
PM_{10} annual	0.20	4.00	0.0004	0.0005
PM_{10} 24-hour	0.30	8.00	0.045	0.016
Nitrogen dioxide annual	0.10	2.50	0.0009	0.0020
2001				
Sulfur dioxide annual	0.10	2.00	0.0151	0.0059
Sulfur dioxide 24-hour	0.20	5.00	0.56	0.42
Sulfur dioxide 3-hour	1.00	25.00	1.58	1.13
PM_{10} annual	0.20	4.00	0.0014	0.0004
PM_{10} 24-hour	0.30	8.00	0.047	0.011
Nitrogen dioxide annual	0.10	2.50	0.0036	0.0014
2002				
Sulfur dioxide annual	0.10	2.00	0.0117	0.0054
Sulfur dioxide 24-hour	0.20	5.00	0.57	0.21
Sulfur dioxide 3-hour	1.00	25.00	1.75	1.15
PM_{10} annual	0.20	4.00	0.0011	0.0005
PM_{10} 24-hour	0.30	8.00	0.05	0.018
Nitrogen dioxide annual	0.10	2.50	0.0038	0.0013

TABLE 4.6-14

CALPUFF Estimated Short-Term Sulfur Dioxide PSD Pollutant Concentrations at Class I Areas for the White Pine Energy Station Plus Cumulative Sulfur Dioxide Sources Using 1-Kilometer CALMET Meteorological Fields, 1.0 ppb Background Ammonia and without Puff Splitting

Species and Averaging Time	Class I Area Thresholds PSD Increment ($\mu g/m^3$)	Cumulative Sulfur Dioxide CALPUFF at Class I Areas (Highest 2nd High Concentration) Jarbidge	Zion
1996			
Sulfur dioxide 24-hour	5.00	0.95	N/A
Sulfur dioxide 3-hour	25.00	2.02	3.98
2001			
Sulfur dioxide 24-hour	5.00	0.55	0.60
Sulfur dioxide 3-hour	25.00	1.75	2.90
2002			
Sulfur dioxide 24-hour	5.00	0.58	0.66
Sulfur dioxide 3-hour	25.00	1.85	3.17

The cumulative sulfur dioxide impacts analysis demonstrates no exceedances of the Class I PSD increment at either Jarbidge Wilderness Area or Zion National Park.

Effects of Puff Splitting. It is generally believed that CALPUFF results over large transport distances (approximately 300 kilometers and beyond) may be overly conservative without puff splitting because the effects of wind shear are underestimated. The results for the CALPUFF-estimated highest second high 3-hour and 24-hour sulfur dioxide concentrations at the Jarbidge Class I area with and without using puff splitting are shown in Table 4.6-15. Also shown in Table 4.6-15 is the percent difference of the estimated highest second high concentrations at the Jarbidge Wilderness Area, where positive differences indicate the puff spitting produces higher concentrations than without puff splitting and negative percent differences indicate that puff splitting produces lower concentrations than without puff splitting. Puff splitting in CALPUFF for the Station has from essentially no effect to exacerbating the possible CALPUFF overestimation bias when puff splitting was not used. Thus, at least for the conditions of the Station and Class I areas studied and the 3 years of modeling data, the possible CALPUFF overestimation bias is not mitigated by puff splitting.

Visibility Impacts. The visibility impacts were first calculated from the refined CALPUFF modeling results following the procedures in the FLAG final report, which include:

- Current IMPROVE extinction equation.
- Use of hourly relative humidity adjustment factors [f(RH)] as provided in the CALPUFF modeling system.
- Use of clean natural conditions for background that use estimates of clean aerosol conditions and do not account for weather interference (for example, fog, rain, snow) or other natural phenomena (smoke from fires, aerosols from sea salt, volcanoes).

TABLE 4.6-15

Comparison of the Highest Second High CALPUFF-Estimated 3-Hour and 24-Hour Sulfur dioxide Concentrations at the Jarbidge Class I Area from White Pine Energy Station Emissions Running CALPUFF with and without Using Puff Splitting

Rank	With Puff Splitting ($\mu g/m^3$)	Without Puff Splitting ($\mu g/m^3$)	Difference With - Without (percent)
3-Hour Sulfur Dioxide			
1996	1.1738	1.1404	+2.9 percent
2001	1.4626	1.3363	+9.5 percent
2002	1.7034	1.6714	+1.9 percent
24-Hour Sulfur Dioxide			
1996	0.2361	0.2311	-2.1 percent
2001	0.4355	0.4390	-0.8 percent
2002	0.3732	0.3585	+4.1 percent

At the request of NPS/USFS, there were two revisions made to the FLAG visibility impact procedures that are typically used in more recent Class I area impact assessments:

- Use of latest EPA default RH curves rather than the older FLAG values.
- Use of a maximum relative humidity (RHMAX) value of 95 percent compared to the 98 percent value recommended in FLAG.

Another enhancement to the FLAG guidance used in this study was the speciation of the Station's PM_{10} emissions into its PM components: SO_4, elemental carbon (EC), organic carbon (OC), fine particles ($PM_{2.5}$), and coarse particles ($PM_{2.5-10}$). The extinction properties of the individual PM components are greater than used for total PM_{10} so this speciation provides a more refined and conservative estimate of the visibility impacts than assuming the emissions are entirely PM_{10}.

Table 4.6-16 summarizes the number of days that the maximum daily CALPUFF estimated visibility impacts over natural conditions at the Jarbidge Wilderness Area and Zion National Park exceed the 5 percent and 10 percent thresholds during the 3 years of modeling. On a vast majority of modeling days (approximately 98 percent for Jarbidge and 99 percent for Zion) the proposed Station is estimated to have no visibility impact at either of the two Class I areas.

Relative Humidity and Particle Growth. The effects of relative humidity (RH) and particle growth on the CALPUFF-estimated visibility impacts at the two Class I areas were examined two ways:

- Use of monthly average f(RH) values as recommended in EPA's Best Available Retrofit Technology (BART) guidance for calculating visibility from aerosol concentrations; and
- Use of the latest f(RH) values from EPA guidance instead of the older values in the CALPUFF modeling system.

TABLE 4.6-16

CALPUFF Estimated Maximum Daily Extinction Estimates at Class I Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields, with Puff Splitting and Using the Basic FLAG Procedures for Visibility Calculations (Using 1.0 PPB Background NH3)

	Class I Area Visibility Impacts		
	Number of Days >5 percent	Number of Days >10 percent	Maximum Change (percent)
Jarbidge Wilderness Area			
1996	9	4	22.4
2001	15	8	29.8
2002	8	4	32.3
Zion National Park			
1996	2	1	10.6
2001	3	0	6.3
2002	4	0	7.7

Table 4.6-17 lists the number of days the CALPUFF-estimated visibility at the two Class I areas exceeds the 5 percent and 10 percent thresholds using hourly CALPUFF f(RH), using monthly average f(RH) (MVISBK=6), and using hourly f(RH) values from EPA guidance. The CALPUFF modeling system f(RH) values are generally the most conservative, estimating more days that exceed the 5 percent and 10 percent visibility thresholds than the other two methods. The number of days exceeding the 5 percent threshold at Zion National Park is reduced from 9 using the CALPUFF hourly f(RH) values to 2 using the monthly f(RH) values. The number of days exceeding the 10 percent threshold as Jarbidge Wilderness Area remains unchanged at 16 with the monthly f(RH).

Effects of Natural Obscuration. The issue of natural effects on the background in visibility assessments has been discussed and there have been various procedures proposed for incorporating weather interference (for example, presence of atmospheric liquids water content) and other natural obscuration phenomena (for example, sea salt) in the natural background. In fact, one of the options in the CALPUFF modeling system for assessing visibility impacts uses observed background visibility including weather effects (MVISBK=7) rather than estimates of natural background (clean aerosol concentrations) with no weather interference.

Table 4.6-18 lists the hourly surface weather observations for February 4, 1996. This is a period that yielded one of the highest raw modeled impacts at the Jarbidge Wilderness Area. On this day, local weather observations indicate that light rain or snow is falling for 13 of 24 hours in the day. When accounting for this naturally occurring water in the natural background, the presence of just one hour of rain or snow would increase the 24-hour average natural background extinction by over a factor of ten. As a result, the calculated visibility impacts on this day would be less than 5 percent. Thus, when accounting for rain/snow in the visibility background, the change in extinction over natural background would be reduced to below the 5 percent threshold.

TABLE 4.6-17

Sensitivity of White Pine Energy Station CALPUFF Estimated Visibility Impacts at Class I Areas to Relative Humidity (RH) Including Original Hourly CALPUFF f(RH), Monthly Average f(RH), and Updated Hourly f(RH) Values from EPA Guidance

	Hourly CALPUFF f(RH)			Monthly f(RH)			EPA Guidance Monthly f(RH)		
	Number of Days > 5%	Number of Days >10%	Max %	Number of Days > 5%	Number of Days >10%	Max %	Number of Days > 5%	Number of Days >10%	Max %
Jarbidge Wilderness Area									
1996	9	4	22.4	7	4	23.5	9	5	21.2
2001	15	8	29.8	15	7	22.7	15	8	27.4
2002	8	4	32.3	8	5	21.9	8	4	28.5
Zion National Park									
1996	2	1	10.6	1	0	7.2	2	0	9.7
2001	3	0	6.3	1	0	7.0	3	0	6.3
2002	4	0	7.7	0	0	4.0	3	0	7.2

TABLE 4.6-18

Summary of Hourly Surface Meteorological Observations at National Weather Service Site Nearest to the Jarbidge Wilderness Area Class I Area on February 4, 1996

Site	Date	Hour	Rain/Snow Showers?	T (F)	RH (percent)	Sky Cover (tenths)
24128	2/4/1996	0		26	75	Overcast
24128	2/4/1996	1		25	81	Overcast
24128	2/4/1996	2		26	75	Overcast
24128	2/4/1996	3		27	75	Overcast
24128	2/4/1996	4		26	78	Overcast
24128	2/4/1996	5	Yes	27	78	Overcast
24128	2/4/1996	6	Yes	28	82	Overcast
24128	2/4/1996	7		28	85	Overcast
24128	2/4/1996	8	Yes	29	92	Overcast
24128	2/4/1996	9	Yes	30	89	Overcast
24128	2/4/1996	10	Yes	30	92	Overcast
24128	2/4/1996	11	Yes	31	96	Overcast
24128	2/4/1996	12	Yes	32	92	Overcast
24128	2/4/1996	13	Yes	32	96	Overcast
24128	2/4/1996	14	Yes	33	96	Overcast
24128	2/4/1996	15	Yes	33	96	Overcast
24128	2/4/1996	16	Yes	33	96	Overcast
24128	2/4/1996	17	Yes	33	96	Overcast

TABLE 4.6-18

Summary of Hourly Surface Meteorological Observations at National Weather Service Site Nearest to the Jarbidge Wilderness Area Class I Area on February 4, 1996

Site	Date	Hour	Rain/Snow Showers?	T (F)	RH (percent)	Sky Cover (tenths)
24128	2/4/1996	18		33	96	7
24128	2/4/1996	19		33	100	Overcast
24128	2/4/1996	20		33	96	0
24128	2/4/1996	21		33	100	7
24128	2/4/1996	22		33	100	3
24128	2/4/1996	23		34	96	3

Examination of the weather occurrences during the days greater than 5 percent at the Jarbidge Wilderness Area and Zion National Park reveals that rain and/or snow was falling at the closest weather station for many of the estimated adverse visibility days. These events are summarized in Table 4.6-19. For these days, background visibility would be naturally obscured, and any impact from the Station would be reduced below the 5 percent threshold.

Summary of Visibility Impacts. Table 4.6-20 summarizes the CALPUFF-estimated visibility impacts at the Jarbidge Wilderness Area and Zion National Park using: (1) the CALPUFF hourly f(RH); (2) the EPA Guidance hourly f(RH); (3) the EPA Guidance monthly f(RH); and (4) accounting for the effects for rain/snow. Using monthly f(RH) values and EPA natural conditions, there are 28 days at the Jarbidge Wilderness Area and 2 days at Zion National Park that exceed the 5 percent threshold using 3 years of modeling. When eliminating days where weather indicates natural obscuration (rain, etc.) and using monthly f(RH), there are 21 days at the Jarbidge Wilderness Area and 2 days at the Zion National Park that exceed the 5 percent threshold.

TABLE 4.6-19

Weather Interference Events During Estimated Adverse Visibility Days

Date	Year/Julian Date	Comment
Jarbidge Wilderness Area Class I Area		
02/04/96	96035	13 Hours of rain/snow
02/17/96	96048	1 Hour of rain
06/26/96	96178	8 Hours of rain
10/30/96	96304	5 Hours of rain
01/08/01	01008	8 Hours of rain
01/11/01	01011	9 Hours of rain
01/24/01	01024	4 Hours of rain/snow
01/26/01	01026	8 Hours of snow
11/12/01	01316	1 Hour of rain
12/29/01	01363	3 Hours of snow

TABLE 4.6-19

Weather Interference Events During Estimated Adverse Visibility Days

Date	Year/Julian Date	Comment
12/30/01	01364	1 Hour of rain
01/02/02	02001	2 Hours of rain, some moderate
09/16/02	02260	2 Hours of rain, some moderate
Zion National Park Class I Area		
01/29/01	01302	9 Hours of snow
11/23/01	01327	7 Hours of rain
04/08/02	02098	5 Hours of rain, some moderate
10/03/02	02276	6 Hours of rain
10/31/02	02304	4 Hours of snow

TABLE 4.6-20

Summary of Estimated Visibility Impacts at the Jarbidge Wilderness Area and Zion National Park Using CALPUFF f(RH) Factors, EPA's f(RH) Factors, Monthly f(RH) Factors, and Accounting for Rain and Snow in the Visibility Backgrounds

						Percent Change in Extinction over Natural Background (percent)			
Year	Day	REC	BEXT	BKG	BEXT (tot)	CALPUFF f(RH)	EPA f(RH)	Monthly f(RH)	Monthly f(RH) and Natural Obscuration
Jarbidge Wilderness Area									
1996	35	165	3.59	16.041	19.631	22.38	20.31	14.59	<<5
1996	48	156	1.029	15.227	16.256	6.76	6.09	4.70	<5
1996	178	1	1.288	15.644	16.932	8.23	7.75	4.95	<<5
1996	284	94	0.956	14.893	15.849	6.42	6.40	7.75	7.75
1996	304	15	3.023	16.648	19.671	18.16	15.24	5.91	<<5
1996	314	94	0.78	14.881	15.661	5.24	5.65	6.97	6.97
1996	315	65	3.006	14.928	17.934	20.14	21.15	23.45	23.45
1996	316	156	1.465	14.873	16.338	9.85	10.76	12.00	12.00
1996	317	156	1.968	14.855	16.823	13.25	14.22	16.54	16.54
2001	8	165	3.292	15.349	18.641	21.45	17.6	11.41	11.41
2001	9	18	1.719	15.838	17.556	10.85	9.11	5.52	5.52
2001	21	156	0.871	15.03	15.901	5.79	6.26	7.88	7.88
2001	22	79	1.504	15.007	16.51	10.02	10.35	11.77	11.77
2001	23	4	2.395	15.038	17.433	15.92	16.5	18.56	18.56
2001	24	18	4.565	15.299	1.864	29.84	27.41	22.68	<<5
2001	26	1	2.495	15.537	18.032	16.06	13.93	10.12	10.12
2001	63	52	1.442	14.957	16.399	9.64	10.39	10.62	10.62

TABLE 4.6-20

Summary of Estimated Visibility Impacts at the Jarbidge Wilderness Area and Zion National Park Using CALPUFF f(RH) Factors, EPA's f(RH) Factors, Monthly f(RH) Factors, and Accounting for Rain and Snow in the Visibility Backgrounds

						Percent Change in Extinction over Natural Background (percent)			
Year	**Day**	**REC**	**BEXT**	**BKG**	**BEXT (tot)**	**CALPUFF f(RH)**	**EPA f(RH)**	**Monthly f(RH)**	**Monthly f(RH) and Natural Obscuration**
2001	309	156	1.557	14.872	16.428	10.47	11.43	12.62	12.62
2001	310	165	1.155	14.868	16.023	7.77	8.48	8.54	8.54
2001	314	94	0.765	14.795	15.561	5.17	5.52	7.62	7.62
2001	315	79	0.754	14.854	15.608	5.08	5.38	7.05	<5
2001	316	165	0.931	14.988	15.919	6.21	6.26	7.99	<5
2001	363	156	3.194	15.997	19.191	19.96	16.24	8.90	<<5
2001	364	165	1.586	16.202	17.791	9.81	7.84	4.02	<5
2002	2	4	5.027	15.56	20.587	32.31	28.46	21.88	<5
2002	47	4	1.13	14.814	15.943	7.63	7.86	11.79	11.79
2002	259	165	0.923	15.573	16.496	5.92	5.66	3.68	<5
2002	325	156	1.654	15.561	17.215	10.63	10.38	9.64	9.64
2002	334	1	1.499	14.875	16.374	10.08	11.05	13.40	13.40
2002	340	18	1.512	15.03	16.542	10.06	10.69	12.45	12.45
2002	341	165	0.934	14.77	15.704	6.33	6.93	10.37	10.37
2002	343	156	0.968	14.882	15.85	6.5	7.16	9.72	9.72
Zion National Park									
1996	6	188	1.597	15.08	16.677	10.59	9.65	7.19	7.19
1996	76	221	0.881	14.994	15.876	5.88	5.97	4.56	4.56
2001	29	225	0.975	15.81	16.786	6.17	5.0	2.79	<<5
2001	327	221	1.045	16.61	17.656	6.29	5.17	2.51	<<5
2001	361	221	0.873	14.947	15.82	5.84	6.26	7.02	7.02
2002	98	223	1.272	16.534	17.806	7.69	6.05	1.87	<<5
2002	276	214	1.027	18.013	19.04	5.7	4.58	1.36	<<5
2002	304	210	1.164	15.818	16.982	7.36	7.18	4.06	<<5
2002	307	225	1.118	15.363	16.482	7.28	6.4	3.88	3.88

Deposition. The CALPOST postprocessor can provide estimates of annual dry and wet deposition for each modeled species at each receptor. CALPOST was run to provide annual total dry and wet deposition in units of g/m^2/s for sulfur dioxide, SO_4, nitrogen oxides, HNO_3, and NO_3 species at each receptor in the Jarbidge Wilderness Area and Zion National Park Class I areas. The deposition values were averaged across all receptors in each Class I area to estimate area-wide average deposition for each Class I area. Units of the annual deposition were then converted from g/m^2/s to kg/ha/yr for comparison with thresholds. The deposition for each of the sulfur species (sulfur dioxide and SO_4) and nitrogen species (nitrogen oxides, HNO_3, and NO_3) was converted to deposition of sulfur or nitrogen, respectively, and then summed to estimate total sulfur or nitrogen deposition. These results are presented in Tables 4.6-21 and 4.6-22 for the Jarbidge Wilderness Area and in Tables 4.6-23 and 4.6-24 for Zion National Park.

TABLE 4.6-21

Nitrogen Deposition (kg-N/ha/yr) Averaged Across the Jarbidge Wilderness Area for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.000134	0.000000	
HNO_3	0.000164	0.000032	
NO_3	0.000005	0.000056	
Total nitrogen	0.000303	0.000088	0.000391
2001			
Nitrogen oxides	0.000490	0.000000	
HNO_3	0.000480	0.001351	
NO_3	0.000021	0.000536	
Total nitrogen	0.000991	0.001887	0.002878
2002			
Nitrogen oxides	0.000556	0.000000	
HNO_3	0.000381	0.000989	
NO_3	0.000014	0.001065	
Total nitrogen	0.000951	0.002054	0.003005

TABLE 4.6-22

Sulfur Deposition (kg-S/ha/yr) Averaged Across the Jarbidge Wilderness Area for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.001149	0.000171	
SO_4	0.000016	0.000196	
Total sulfur	0.001165	0.000367	0.001532
2001			
Sulfur dioxide	0.003771	0.008283	
SO_4	0.000043	0.001398	
Total sulfur	0.003814	0.009681	0.013495
2002			
Sulfur dioxide	0.003081	0.012206	
SO_4	0.000031	0.002418	
Total sulfur	0.003112	0.014624	0.017736

TABLE 4.6-23

Nitrogen Deposition (kg-N/ha/yr) Averaged Across Zion National Park for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.000413	0.000000	
HNO_3	0.000271	0.000143	
NO_3	0.000010	0.000564	
Total nitrogen	0.000694	0.000707	0.001401
2001			
Nitrogen oxides	0.000387	0.000000	
HNO_3	0.000249	0.000275	
NO_3	0.000028	0.000562	
Total nitrogen	0.000664	0.000837	0.001501
2002			
Nitrogen oxides	0.000342	0.000000	
HNO_3	0.000237	0.000195	
NO_3	0.000030	0.000283	
Total nitrogen	0.000609	0.000478	0.001087

TABLE 4.6-24

Sulfur Deposition (kg-S/ha/yr) Averaged Across Zion National Park for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.002695	0.003106	
SO_4	0.000022	0.000515	
Total sulfur	0.002717	0.003621	0.006338
2001			
Sulfur dioxide	0.002665	0.006181	
SO_4	0.000052	0.001082	
Total sulfur	0.002717	0.007263	0.009980
2002			
Sulfur dioxide	0.002337	0.002640	
SO_4	0.000048	0.000834	
Total sulfur	0.002485	0.003474	0.005959

Estimated annual total nitrogen deposition because of Station emissions at the two Class I areas ranges from 0.00039 to 0.00301 kg-N/ha/yr, which is below the NPS western U.S. Deposition Analysis Threshold (DAT) of 0.005 kg-N/ha/yr.

At the Jarbidge Wilderness Area, the estimated annual total sulfur deposition is below the NPS western U.S. DAT (0.005 kg-S/ha/yr) for 1996 (0.0015 kg-S/ha/yr). However, for 2001 and 2002, the estimated total sulfur deposition (0.013 and 0.018 kg-S/ha/yr) at the Jarbidge Wilderness Area is above the NPS western U.S. DAT (0.005 kg-S/ha/yr). At Zion National Park, the estimated sulfur deposition levels (ranging from 0.006 to 0.010 kg-S/ha/yr) exceed the western U.S. DAT for all 3 modeling years. It should be noted that impacts in excess of a DAT do not necessarily represent an adverse impact, but do indicate a management concern.

NPS Comments to PSD Permit Application Regarding Class I Impacts. The NPS has submitted comments to NDEP on WPEA's PSD permit application (NPS, January 31, 2007). The NPS comments include the following findings from NPS analysis of WPEA's modeling results included in the application:

- The modeling indicates that the Class I PSD increments for sulfur dioxide and nitrogen oxides are not violated at Zion National Park.
- Visibility at Zion National Park would not be adversely affected by the emissions from WPEA alone.
- Visibility at Great Basin National Park would be significantly affected by the emissions from WPEA alone.
- Sulfur deposition from WPEA exceeds the NPS Deposition Analysis Threshold at Zion National Park. However, there is currently no information to indicate that sulfur would acidify aquatic or terrestrial ecosystems in the park.
- It is likely that both sulfur and nitrogen deposition from WPEA exceeds the NPS DATs at Great Basin National

Park, with potential impacts to aquatic and terrestrial ecosystems.

- The impacts of WPEA's emissions upon visibility in Zion National Park are not adverse.
- The impacts of WPEA's emissions upon visibility in Great Basin National Park are significant.

Further, the NPS comments recommend WPEA reconsider using integrated gasification combined cycle (IGCC) technology or make more effective use of the control technologies chosen for the pulverized coal boilers. NPS further recommends that a Continuous Emissions Monitor (CEM) be installed upon startup of the Station. Finally, the NPS has recommended to NDEP that sufficient emission reductions could be secured from other sources in the area to further mitigate WPEA's potential impacts at Great Basin and Zion National Parks. The BLM will look to NDEP as the air permitting regulatory agency to determine if a PSD permit will be issued and what conditions will be imposed. In the event that NDEP issues a final PSD permit for the White Pine Energy Station prior to publication of the Final EIS, the terms and conditions of said permit will be included in the Final EIS.

Additional Class II Area Impacts Analysis. The CALPUFF Modeling System was also used to estimate impacts for two Class II areas, Ruby Lake National Wildlife Refuge (RLNW) and Great Basin National Park (GRBA). Tables 4.6-25 through 4.6-30 summarize results of those comparisons.

TABLE 4.6-25

CALPUFF Estimated PSD Pollutant Concentrations Impacts at the Great Basin National Park (GRBA) and Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields and With Puff Splitting

	Class II Area Thresholds		CALPUFF Estimates*	
Species and Averaging Time	NAAQS ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)	GRBA	RLNW
1996				
Sulfur dioxide annual	80	20	0.0798	0.0157
Sulfur dioxide 24-hour*	365	91	1.1403	0.4693
Sulfur dioxide 3-hour*	NA	512	4.2910	1.6955
PM_{10} annual	50	17	0.0058	0.0016
PM_{10} 24-hour*	150	30	0.0806	0.0484
Nitrogen dioxide annual	100	25	0.0402	0.0028
2001				
Sulfur dioxide annual	80	20	0.0922	0.0158
Sulfur dioxide 24-hour*	365	91	1.4677	0.5680
Sulfur dioxide 3-hour*	NA	512	4.7192	2.6470
PM_{10} annual	50	17	0.0069	0.0012
PM_{10} 24-hour*	150	30	0.1080	0.0522
Nitrogen dioxide annual	100	25	0.0447	0.0047

TABLE 4.6-25

CALPUFF Estimated PSD Pollutant Concentrations Impacts at the Great Basin National Park (GRBA) and Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields and With Puff Splitting

	Class II Area Thresholds		CALPUFF Estimates*	
Species and Averaging Time	**NAAQS ($\mu g/m^3$)**	**PSD Increment ($\mu g/m^3$)**	**GRBA**	**RLNW**
2002				
Sulfur dioxide annual	80	20	0.1090	0.0140
Sulfur dioxide 24-hour*	365	91	1.1867	5.2527
Sulfur dioxide 3-hour*	NA	512	4.1846	2.5534
PM_{10} annual	50	17	0.0085	0.0014
PM_{10} 24-hour*	150	30	0.0945	0.0438
Nitrogen dioxide annual	100	25	0.0532	0.0042

* Highest second high at any receptor in the GRBA or RLNW area for short-term (not annual) impacts.

TABLE 4.6-26

CALPUFF Estimated Maximum Daily Extinction Estimates at the Great Basin National Park (GRBA) and Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the White Pine Energy Station*

	Class II Area Visibility Impacts		
	# Days > 5%	**# Days >10%**	**Max Change (%)**
Great Basin (GRBA)			
1996	37	16	20.34
2001	40	20	27.94
2002	51	21	32.29
Ruby Lake (RLNW)			
1996	10	4	17.06
2001	11	4	26.52
2002	9	2	16.80

* Using 1 kilometer CALMET Meteorological Fields, with puff splitting and using the basic FLAG procedures for visibility calculations.

TABLE 4.6-27

Nitrogen Deposition (kg-N/ha/yr) Averaged Across the Great Basin National Park (GRBA) Area for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.009549	0.000000	
HNO_3	0.002213	0.002375	
NO_3	0.000127	0.005416	
Total nitrogen	0.011889	0.007791	0.019680
2001			
Nitrogen oxides	0.010949	0.000000	
HNO_3	0.002434	0.001435	
NO_3	0.000148	0.004229	
Total nitrogen	0.013531	0.005664	0.019195
2002			
Nitrogen oxides	0.011850	0.000000	
HNO_3	0.002302	0.001216	
NO_3	0.000230	0.003748	
Total nitrogen	0.004382	0.004964	0.009346

TABLE 4.6-28

Nitrogen Deposition (kg-N/ha/yr) Averaged Across the Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.000687	0.000000	
HNO_3	0.001551	0.000189	
NO_3	0.000022	0.000023	
Total nitrogen	0.002260	0.000212	0.002472
2001			
Nitrogen oxides	0.000996	0.000000	
HNO_3	0.000855	0.001444	
NO_3	0.000041	0.002722	
Total nitrogen	0.001892	0.004166	0.006058
2002			
Nitrogen oxides	0.000846	0.000000	
HNO_3	0.000847	0.000770	
NO_3	0.000021	0.000656	
Total nitrogen	0.001714	0.001426	0.003140

TABLE 4.6-29

Sulfur Deposition (kg-S/ha/yr) Averaged Across the Great Basin National Park (GRBA) Class II Area for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.035897	0.033707	
SO_4	0.000172	0.006238	
Total sulfur	0.036069	0.039945	0.076014
2001			
Sulfur dioxide	0.041610	0.017386	
SO_4	0.000215	0.005542	
Total sulfur	0.041825	0.022928	0.064753
2002			
Sulfur dioxide	0.043625	0.016974	
SO_4	0.000266	0.004998	
Total sulfur	0.043891	0.021972	0.065863

TABLE 4.6-30

Sulfur Deposition (kg-S/ha/yr) Averaged Across the Ruby Lake National Wildlife Refuge (RLNW) Class II Area for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.009611	0.001249	
SO_4	0.000081	0.000405	
Total sulfur	0.009692	0.001654	0.011346
2001			
Sulfur dioxide	0.007523	0.018682	
SO_4	0.000065	0.003332	
Total sulfur	0.007588	0.022014	0.029602
2002			
Sulfur dioxide	0.006726	0.005065	
SO_4	0.000045	0.001067	
Total sulfur	0.006771	0.006132	0.012903

In all cases, modeled WPEA pollutant concentrations at Ruby Lake and Great Basin are less than 2 percent of the PSD increment and less than 1 percent of the applicable NAAQS. Perceptible (greater than 5 percent) changes in visibility are indicated for approximately 12 percent of the modeled days for Great Basin and approximately 3 percent of the modeled days for Ruby Lake. Sulfur and nitrogen deposition in excess of the NPS DATs is also indicated for both Great Basin and Ruby Lake. It should be noted that impacts in excess of a DAT do not necessarily represent an adverse impact, but do indicate a management concern.

4.6.1.3.9 Greenhouse Gas Emissions

As with any fossil-fuel fired project, WPEA will contribute to global emissions of green house gasses, including carbon dioxide, methane, and nitrous oxide. Of these three, carbon dioxide contributes more than 98 percent of the total green house gasses impact. Table 4.6-31 compares estimated carbon monoxide emissions for the proposed Station with similar sized subbituminous coal fired subcritical pulverized coal boiler and natural gas fired combined cycle power plants. The comparison was made using WPEA design heat rate, estimated typical heat rates for subcritical pulverized coal and combined cycle natural gas power plants, and emission factors stated in EPA Climate Leaders program guidance documents.

4.6.1.4 Proposed Action Mitigation

As noted above, the ambient impact analyses performed for the Station demonstrate that the estimated impacts are within the standards that are deemed to be protective of human health and the environment. One area of concern is in regards to predicted impacts on visibility within Jarbidge Wilderness Area and Zion National Park during conditions that have historically occurred for a small fraction of the time. Visibility and acid deposition impacts within Great Basin National Park are also of concern.

As part of the PSD permitting process, NDEP and EPA have the responsibility for assessment of Station impacts and specification of any mitigating actions deemed necessary to protect air quality. NDEP issued a draft air permit for WPEA in December 2006 and required no further mitigation of visibility impacts as part of that permit.

To enable the BLM to monitor compliance by the Station operators with the terms and conditions of the NDEP issued Class I Air Quality Permit and to identify any unanticipated effects to air quality, WPEA shall simultaneously submit to BLM and NDEP all monitoring and other reports required under the Class I Air Quality Permit for the White Pine Energy Station issued by the Nevada Division of Environmental Protection.

TABLE 4.6-31

Green House Gas Comparison

Emission Source	Pollutant	Power Plant Capacity MW - net	Heat Rate Btu/nkW-hr	Hourly Emission Rate (pounds per hour)	Annual Emission Rate (tons /year)
Station proposed action	Carbon dioxide	1,590	9,856	4,596,201	20,131,362
Subcritical pulverized coal fired boiler	Carbon dioxide	1,590	10,000	4,663,354	20,425,489
Combined cycle gas fired power plant	Carbon dioxide	1,590	7,500	1,311,750	5,745,465

Note: Emission estimated based on EPA Climate Leaders program guidance document for Stationary Combustion Sources.

4.6.1.5 Alternative 1

4.6.1.5.1 Impacts

The Station Alternative 1 power plant site is approximately 12 miles south of the Station Proposed Action power plant site and approximately 22 miles north of Ely. There are slight differences in the air impact analysis at the two sites, but terrain and meteorology are similar between the two sites. Impacts of other existing sources of air pollution also were evaluated for both sites. Based on these criteria, a qualitative conclusion is that differences in air quality impacts between the Station Proposed Action and Alternative 1 should not be significantly different and mitigation measures would not be required. However, the Alternative 1 power plant site is closer to human receptors and to the Robinson Mine near Ruth. The BLM's preferred alternative (the Station Proposed Action) is presumed to have more acceptable impacts because of the greater distance from human receptors and particulate emissions from the mine. The Alternative 1 power plant site is also approximately half the distance to the Bristlecone and High Schells Wilderness areas versus the Proposed Action power plant site, and as such it is likely to have higher ambient pollutant impacts; as such, the Proposed Action is again presumed to be preferable. It is important to note that if Station Alternative 1 is selected, a revised PSD air permit application providing quantitative modeling and analysis of impacts from operations at the Alternative 1 power plant site would be required by the Clean Air Act.

4.6.1.5.2 Mitigation

Mitigation required for Alternative 1 is the same as described for the Proposed Action.

4.6.1.6 Connected Actions

4.6.1.6.1 SWIP

Transmission line construction would cause a temporary increase in particulate matter (airborne dust), primarily from constructing new roads, upgrading existing roads, moving heavy construction equipment, and traveling to and from construction sites. Gaseous emissions from construction vehicles would be temporary, disperse quickly, and likely be far below NAAQS (BLM, 1993). Air quality impacts from operating the transmission system would include dust and emissions from maintenance checkups and emergency activities (for example, repair a fallen transmission line). Air quality impacts would not be significant during transmission line construction or operation as long as mitigation measures are implemented. Mitigation measures proposed include limiting construction during periods of strong winds, using water to control dust during construction, and maintaining vehicles to prevent excessive exhaust emissions (BLM, 1993).

4.6.1.6.2 NNR

The reinstatement of freight rail service on the NNR would generate pollutant emissions during the construction phase and to a lesser extent during rail operation. Air quality impacts during construction are expected to be short-term and would cease when restoration activities are completed. Because of the distance of the NNR to adjacent developments, these emissions are not expected to adversely affect adjacent residents or sensitive receptors (David Evans and Associates, Inc., 2002). Air quality impacts from the reinstatement of freight rail service are expected to be minimal. Because of the projected low level of rail traffic on the NNR (up to four trains per day, on average), emissions during NNR operation would not be large enough to cause the area to violate sulfur dioxide or ozone standards (David Evans and Associates, Inc., 2002). Long-term train emissions would not result in significant adverse regional or local air quality impacts (David Evans and Associates, Inc., 2002). Estimated locomotive emissions associated with the transport of coal via the NNR to the Station power plant were described in Section 4.6.1.3.3, *Magnitude of Emissions During Operation*, and were predicted to have minimal ambient impact.

4.6.1.7 No Action Alternative

No Station-related impacts on air quality would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.6.2 Noise

This analysis addresses potential temporary noise impacts from Station construction, noise from steam blowouts prior to normal operation of the proposed power plant, and potential noise impacts from Station operation.

4.6.2.1 Proposed Action

4.6.2.1.1 Impacts

Construction

Construction activities would result in a temporary direct increase in ambient noise levels around the construction area. The actual increase in ambient noise levels would depend on the construction activity occurring, and the number and mix of construction vehicles and equipment in use. Construction activities are anticipated to occur during the day when residents are typically less sensitive to noise than they are at night.

Construction of a power plant can generally be divided into five phases that use different types of construction equipment. The five phases are grading and excavation, concrete pouring, steel erection, machinery installation, and site clean-up. In addition, construction of electric transmission facilities, the water supply system, a rail spur, and access roads would occur.

Estimated construction noise levels were calculated based on the equipment list contained in the Toquop Energy Project Final EIS (BLM, 2003). As proposed at the time, the Toquop Energy Project in Nevada is similar to the proposed White Pine Energy Station. The same general kinds and numbers of equipment would be used to construct the Station as the proposed Toquop Energy Project, and this approach provides a representative estimate of the range of expected noise levels during construction of the Station. Table 4.6-32 shows the calculated construction noise levels at Hot Springs Ranch, the nearest noise sensitive receptor, that would be associated with construction of various Station Proposed Action features.

TABLE 4.6-32

Calculated Proposed Action Construction and Operation Total Noise Levels at Hot Springs Ranch

Noise Source	Range of Sound Pressure Levels at 50 feet at Construction Site (dBA)	Total Noise Level at Ranch (dBA)
Construction		
Power plant approximately 3 miles from Hot Springs Ranch	71 (electrical generator) to 87 (D8 bulldozer)	51
Electric transmission facilities approximately 2 miles from Hot Springs Ranch	84 (pickup truck) to 87 (D8 bulldozer)	51
Water supply system approximately 1 mile from Hot Springs Ranch	84 (pickup truck) to 86 (trackhoe or D6 bulldozer)	53
Rail spur approximately 3 miles from Hot Springs Ranch	84 (pickup truck) 87 (D8 bulldozer)	48
Construction of power plant access road approximately 3 miles from Hot Springs Ranch	84 (pickup truck) to 87 (D8 bulldozer)	48
Operation [a]		
Substation transformer at 3 miles from the power plant	100[d]	18[b]
Forced draft fan at 3 miles from the power plant	123[d]	32
Coal tower at 3 miles from the power plant	132[d]	39[c]
Coal train at 3 miles from the power plant	67 [e]	42[b]
Total noise with coal delivery work at 3 miles from the power plant		44
Total noise without coal delivery work at 3 miles from the power plant		32

Source: Allouche, Cowan and Gilchrist, 2003 (bulldozers); Miller, 1988 (all other equipment); Harris, Miller & Hanson, 2006 (coal train)

[a] Background noise level is 45-50 dBA at the Proposed Action power plant and Alternative 1 power plant sites, and 40-45 dBA at the Thirtymile Substation site. The calculated noise levels are all below the background noise levels.

[b] Atmospheric absorption is ignored in the calculation. Therefore, the calculation is very conservative.

[c] This analysis is conservative in that it assumes coal handling equipment would be located outdoors, where in reality most noise sources associated with coal handling would be indoors.

[d] Sound power

[e] Sound pressure level (dBA), L_{eq} (1 hour), 50 miles per hour at 50 feet from track

During the construction phase, maximum total noise level is estimated to be 58 dBA at Hot Springs Ranch approximately 3 miles from the Proposed Action power plant site. However, during actual construction, construction noise levels at Hot Springs Ranch would be far below the estimated 58 dBA because of the following reasons:

- Overall construction noise level is estimated based on the maximum rated power of each piece of equipment, but in field operation, most equipment is not driven at full speed or power
- In estimating construction noise levels, it is assumed that all construction activities and equipment are fully operated at the same time, but in field operation, it is not likely that all

construction activities would occur simultaneously

- It is assumed that the construction of electric transmission facilities, the water supply system, a rail spur, and access roads occur at the locations closest to Hot Springs Ranch. In field operation, it is not likely that these construction activities would occur simultaneously at the nearest locations to Hot Springs Ranch
- Atmospheric absorption, which reduces noise levels, is not accounted for in the analysis

Steam Blowouts. Near the end of power plant construction, it would be necessary to generate steam in the boiler and release it to the atmosphere to clean the steam piping. This process is called "steam blowouts." This noise is broadband and only occurs for a few minutes during each blowout for the first few weeks of boiler operation. Approximately 30 to 50 total "blows" are required for a typical power plant before the boiler is operated. This work would likely occur during both daytime and nighttime to avoid the need to heat and cool the boiler during these cycles.

The "Overall Sound Power Level" for a typical steam blowout is 166 dBA (Beranek and Ver, 1992). After accounting for distance and atmospheric absorption for this specific activity, typical noise level for each boiler steam blowout would be 74 dBA at 3 miles from the power plant.

Operation

Outdoor equipment operation is the primary source of noise during power plant operation. Outdoor equipment that would generate the highest noise levels during Station operation is listed in Table 4.6-32 and assumed to include the following:

- One substation transformer in the Duck Creek Substation and one in the Thirtymile Substation. The maximum rating of the substation transformer is assumed to be 60 MVA. "Overall Sound Pressure Level" (dBA) for the substation transformer at 150 meters away is 48 dBA (Beranek and Ver, 1992).
- One forced draft fan.
- Coal tower.

Other significant noise sources during Station operation include coal crushers, the induced draft fan, and de-aerators, but these sources would be located indoors and have less impact than the outdoor forced draft fan. Although the fans associated with typical air cooled condensers are very loud, the proposed natural draft cooling towers are virtually silent.

The NNR is an existing railroad that runs from Cobre to Ely. This railroad is currently inactive from Cobre to a point near McGill. Once the Station power plant becomes operational, the coal trains would come near Shafter and pass through Currie on the way to the plant. Based on a site visit, there are no residences in Currie. Coal would be delivered to the power plant via the rehabilitated and upgraded NNR and the new rail spur to the power plant site. The coal train would be another noise source in addition to the outdoor equipment listed above. In this analysis, it is assumed that only one coal train would operate per hour.

Table 4.6-32 shows the calculated noise levels from the coal train and from project operation equipment and activities at 3 miles, the minimum distance from the nearest sensitive receptor (Hot Springs Ranch) to the Proposed Action power plant site. All of the calculated noise levels are below the existing noise levels of 45 to 50 dBA. Total estimated noise levels

3 miles from the power plant during Station operation without and with coal delivery work are 32 dBA and 44 dBA, respectively, and are below the background noise level of 45 to 50 dBA (see Table 4.6-32).

4.6.2.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.6.2.2 Alternative 1

4.6.2.2.1 Impacts

Construction noise levels at the nearest noise sensitive areas associated with the Alternative 1 power plant would be less than those described for the Proposed Action. This is because the Alternative 1 power plant would be farther from noise sensitive areas than the Proposed Action power plant. Plant operation noise levels also would be less than those described for the Proposed Action because of greater distances to the nearest noise sensitive areas.

Under Alternative 1, coal trains would pass within approximately 0.5 mile of Hot Springs Ranch. At this distance, the calculated train noise level at Hot Springs Ranch is 50 dBA L_{eq} (1 hour), which is near the existing noise levels of 45-50 dBA.

4.6.2.2.2 Mitigation

No mitigation is required for Alternative 1.

4.6.2.3 Connected Actions

4.6.2.3.1 SWIP

The SWIP Final EIS did not specifically address noise. It is expected that noise associated with the construction of the SWIP transmission facilities would generally be similar to that calculated for the White Pine Energy Station. The calculated noise level two miles away from the construction site of Station transmission facilities would be approximately 51 dBA, which is near the range of background noise levels of 45 to 50 dBA in the Station project area.

4.6.2.3.2 NNR

There would be temporary noise impacts associated with NNR construction activities, while noise from passing trains would be intermittent, short-term, and limited. David Evans and Associates, Inc. (2003) reported that these impacts would not be significant because there are few sensitive receptors nearby, none are immediately adjacent to the NNR, and there are no substantial concentrations of sensitive land uses in the area (David Evans and Associates, Inc., 2002). As discussed previously for the White Pine Energy Station, the calculated noise levels at Hot Springs Ranch from a train passing within 0.5 mile and within 3 miles of the ranch are 50 and 42 dBA L_{eq} (1 hour), respectively. These values are less than or within the range of existing background noise levels of 45-50 dBA. Once restored, up to 4 trains per day or approximately 30 trains per week may use the NNR. About 12 of these trains would be conveying coal to the Station power plant each week.

4.6.2.4 No Action Alternative

No Station-related noise impacts would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.7 Visual Resources

This section provides a general description of Station facilities that would have an impact on visual resources and references BMPs that would be followed to reduce visual impacts. This section discusses the seen area analysis that was conducted for the Station Proposed Action and Alternative 1 facility components, and describes the impacts of the Proposed Action and Alternative 1 sites on the six KOPs. This section also discusses impacts of the Station Proposed Action and Alternative 1 on visual resources and VRM consistency and the potential impacts of Station light on night skies. Visual resource impacts that would be associated with the two connected actions (SWIP and NNR Upgrade and Operation) and with the No Action Alternative are described. Cumulative impacts are discussed in Section 4.19, *Cumulative Impacts.*

4.7.1 Description of Facilities

Power generating plants are large-scale features in a landscape. Table 4.7-1 describes some of the larger Station facilities associated with power generation that would be most visible to the general public. These facilities would be present at both the Station Proposed Action and Alternative 1 sites, but the layouts of each site would differ. Chapter 2, *Description of Proposed Action and Alternatives*, provides detailed descriptions of the facilities and layouts.

TABLE 4.7-1

Visible Facilities Associated with the White Pine Energy Station Power Plant Site

Facility	Notes
Cooling towers	The towers (up to three, approximately 550 feet tall) would be the Station's most visible facilities. Color would be concrete gray, which would darken over time. Texture would be smooth. The natural draft dry towers would not have steam plumes or fog associated with them. Night lighting required by the Federal Aviation Administration (FAA) (on all structures over 200-feet above the level of the adjacent ground) would be visible at night to varying degrees.*
Steam generator stacks	The two approximately 600-feet high stacks would be second most visible Station facilities. Would be a gray concrete color that would darken over time. Night lighting required by the FAA would be visible to varying degrees during the night.
Power plant block	Power blocks that house the steam generator/boiler structures would be very visible.
Coal storage, unloading, treating, and handling facilities	The storage pile area would take up to 45 acres. The unloading, treating, conveying, and handling facilities would be visible as large structures.
Solid waste disposal facility for ash and berms	Ash berms would be up to 100 feet high and take up to 200 acres.
Evaporation pond and berms	Pond would be 75 acres in area and with berms and setbacks would total 90 acres.
Fuel oil storage tanks	Seen as large structures.
Duck Creek Substation	Would be most visible as Station facility that is connected to the transmission lines.
Railroad siding and project siding roads	Would be somewhat visible on ground plane.

*Source: U.S. Department of Transportation, 2000.

In addition to the facilities associated with the power plant, other types of facilities would have potential effects on the existing visual conditions. The facility that would be most visible would be the 500-kV line that would run from the proposed Duck Creek Substation at either power plant site to the proposed Thirtymile Substation. Under the Proposed Action, there would be approximately 34 miles of transmission line and cleared ROW. Under Alternative 1 there would be approximately 28 miles of transmission line. Spans between tower structures are expected to be between 600 and 1,500 feet. The most visible component of the transmission line would be the tower structures, which would range from 90 to 160 feet high. ROWs with large vegetation removed also would be visible in places. ROWs would be 500 feet wide in most locations (to eventually accommodate up to three transmission lines).

The development of the water supply system would also potentially have some effects on existing visual conditions. The system would consist of eight wells and a 12-mile-long underground pipeline system under the Proposed Action and an 8-mile-long underground pipeline system under Alternative 1. Some wells would have approximately 12-foot-wide access roads built for them, some would be associated with water storage tanks, others might contain pumping stations, and some would require new electrical distribution lines. All of the wells would be surrounded by chain link fencing. Construction of the pipeline would be expected to disturb a 60-foot-wide area. The pipeline would have a 30-foot-wide cleared ROW.

To help reduce potential visual impacts of the power plant and other Station facilities and to preserve the landscape near these facilities to the extent possible, a number of BMPs have been developed as an integral part of Station construction and operation. The BMPs for visual resources are described in Appendix A, *Best Management Practices.*

4.7.2 Proposed Action

4.7.2.1 Site description

The Proposed Action power plant site would encompass approximately 1,281 acres and contain the cooling towers, steam generator stacks, and other power plant facilities highlighted previously. The site would be approximately 34 miles north of Ely, 22 miles north of McGill, and 12 miles south of the community of Cherry Creek. Distances between the site and the six KOPs are discussed in Section 4.7.2.3, *Impacts on KOPs and Consistency with VRM Classes.* To determine how visible facilities associated with the Proposed Action site would be, a seen area analysis was conducted and is discussed in the following text.

The Proposed Action facilities would be located on the line that separates a VRM Class II area from a VRM Class III area in the Draft Resource Management Plan. As described in Section 3.7.3, *BLM Visual Resource Management (VRM) System*, the exact location of lines that divide VRM classes in the Draft Resource Management Plan did not take site-specific characteristics into consideration. The intent of the Draft Resource Management Plan was that specific VRM class locations would be determined when reviewing specific projects. For this EIS, the Ely District decided that the VRM class for the lands near the Proposed Action site would be more appropriate as Class III. New lines demarcating the Class III and Class II areas near the Proposed Action site will be updated in the future. The impact assessment for the Proposed Action site assumes that it is located in a VRM Class III area.

4.7.2.2 Seen Area Analysis

A seen area analysis can be used to help determine the likelihood that an object can be viewed in the landscape. It identifies all areas that can potentially be seen from a single point via a straight line. A seen area analysis does not take into account factors that can influence visibility such as atmospheric conditions, light intensity, and vegetation. This analysis is useful for determining and assessing maximum viewed areas, and as such can be considered a worst-case analysis.

4.7.2.2.1 Cooling Tower and Steam Generator Stack Height Seen Area Analysis

The proposed cooling towers would be approximately 600 feet high. The actual height for the cooling towers and steam generator stacks could change to some degree. Therefore, a seen area analysis for four different heights was conducted. The heights were 200, 300, 400, and 700 (for a worst-case scenario) feet As depicted in Figure 4.7-1, the seen area for the top of a 700-foot structure (which as stated previously would be approximately 100 feet higher than the likely 600-foot high cooling tower and generator stacks) would range from north of Goshute Lake, south through Steptoe Valley to near Ely. The seen area for a 700-foot structure would also include the slopes of the Schell Creek Range to the east and the Egan and Cherry Creek Ranges to the west. Figure 4.7-1 also displays the seen area for each successively lower facility height. Because of the flat nature of Steptoe Valley, all of the lower facility heights would potentially be seen through much of Steptoe Valley and from the slopes of some adjacent mountains.

4.7.2.2.2 Power Plant Height Seen Area Analysis

Although the height and bulk of the various facilities associated with the power plant would vary, a height of 300 feet was assumed for the seen area analysis. The 300-foot height is the approximate height of the power blocks that would house the steam generator/boiler structures. The same seen area analysis that is depicted in Figure 4.7-1 for a 300-foot-tall facility was used to represent the seen area of a hypothetical 300-foot-tall power block. The seen area of the power block would include most of Steptoe Valley north to approximately Greens Siding.

The power block also could potentially be seen along slopes immediately adjacent to the valley. Ely and most of McGill would not be in the power block seen area, but part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness would be. The color scenario that is proposed for the power plant facilities would help reduce the visual impact of the facilities.

4.7.2.2.3 Transmission Line Structure Height Seen Area Analysis

Transmission line structures could vary from 90 to 160 feet in height. The span between the structures would be expected to range between 600 and 1,500 feet. For the seen area analysis, a 140-foot-high structure with 800-foot spacing was modeled. Figure 4.7-2 displays the potential seen area of the transmission towers associated with the Proposed Action. This information is further broken down based on ranges of the numbers of transmission structures potentially seen. The potential impact would increase with the number of structures that could potentially be seen. The portion of the transmission line route that would be most visible to the greatest number of people is the section that leaves the Duck Creek Substation at the power plant site and runs along the upper (western) edge of Steptoe Valley, and then up the eastern slope of the Egan Range. Once over the Egan Range, the transmission line would be very visible from Hunter Flat and parts of Butte Valley, but would be seen by few people.

4.7.2.3 Impacts on KOPs and Consistency with VRM Classes

Appendix E, *Visual Inventory Forms,* contains Visual Resource Inventory Forms that were completed based on field examinations of the visual settings of each KOP. The forms describe the existing conditions of the characteristic landscape seen from each KOP, types of viewers, sensitivity of viewers, and other relevant information.

The following text describes impacts of the Station Proposed Action on each of the six KOPs. Impacts on each KOP were analyzed by reviewing the Visual Contrast Rating Worksheets that were developed for each KOP (see Appendix E, *Visual Inventory Forms*), seen area maps, facility descriptions, and simulations. Visual simulations were developed for the two KOPs (KOP 2: Pony Express Route and KOP 3: Lincoln Highway) that would be located closest to the Proposed Action power plant site).

4.7.2.3.1 KOP 1: Cherry Creek

KOP 1 is approximately 12-miles northwest of the Proposed Action power plant site in the background distance zone. It would be within the seen area for all potential cooling tower and steam generator stack heights as depicted in Figure 4.7-1.

Because of the distance from this KOP to the Proposed Action power plant, site facilities would be relatively small components of the viewed landscape and the Proposed Action would meet VRM Class III objectives.

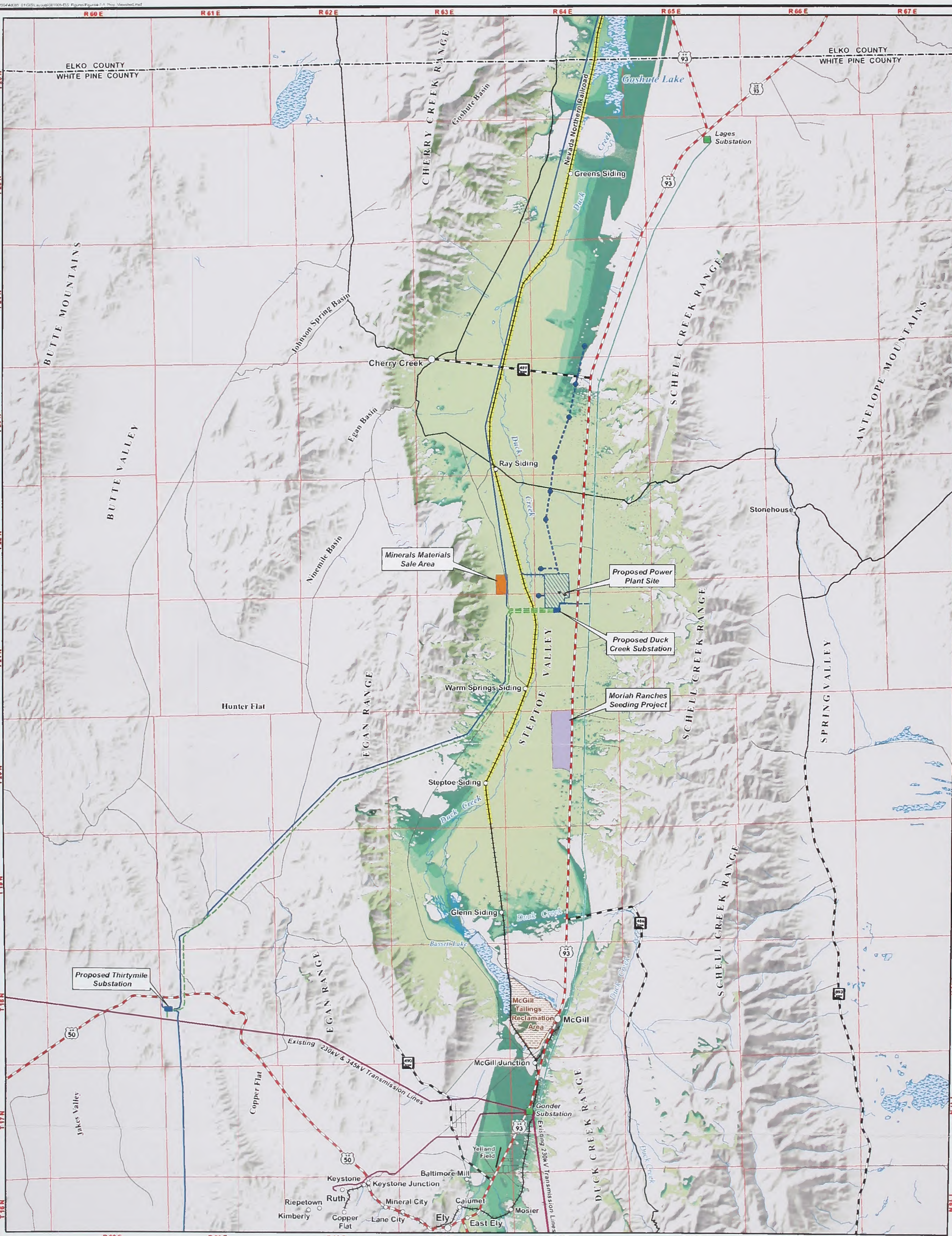
Views of most of the transmission line would be blocked by topography and the part that would be seen would meet VRM Class III objectives. The portions of the upgraded railroad and water pipeline ROW seen from this location would pass through VRM Class II lands and would meet VRM Class II objectives.

4.7.2.3.2 KOP 2: Pony Express Route

The Proposed Action power plant site is approximately 4.5 miles south of KOP 2 in the foreground-middleground distance zone. KOP 2 would be in the seen area of all cooling tower heights (see Figure 4.7-1). The concave cylindrical shape of the cooling towers and the cylindrical shape of the stacks would be seen in the distance silhouetted against the sky and mountains from this location as depicted in the simulation seen as Photo (Simulation) 4.7-1. FAA-required lights on the cooling towers and stacks would be clearly seen at night from KOP 2. Other power plant site facilities such as the power block, berms for the evaporation pond, solid waste disposal areas, and piles of stored coal would be seen from this KOP as long horizontal forms in the landscape. The waters of the evaporation pond would not be seen because of view blockage by the berms.

Changes to the characteristic landscape seen from this location would be moderate to high. The Proposed Action power plant site would meet VRM Class III objectives.

The segment of the transmission line that directly feeds into the Proposed Action power plant site would be visible (11 to 25 structures) from KOP 2 (see Figure 4.7-2). The closest part of the transmission line would be approximately 6 miles south of KOP 2 and would be in an area of VRM Class III. The transmission line would meet VRM Class III objectives.



Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Seen Area Analysis
- Modeled Stack Height Visible-200 feet
- Modeled Stack Height Visible-300 feet
- Modeled Stack Height Visible-400 feet
- Modeled Stack Height Visible-700 feet

Project Area
NEVADA

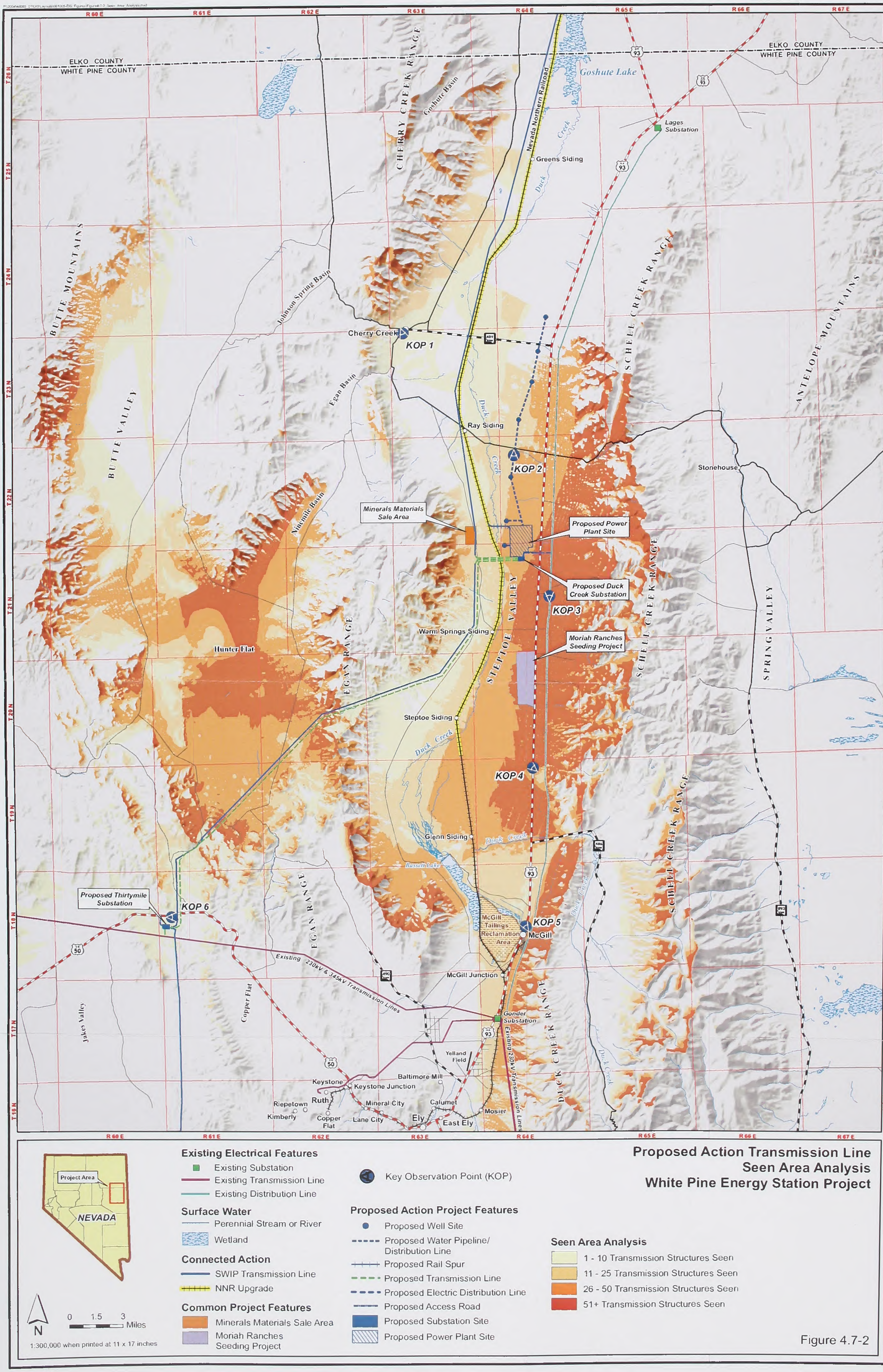
N

0 1.5 3 Miles

1:300,000 when printed at 11 x 17 inches

Proposed Action Stack & Power Block Seen Area Analysis White Pine Energy Station Project

Figure 4.7-1



Proposed Action Transmission Line
Seen Area Analysis
White Pine Energy Station Project

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Key Observation Point (KOP)

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Seen Area Analysis
- 1 - 10 Transmission Structures Seen
- 11 - 25 Transmission Structures Seen
- 26 - 50 Transmission Structures Seen
- 51+ Transmission Structures Seen

Project Area
NEVADA

0 1.5 3 Miles

1:300,000 when printed at 11 x 17 inches

Figure 4.7-2

The upgraded rail line and water pipeline ROW as well as the electrical distribution line (primarily the 55-foot high poles) for well pumps would be visible from KOP 2. Parts of the rail line and the occasional train (approximately 12 trains a week) would likely be seen approximately 2.5 miles to the west in an area of VRM Class II. The improved rail line would meet the VRM Class II objectives when viewed from this location.

The 30-foot wide ROW for the waterline would be seen from this KOP. After construction the cleared ROW would revegetate over time. An unpaved access road and 55-foot-high poles with an electrical distribution line would be located within the ROW. VRM Class II objectives should be met when looking at the ROW from near this location.

4.7.2.3.3 KOP 3: Lincoln Highway

This KOP is located along the Lincoln Highway approximately 2.5 miles south of the Proposed Action power plant site. The three cooling towers and two steam generator stacks would be very visible from this location as depicted in the simulation displayed in Photo (Simulation) 4.7-2. The three concrete colored cooling towers and steam generator stacks would contrast enough with the characteristic landscape that they would cause a moderate change to the landscape, which would not meet VRM Class III objectives. A number of other facilities within the power plant site would also be visible as depicted in the visual simulation that was done to represent the view of the site from KOP 3 (see Photo [Simulation] 4.7-2). Although the other facilities would be visible, they would not be visually dominant. These facilities would be visible and would contrast with the adjacent landscape in form, shape, and scale. A range of colors similar to those in the nearby landscape is proposed to be used for some of the facilities as illustrated in Photo (Simulation) 4.7-2 Painting the facilities these colors would help reduce the visual impacts of the facilities, but VRM Class III objectives still would not be met.

The segment of the transmission line that directly feeds into the Proposed Action power plant site would be visible from KOP 3 and would meet VRM Class III objectives. The upgraded railroad and water pipeline ROW would likely not be visible from this location and if seen would meet VRM Class III objectives.

4.7.2.3.4 KOP 4: U.S. 93 Turnoff

This KOP is approximately 12 miles south of the Proposed Action power plant site in the background distance zone. The tops of the three cooling towers and stacks would be visible in the distance from this KOP but would be far enough away to meet VRM Class III objectives. The closest segment of the transmission line and water pipeline would meet VRM Class III objectives. The upgraded railroad line would not be seen.

4.7.2.3.5 KOP 5: McGill

KOP 5 would be approximately 21 miles south of the Proposed Action power plant site. The Proposed Action power plant site would meet VRM Class III objectives as would the transmission line, water pipeline, and upgraded railroad.

4.7.2.3.6 KOP 6: U.S. 50

The only Station facility that would be visible from this KOP along U.S. 50 would be the transmission line, which would be approximately 0.25-mile west of the KOP and the entrance road to the Thirtymile Substation (and possibly signs and vehicles). The transmission line would meet objectives of VRM Class III.

4.7.2.4 VRM Consistency

Facilities associated with the Station Proposed Action would be viewed to varying degrees throughout much of Steptoe Valley and from adjacent slopes. Station facilities (or parts of

Station facilities) could potentially be viewed throughout the valley. The BMPs contained in Appendix A, *Best Management Practices*, for Visual Resources as well as Landscape Preservation and Impact Avoidance, would help to reduce the visual impacts of some facilities (other than the cooling towers and generator stacks) throughout much of the seen area and have been considered in this assessment of whether or not VRM class objectives would be met. VRM class objectives would be met for the Proposed Action when viewed from most of the KOPs. As depicted in Table 4.7-2, the Proposed Action would meet VRM objectives at four of the six KOPs and would not meet VRM Class III objectives at the two KOPs located closest to the Proposed Action.

TABLE 4.7-2

Summary of White Pine Energy Station Proposed Action and Alternative 1 VRM Class Objective Consistency

Facility	VRM Class(es)	VRM Class Objective Met: KOP 1: Cherry Creek	KOP 2: Pony Express Route	KOP 3: Lincoln Highway	KOP 4: U.S. 93 Turnoff	KOP 5: McGill	KOP 6: U.S. 50
Proposed Action							
Cooling towers and stacks	III	Yes	Yes	No	Yes	Yes	Not seen
Power plant	III	Yes	Yes	No	Yes	Yes	Not seen
Evaporation pond	III	Yes	Yes	Yes	Yes	Yes	Not seen
Solid waste storage	III	Yes	Yes	Yes	Yes	Yes	Not seen
Transmission line	III	Yes	Yes	Yes	Yes	Yes	Yes
Railroad track	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not Seen	Not seen	Not seen
Water pipeline cleared ROW	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not seen	Not seen
Alternative 1							
Facility	*VRM Class(es)*	*VRM Class Objective Met*					
Cooling towers and stacks	III	Not seen	Yes	Yes	No	Yes	Not seen
Power plant	III	Not seen	Yes	Yes	No	Yes	Not seen
Evaporation pond	III	Not seen	Not seen	Yes	Yes	Yes	Not seen
Solid waste storage	III	Not seen	Not seen	Yes	Yes	Yes	Not seen
Transmission line	III	Not seen	Yes	Yes	Yes	Yes	Yes
Railroad track	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not seen	Not seen
Water Pipeline cleared ROW	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not seen	Not seen

PHOTO 4.7-1
Simulation of View of Proposed Action from KOP 2. Representative of simulation of view from KOP 1.

PHOTO 4.7-2
Simulation of View of Proposed Action from KOP 3

In summary, the Station Proposed Action sites would meet VRM Class III objectives when viewed from most of Steptoe Valley. VRM Class III objectives would not be met when viewed within several miles of the Proposed Action power plant site because of the scale of cooling towers, generator stacks, and to a lesser degree, the power plant.

4.7.2.5 Night Sky Effects

In addition to the potential impacts of the proposed Station facilities themselves, lights associated with the Station facilities could have potential impacts on the visual environment (although not measurable in the VRM system). As mentioned in Section 3.7.2, *Existing Conditions*, the issue of dark skies is receiving attention nationally, particularly in relationship to potential effects of light on dark skies associated with National Parks. The NPS provided suggestions on ways to help minimize light impacts on dark skies from development projects (Moore, 2005). These suggestions are important parts of the Station visual resources BMPs contained in Appendix A, *Best Management Practices*. They include using directional lights that do not allow lights to shine into the sky, screening lights, using timers and motion detectors so that lights are only on when necessary, and designing a lighting system than minimizes lighting to only meet functional requirements. Even with implementing the BMPs, some lights associated with the Proposed Action would be visible from parts of Steptoe Valley. The new lights would likely add somewhat to the "island" or "dome" of light that is produced by the towns of Ely and McGill. The addition of some night light from the Proposed Action Station may possibly be seen as slightly isolated from the "dome" of light from Ely and McGill because the Proposed Action power plant site is approximately 34 miles and 22 miles, respectively, north of these two communities. However, by following the BMPs in Appendix A that were established to minimize the effect of night light associated with the Station, it is not believed that the Proposed Action would add appreciably to the glow from Ely and McGill that can be seen from Great Basin National Park.

4.7.2.6 Mitigation

No mitigation is required for the Proposed Action.

4.7.3 Alternative 1

4.7.3.1 Site Description

The Alternative 1 power plant site would be approximately 22 miles north of Ely, 10 miles north of McGill, and 22 miles south of Cherry Creek. The site would cover approximately 1,330 acres and contain the same facilities as the Proposed Action power plant site. However, the layout of the facilities would be different as described in Chapter 2, *Description of Proposed Action and Alternatives*. The Alternative 1 power plant site is in an area that has a VRM Class of III. Most of the transmission line would pass through VRM Class III lands. The upgraded railroad and the water pipeline would pass through BLM lands that are VRM Class II and III.

4.7.3.2 Seen Area Analysis

A seen area analysis for Alternative 1 facilities was developed to help analyze visual impacts. Figure 4.7-3 depicts the seen areas associated with Alternative 1 cooling tower heights and the power block, and Figure 4.7-4 illustrates the seen areas of the Alternative 1 transmission line.

4.7.3.2.1 Cooling Tower and Steam Generator Stack Height Seen Area Analysis

As with the Proposed Action, seen area maps for cooling tower and structure heights of 200, 300, 400, and 700 feet (the potential "worse-case" height) were developed, even though the cooling tower and generator stack heights would be approximately 600 feet. The seen area of the 700-foot height would range from parts of the west shore of Goshute Lake in the north to areas near Ely in the south. The 700-foot-height seen area under Alternative 1 would be less visible at the northern parts of Steptoe Valley than for the Proposed Action. The stack would be more visible at the southern portion of the valley. The seen area for each successively lower height would be somewhat reduced as depicted in Figure 4.7-3. However, even the 200-foot height would potentially be seen through much of the middle and southern parts of Steptoe Valley.

4.7.3.2.2 Power Plant Height Seen Area Analysis

The height of the power block of the power plant was assumed to be 300 feet for the seen area analysis. As shown in Figure 4.7-3, the seen area of a 300-foot-tall power block would extend north to Ray Siding (and the lower eastern slopes of the Cherry Creek Range) and south to areas east of Ely. The power block would also potentially be seen along slopes immediately adjacent to Steptoe Valley. Parts of Ely and McGill would be in the power block seen area, but Cherry Creek would not. As stated previously, the colors that are proposed for power plant facilities would help reduce the visual impact of the facilities when viewed from a distance. FAA-required lights on the stacks would likely be seen at night throughout the seen area of the cooling towers.

4.7.3.2.3 Transmission Line Structure Height Seen Area Analysis

The transmission line information discussed under the Proposed Action is applicable to Alternative 1. Figure 4.7-4 displays the potential seen area of the transmission towers associated with Alternative 1. The transmission line route associated with Alternative 1 would cross the width of Steptoe Valley. As a result, more structures associated with the transmission line route of Alternative 1 would potentially be seen by more people than with the Proposed Action. After reaching the base of the Egan Range, the routes would be the same.

4.7.3.3 Impacts on KOPs and Consistency with VRM Classes

The following text describes impacts of Alternative 1 on each of the six KOPs. As was the case with the Proposed Action, the analysis was conducted by reviewing the Visual Contrast Rating Worksheets that were developed for each KOP (Appendix E, *Visual Inventory Forms*), seen area maps, facility descriptions, and simulations.

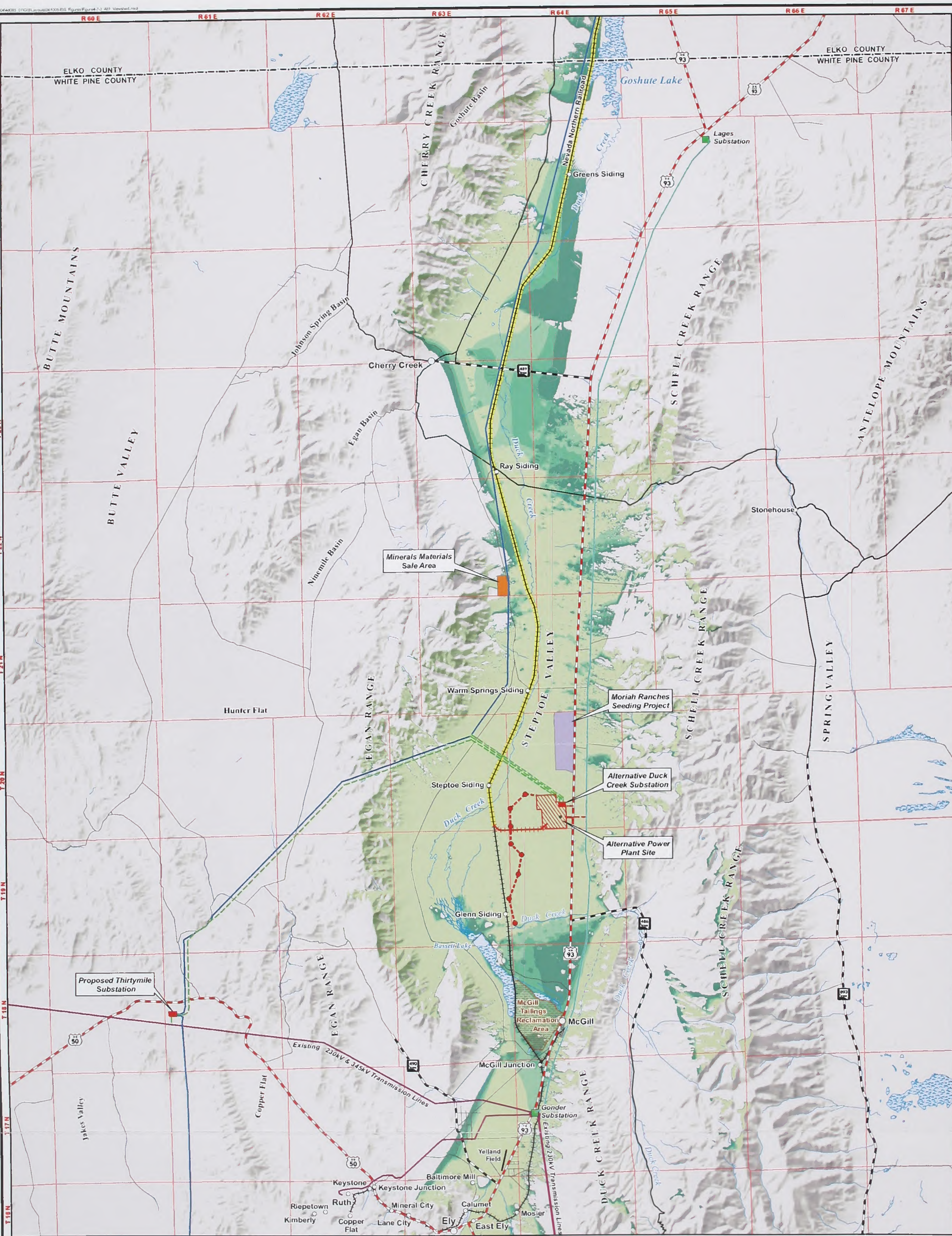
4.7.3.3.1 KOP 1: Cherry Creek

The Alternative 1 power plant site and transmission line would not be seen from the community of Cherry Creek. Parts of the upgraded rail line and water pipeline ROW would be potentially seen and would meet VRM Class II objectives.

4.7.3.3.2 KOP 2: Pony Express Trail

The Alternative 1 power plant site would be approximately 16 miles south of this KOP and would meet VRM Class III objectives.

KOP 2 is not in the seen area of any segments of the transmission line associated with Alternative 1.



Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Seen Area Analysis
- Modeled Stack Height Visible-200 feet
- Modeled Stack Height Visible-300 feet
- Modeled Stack Height Visible-400 feet
- Modeled Stack Height Visible-700 feet

Project Area

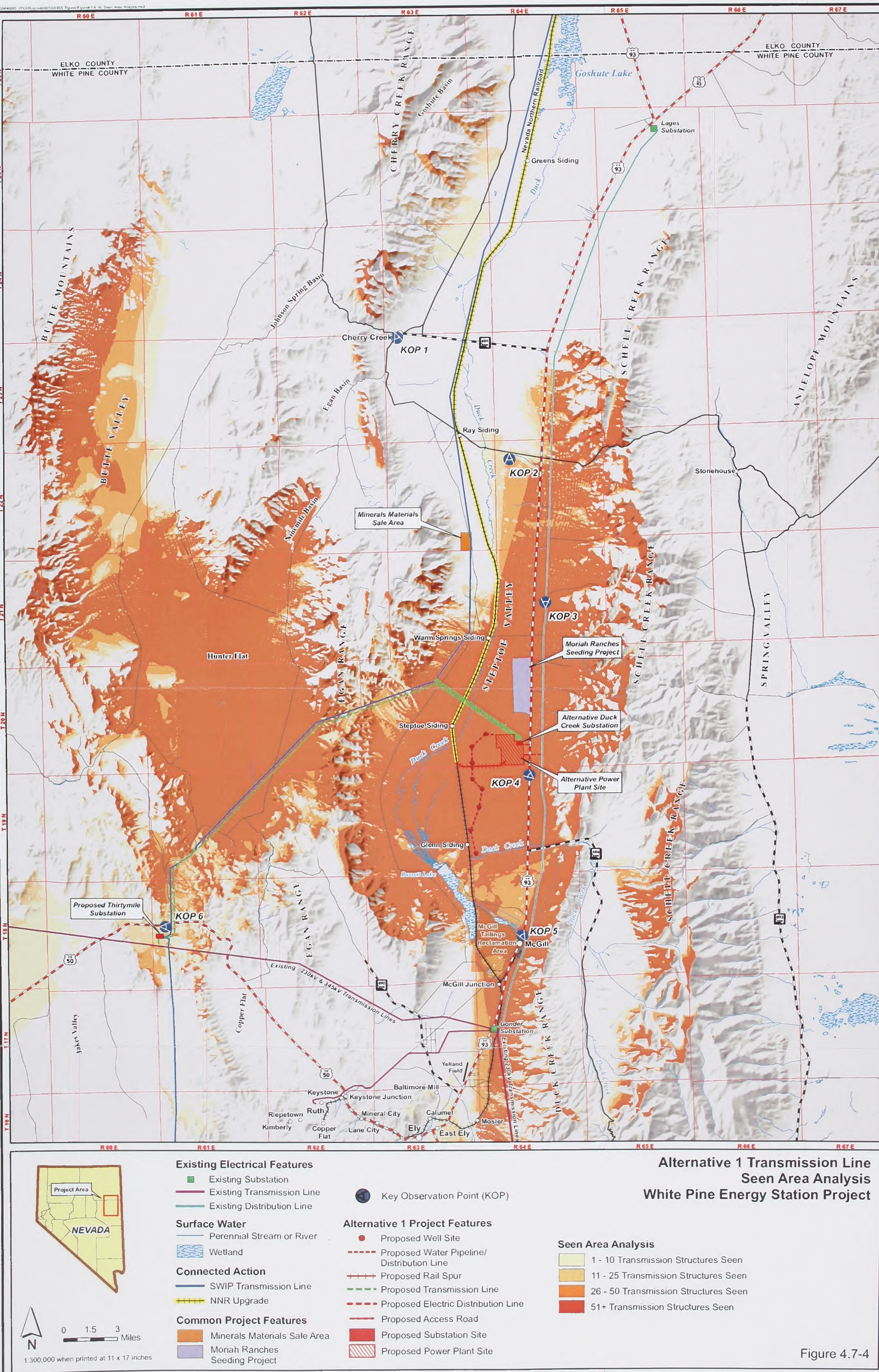
NEVADA

0 1.5 3 Miles

1:0,000 when printed at 11 x 17 inches

Alternative 1 Stack & Power Block Seen Area Analysis
White Pine Energy Station Project

Figure 4.7-3



Alternative 1 Transmission Line Seen Area Analysis
White Pine Energy Station Project

Figure 4.7-4

Impacts of the upgraded railroad and the water pipeline associated with Alternative 1 would be the same as those discussed for the Proposed Action.

4.7.3.3.3 KOP 3: Lincoln Highway

This KOP is located along the Lincoln Highway approximately 7 miles north of the Alternative 1 power plant site. KOP 3 would be within the seen area of all cooling tower heights and the power block (see Photo 4.7-2 [Simulation]). FAA-required lights on the cooling towers would be seen from this location at night, as would some exterior lighting. Alternative 1 would meet VRM Class III objectives. KOP 3 would be within the seen area of the Alternative 1 transmission line (see Figure 4.7-3) and would meet VRM Class III objectives. Impacts from the upgraded railroad and water pipeline associated with Alternative 1 would be the same as those discussed for the Proposed Action.

4.7.3.3.4 KOP 4: U.S. 93 Turnoff

This KOP is approximately 1 mile southeast of the Alternative 1 power plant site in the foreground-middleground distance zone. A number of project facilities would be visible from this vantage point as illustrated in Photo (Simulation) 4.7-3, which is a visual simulation of the Alternative 1 site as seen from KOP 4. The cooling towers (600 feet high in the simulation) and the stacks would be the facilities most visible to people driving north on U.S. 93. Both the cooling towers and the stacks would be the color of concrete and would be silhouetted against the sky. The coal storage area would be visible and would appear as a long, dark horizontal form in the landscape. Other visible large facilities such as the power block, coal conveyers, water filters, and storage tanks would be less visible than the stacks and the coal storage area because they would be painted different colors (see Section 4.7.1, *Description of Facilities*). Painting the facilities different appropriate colors found in the nearby landscape would help reduce the color contrast and visual impacts of the facilities most of the year. When snow is present on the ground and in the mountains in the background, the painted facilities would contrast with the white environment. The site would be within the foreground-middleground distance zone in an area of VRM Class III. From the vantage point of KOP 4, the changes to the characteristic landscape from the project would not meet VRM Class III objectives.

The transmission line would be seen as it would leave the Alternative 1 Duck Creek Substation at the power plant site and as it would progress southwest along the base of the Egan Range. The transmission line would meet the VRM objectives of the VRM Class III area it would pass through. The railroad line would be as close as 1 mile away from this KOP and would also meet VRM Class III objectives. The water pipeline ROW might be seen. Even if seen, it would meet VRM Class III objectives.

4.7.3.3.5 KOP 5: McGill

KOP 5 is approximately 10 miles south of the Alternative 1 power plant site, which would meet VRM Class III objectives (see Photo [Simulation] 4.7-4). The transmission lines, railroad, and water pipeline ROW would not be seen from this location.

4.7.3.3.6 KOP 6: U.S. 50

The impacts for KOP 6 that were described under the Proposed Action would be the same under Alternative 1.

4.7.3.4 VRM Consistency

Facilities associated with Station Alternative 1 would be viewed to varying degrees throughout much of Steptoe Valley and from adjacent slopes. Station facilities (or parts of Station facilities) could potentially be viewed throughout the valley. As described for the Proposed Action, the BMPs contained in Appendix A, *Best Management Practices*, for Visual Resources as well as Landscape Preservation and Impact Avoidance, would help to reduce the visual impacts of some facilities (other than the cooling towers and generator stacks) throughout much of the seen area and have been considered in this assessment of whether or not VRM class objectives would be met. VRM class objectives would be met for Alternative 1 when viewed from most of the KOPs. As depicted in Table 4.7-2, Alternative I would meet VRM objectives at five of the six KOPs and would not meet VRM Class III objectives at one KOP (which is the closest KOP to the Alternative 1 power plant site).

In summary, the Station Alternative 1 sites would meet VRM Class III objectives when viewed from most of Steptoe Valley. VRM Class III objectives would not be met when viewed within several miles of the power plant site because of the scale of cooling towers, generator stacks, and to a lesser degree, the power plant.

4.7.3.5 Night Sky Effects

The same kinds of potential effects of Station light on night skies and BMPs that would be implemented to reduce these effects would occur under Alternative 1 as were described for the Proposed Action. However, the addition of some night light under Alternative 1 may appear to blend more into the "dome" of light from Ely and McGill because the Alternative 1 power plant site is approximately 12 miles closer to these communities than the Proposed Action power plant site. By following the BMPs in Appendix A that were established to minimize the effect of night light associated with the Station, it is not believed that Alternative 1 would add appreciably to the glow from Ely and McGill that can be seen from Great Basin National Park.

4.7.3.6 Mitigation

No mitigation is required for Alternative 1.

4.7.4 Connected Actions

4.7.4.1 SWIP

The presence of SWIP transmission towers and lines would result in varying levels of visual contrasts with the existing, background scenery and visual impacts to the area being viewed. Areas of potentially high visual impacts due to views of the SWIP corridor are from rural residences and agricultural areas in southern Idaho (for example, near Hagerman) and from isolated rural residences in Nevada (BLM, 1993).

Potentially high visual impacts to views along travel routes in Nevada would occur where the SWIP corridor crosses or parallels portions of U.S. Highway 93 (a designated scenic highway south from Majors Place); the California Trail Backcountry Byway; and the Kane Spring Backcountry Byway. High impacts also would occur where the SWIP corridor crosses roads in visually sensitive areas that provide primary access to Goshute Canyon WSA (now Wilderness) and Arrow Canyon WSA (BLM, 1993). There would be high visual impacts to recreation and tourist views from the Minidoka Relocation Center interpretive site in Idaho and from the Kane Springs Backcountry Byway in Nevada (BLM, 1993).

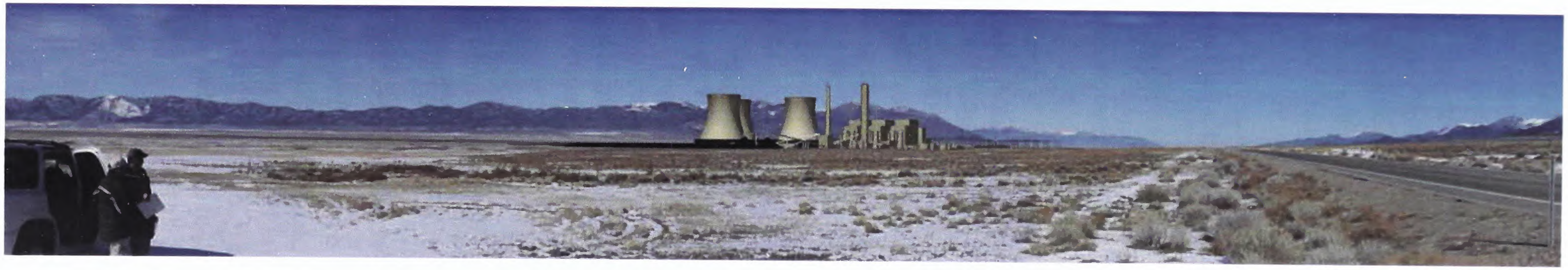


PHOTO 4.7-3
Simulation of View of Alternative 1 from KOP 4

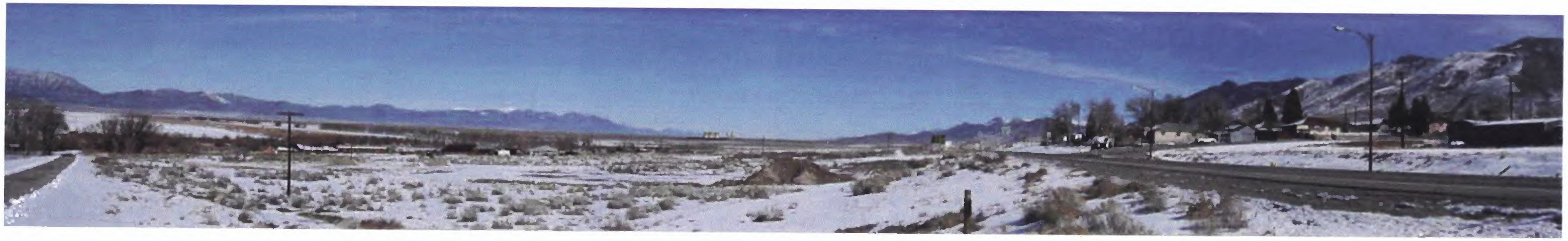


PHOTO 4.7-4
Simulation of View of Alternative 1 from KOP 5

Visual contrasts in the area of Salmon Falls Canyon and Rock Creek in southern Idaho and northern Nevada would not comply with VRM Class I designations in Nevada or VRM Class II designations in Idaho. Strong and moderate visual contrasts in areas that would not comply with VRM Class II designations in Nevada include crossings of Interstate 80 in northern Nevada and Pahranagat Wash in southern Nevada (BLM, 1993).

4.7.4.2 NNR

Restoration, operation, and maintenance of the NNR would retain the visual quality of the railroad track and surrounding landscape, would not obstruct public views, and would not adversely affect existing visual conditions (David Evans and Associates, Inc., 2002). In addition to upgrading the existing NNR, a rail loop would be built from the main line to the power plant that would be approximately 2 miles long for the Proposed Action and 3 miles long for Alternative 1. Construction of the loops would not adversely affect existing visual conditions. Approximately 12 trains of coal per week would be expected to use the upgraded NNR, which would introduce a visual element to the landscape that has not been seen in a number of years. The presence of the trains moving across the landscape would not adversely affect existing visual conditions.

4.7.5 No Action Alternative

No project-related impacts on visual resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.8 Recreation Resources

This section describes the potential effects of the proposed White Pine Energy Station on recreation resources within the project area. It also discusses the relevant recreation plans and policies that may be impacted.

The Station would be considered to have an adverse impact to recreation resources if any of the following apply:

- Directly disturb federal, state, local, or private recreation sites
- Restrict access to federal, state, local, or private recreation sites or restrict access to public land
- Substantially reduce the scenic values of undeveloped federal, state, local, or private recreation sites or Wilderness (BLM, 2001a)

4.8.1 Proposed Action

4.8.1.1 Impacts

4.8.1.1.1 Impacts to Recreational Opportunities on Federal, State, and County Lands.

The power plant site for the Proposed Action encompasses approximately 1,281 acres. This land has been identified for disposal by the BLM and upon sale would be removed from BLM permanent holding. Transferring ownership of the 1,281-acre parcel from public to private would preclude the continuation of existing recreational opportunities on the fenced site, which may include hiking, scenic viewing, camping, and all-terrain vehicle use. However, this effect would not be substantive because recreation in this area is dispersed and limited in nature on this site. These opportunities would still be available on lands adjacent to the parcel.

While a few developed recreation sites exist within the Station project area, the majority of recreational opportunities are dispersed and casual in nature. The closest developed recreation site to the Station site is the Goshute Cave Recreation Area, located near the Goshute Canyon Wilderness, approximately 24 miles from the location of the Proposed Action power plant. The Egan Crest Trailhead, located along U.S. 50, is approximately 15 miles from the proposed Thirtymile Substation. The closest State of Nevada managed recreation area is Comins Lake, approximately 10 miles southeast of Ely on U.S. 50. Numerous White Pine County recreation facilities exist within the Station analysis area, including a golf course, neighborhood parks, town parks, a swimming hole, and a shooting range. None of these facilities are anticipated to be directly impacted by the Station Proposed Action.

The Station's two steam generator stacks and three sets of cooling towers would be the Station facilities most visible to the general public. Final heights of the proposed stacks and cooling towers have not been determined, but they are expected to range between approximately 500 and 600 feet. Night lighting required by the Federal Aviation Administration (FAA) would be visible to varying degrees during the night throughout the seen area of the stacks and towers, depending on their heights and atmospheric conditions (see Section 4.7.2.5, *Night Sky Effects,* for further discussion). Although not anticipated to have an adverse impact on any developed recreation opportunities within the Station project area, Station facilities may negatively affect the visual quality of those recreational experiences that are dispersed in nature. The power plant could potentially be seen along slopes immediately adjacent to the valley, including part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness. Because designated Wilderness is intended to provide for the experience of an area being "untrammeled by man," (Wilderness Act) this could present a negative recreational experience to the user.

Potential Conflicts with Construction-Related Truck Traffic

Construction-related truck traffic may have a temporary effect on local roadways by delaying access to recreation areas in the Station project area because of the slow-moving nature of trucks hauling materials to construction sites. Given the dispersed nature of the recreational opportunities in the region, the relatively light traffic in the area, and the temporary nature of construction-related travel on local roadways, these potential effects are considered to be minor and would be temporary.

Access Road Impacts

As part of the Proposed Action, some existing dirt roads would be improved for enhanced access, and several new spur roads would be constructed. These improved and new roads leading from existing state and county roads to the Station project area may increase accessibility into areas that were previously inaccessible. Because these access road improvements would primarily occur on federal lands and such activities as dispersed recreation and general sightseeing/nature viewing are currently permitted on most BLM administered lands, no adverse effect to recreational resources would occur. These access roads would not traverse or restrict access to existing developed recreation sites, as none exist in the immediate Station project area. These access roads would not traverse or restrict access to existing developed recreation sites, as none exist in the immediate Station project area. Improved access would provide increased access opportunities for dispersed recreational four-wheel-drive use, hiking, or general sightseeing.

Impacts to Developed Recreational Access and Visitation

The closest developed recreation site to the proposed Station is the Goshute Cave Recreation Area, in the Goshute Canyon Wilderness, approximately 6 miles from the location of the proposed water pipeline. The Egan Crest Trailhead, along U.S. 50, is approximately 15 miles from the proposed Thirtymile Substation. Station transmission lines and the water pipeline would traverse only a few roadways within BLM administered lands that provide access to these and the other developed and dispersed recreational resources in the Station project area. Visitation to these sites is largely dependent on automobile access via local highways. Any impacts to these roads during construction would be temporary, and no closures are anticipated. Because no alterations to these roads are expected and the transmission lines would span these routes, allowing unrestricted access beneath them, the proposed Station is anticipated to have little, if any, temporary effect on developed recreational access or visitation rates. Consequently, no impacts to access or visitation of developed state or county recreation areas are anticipated either.

Based on the estimated proportion of non-local workers serving the proposed Station, an average short-term increase in population of up to approximately 700 people would occur during the construction period. As many as 900 to 1,000 new residents would live in the area during peak periods. As such, it can be expected that there would be an increase in the use of developed recreation facilities and sites as well as dispersed recreation throughout the Station project area. As part of this, use of roads and access points for recreation may increase as well. It is not anticipated that this increase would adversely impact the current use of developed recreation sites or access to those sites. This increased workforce also may lead to an increased use of local municipal recreation facilities. It is not anticipated that this increase would adversely impact the current use of local facilities.

4.8.1.1.2 Impacts to Private Recreational Opportunities

Several privately run campgrounds and recreational vehicle (RV) parks are located in the Station study area, primarily south of the City of Ely. Potential impacts to these facilities may result from increased use by Station workers as they use these facilities for temporary housing while in the area. There also may be increased use of Basset Lake resulting from Station workers seeking a nearby location at which to fish during their free time.

4.8.1.1.3 Potential Conflicts with Recreational Plans or Policies

The Station Proposed Action does not conflict with existing recreational plans or policies. The BLM recreation goals and policies, as described in the Egan Resource Area Resource Management Plan, are primarily related to WSAs or Wilderness or general enhancements to dispersed recreation on an area-wide basis. The proposed Station would avoid all Wilderness, and no specific BLM recreational goals or policies are directed toward the areas proposed for the Station Proposed Action facilities. However, the power plant could potentially be seen along slopes immediately adjacent to the valley, including part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness. Because designated Wilderness is intended to provide for the experience of an area being "untrammeled by man," this could present a negative recreational experience to the user.

Recreational goals and policies contained in the White Pine County Land Use Plan are primarily concerned with improving recreational opportunities within the more urbanized portions of the county where county-run recreational resources are located. No specific recreational policies are in place in areas that would be affected by the Proposed Action.

The water pipeline ROW would cross the Pony Express National Historic Trail in Steptoe Valley at the intersection of the pipeline and White Pine County Road 18. This trail has value from a recreationist's perspective as well as a historical resource and, therefore, is briefly discussed here. The NPS identifies this segment of the trail (Overland Canyon to Simpson Park Station) as a "high-potential segment" with high scenic resource values (NPS, 2000). This portion of the Pony Express Trail would be in the seen area of the power plant. Some of the power plant facilities, such as the power blocks, stacks, and cooling towers, would be visible to varying degrees, as would some night lighting. Berms for the evaporation pond and solid waste disposal areas would be seen as long horizontal forms in the landscape. It should be noted that the segment of the Pony Express Trail closest to the Proposed Action power plant site is not located in a pristine setting. This part of the trail route follows a developed road (County Road 18) and crosses U.S. 93 near an area that has commercial buildings, a paved parking area, and rest stop. (See discussion in Section 4.7, *Visual Resources,* for further detail on visual impacts.) Because the Pony Express Trail in this location lies within a heavily modernized area, no impacts on recreation or conflicts with the National Park Service Historic Trails Management Plan are anticipated for the Proposed Action.

4.8.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.8.2 Alternative 1

4.8.2.1 Impacts

Alternative 1 varies from the Proposed Action primarily in the location, size, and layout (see Figure 2-8 in Chapter 2) of the power plant site and in the initial 6 miles of the transmission lines. The Alternative 1 power plant site is approximately 10 miles south of the Proposed Action power plant site and is about 50 acres larger (1,330 acres total). The Alternative 1 transmission line would run approximately 6 miles northwest from the Alternative 1 substation where it would intersect with the SWIP utility corridor, and then continue south identical to the Proposed Action route. The 600-foot-tall stacks and 500-foot-tall cooling towers seen area under Alternative 1 would be less visible at the northern parts of Steptoe Valley than under the Proposed Action. The seen area for each successively lower stack and cooling tower height would be somewhat reduced as depicted in Photo (Simulation) 4.7-2. It is not anticipated that the power plant would be seen along slopes immediately adjacent to the valley, including part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness as in the Proposed Action. The overall impact on recreation resources under Alternative 1 would be very similar to those described for the Proposed Action. Potential impacts on recreational opportunities on federal, state, local, and private lands and potential conflicts with recreational plans or policies under Alternative 1 would be similar to those described for the Proposed Action in Section 4.8.1.1.

4.8.2.2 Mitigation

No mitigation is required for Alternative 1.

4.8.3 Connected Actions

4.8.3.1 SWIP

Major concerns associated with recreation, parks, and preservation areas would include potential physical impacts to the Pony Express Trail (west of the White Pine Energy Station Proposed Action power plant site), the California Trail Backcountry Byway, and the California National Study Trail in Nevada; and the Minidoka Relocation Center interpretive site and the Oregon Trail in Idaho. Impacts would be minimized by placing towers at the maximum feasible distance from where these areas would be crossed or visible. Impacts to the quality of the recreational/scenic use experience would be expected where SWIP transmission lines and towers cross or are near U.S. 93, which is a designated scenic route (BLM, 1993).

4.8.3.2 NNR

The rehabilitation and operation of the NNR would not adversely impact recreation in the White Pine Energy Station project area. The NNR would not affect access to recreation uses near the NNR. Expansion of NNR tourist train operations between McGill Junction and Shafter would have a beneficial effect on tourist recreation. Sport fishing opportunities in Tailings Creek near milepost 124 could be impacted by placing fill in the creek to stabilize the track bed (David Evans and Associates, Inc., 2002). This location is south of the White Pine Energy Station Proposed Action and Alternative 1 rail spur sites at mileposts 103 and 115, respectively.

4.8.4 No Action Alternative

No project-related impacts on recreation resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.9 Land Use

This section examines potential impacts of the proposed White Pine Energy Station on land use and access. The primary land use issues associated with the Station are related to potential physical conflicts with land uses or restriction of access (for example, conflicts with grazing areas, mining operations, private lands, or transportation routes). Other issues examined in this section include the Station's potential conflict with applicable land use and resource management plans of federal, state, and local agencies.

Impact Criteria

Station construction and operation activities would be considered to have an adverse impact on land use and access if they would result in one or more of the following (BLM, 2001):

- Permanently preclude a permitted or current land use over a substantial area
- Permanently displace existing, developing, or approved urban/industrial buildings or activities over a substantial area (residential, commercial, industrial, governmental, or institutional)
- Conflict with an existing ROW
- Substantially conflict with applicable general and regional plans and/or approved or adopted policies, goals, or operations of communities or governmental agencies

4.9.1 Proposed Action

4.9.1.1 Impacts

4.9.1.1.1 Existing Land Uses and Ownership

The power plant site for the Proposed Action encompasses approximately 1,281 acres. This land has been identified for disposal by the BLM and upon sale would be removed from BLM permanent holdings. Transferring ownership of the 1,281-acre parcel from public to private ownership would preclude the continuation of existing land uses on the fenced site. The following sections analyze potential impacts on land use and access that are relevant to the Proposed Action.

Potential Impacts on Land Uses on Private Property

The Proposed Action would be located in sparsely populated areas containing little or no development. Most elements of the Proposed Action would occur primarily on undeveloped lands. Impacts on existing or developing residential, commercial, industrial, governmental, or institutional uses are generally expected to be low given the infrequency of these uses in the Proposed Action project area and the relatively far distance between these uses and Station facility sites. The nearest developed community is McGill, approximately 21 miles south of the Proposed Action power plant site and 7 miles from any other Station facility site.

It is anticipated that 2,510 acres of public land and no private land would be impacted as a result of ROWs for the Proposed Action. These would consist of 101 acres of temporary ROWs and 2,409 acres of permanent ROWs. The nearest private structure to any one element of the proposed Station is a single-family residence located within 1 mile of the northernmost section of the water pipeline. Construction of the underground water pipeline would result in only a temporary disturbance. A related construction access road, approximately 40 feet wide, for the pipeline would be minimally used but maintained after installation.

Because of the potential increase in population in White Pine County resulting from Station construction, the Proposed Action would likely result in a short-term need for temporary rental housing or other accommodations to serve the construction workforce. These workers would likely temporarily relocate to the Station project area during construction, traveling to/from their permanent residence as their services are needed. Although temporary housing has been sufficient in the past as evidenced by high vacancy rates for rental units, the re-opening of the Robinson Mine near Ruth, Nevada, has caused a current shortage of available rental housing in White Pine County. However, sufficient motel and/or RV space appears to be available in the county to accommodate construction workers that may stay in the local area during the standard work week (Rajala, 2005). Section 4.17, *Socioeconomics,* elaborates further on the potential impact to the local economy.

Table 4.9-1 identifies the ROW requirements associated with major Station features for the Station Proposed Action and Alternative 1. Information presented in Table 4.9-1 is based on acres of temporary and permanent ROWs that would be required for Station facilities as summarized in Table 2-1 in Chapter 2. Table 4.9-2 identifies the developed land uses that would be within 1,000 feet and within 1.5 miles of the Station centerline for the Proposed Action and Alternative 1.

Potential Impacts on Grazing

Once the 1,281-acre parcel for the Proposed Action power plant site is transferred from public to private ownership, grazing would no longer be permitted. Although the transmission line towers and water pipeline access road may temporarily disturb or remove some grazing allotment land, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments. Grazing could continue beneath the transmission lines. As such, it is anticipated that other than the removal of grazing on the Proposed Action power plant site itself, the overall Station would result in minimal impacts to grazing. Section 4.10, *Rangeland Resources*, provides a more detailed analysis of the impacts to livestock grazing.

Potential Impacts on Mining

Section 4.2, *Geology, Soils, and Minerals*, provides an analysis of potential interference of the Proposed Action with active mining operations and mining districts. The proposed transmission line would cross three mining districts (Telegraph, Hunter, and Granite Districts). None of these districts are currently active, however, and this land use category only generally indicates areas with mining potential or areas that have been previously mined. The Proposed Action power plant site is not located within an existing mining district. Similarly, none of the ancillary power plant infrastructure sites (water wells and water pipeline) are located within an existing mining district.

Potential Impacts on Transportation Routes

As shown in Table 4.9-3, the route of the Proposed Action would cross existing major and minor roads, as well as a railroad line. Final design of the selected route would place transmission towers to avoid conflicts with transportation routes. The impact of construction activities on transportation routes is expected to be only temporary. The major impact would likely be a slight delay in the speed of traffic on minor roads as a result of slow moving construction vehicles. However, there may be occasion when a road may need to be closed temporarily for transmission line stringing operations.

TABLE 4.9-1

Land Uses Direct Impacts

Segment[d]	Public (BLM) (acres)
Proposed Action	
Power plant site and associated facilities[a] (footprint)	1,281
Transmission line ROW and associated facilities[b] (200/500 feet)	1,042
Water pipeline ROW and associated facilities[c] (60 feet)	118
Railroad spur ROW (35 to 70 feet)	14
Alternative 1	
Power plant site and associated facilities[a] (footprint)	1,330[f]
Transmission Line ROW and associated facilities[b] (200/500 feet)	1,116
Water pipeline ROW and associated facilities[c] (60 feet)	74
Railroad spur ROW (35 to 70 feet)	34

[a] Associated facilities include access road.

[b] Associated facilities include substations and substation access road.

[c] Associated facilities include wellheads.

[d] An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

[e] Rounded to next whole acre.

[f] Includes 80 acres to be transferred to the Ely Shoshone Tribe pursuant to the White Pine County Conservation, Recreation, and Development Act of 2006

Source: EDAW GIS analysis, May 2005.

TABLE 4.9-2

Developed Land Uses and Distance from Center Line

Segment[d]	Distance 1,000 feet	Distance 1.5 mil es	Type of Use	Adjacent
Proposed Action				
Power plant site and associated facilities[a]	0	0	N/A	
Transmission line ROW and associated facilities[b]	0	0	N/A	
Water pipeline ROW and associated facilities[c]	2	3	Single Family Residential, Agricultural Deferred	
Railroad spur ROW	0	0	N/A	
Total	**2**	**3**		

TABLE 4.9-2

Developed Land Uses and Distance from Center Line

	Distance			
Alternative 1				
Power plant site and associated facilities[a]	0	1	Agricultural Deferred	Indian Trust Lands
Transmission line ROW and associated facilities[b]	0	1	Agricultural Deferred	Indian Trust Lands
Water pipeline ROW and associated facilities[c]	2	3	Single Family Residential, Agricultural Deferred	
Railroad spur ROW	0	0	N/A	
Total	**2**	**5**		

[a] Associated facilities include access road.
[b] Associated facilities include substations and substation access road.
[c] Associated facilities include wellheads.
[d]An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

Source: EDAW GIS analysis, May 2005; White Pine County 2005b.

TABLE 4.9-3

Road Crossings by Segment and Route Alternative In the Station Project Area[a]

Segment[d]	Number of Major Road Crossings	Number of Minor Road Crossings	Total Road Segment Crossings
Proposed Action			
Power plant site and associated facilities[a]	0	0	0
Transmission line ROW and associated facilities[b]	1	4	5
Water pipeline ROW and associated facilities[c]	3	2	5
Railroad spur ROW	0	0	0
Total	**4**	**6**	**10**
Alternative 1			
Power plant site and associated facilities[a]	0	0	0
Transmission line ROW and associated facilities[b]	1	4	5
Water pipeline ROW and associated facilities[c]	3	2	5
Railroad spur	0	0	0
Total	**4**	**6**	**10**

[a] Associated facilities include access road.
[b] Associated facilities include substations and substation access road.
[c] Associated facilities include wellheads.
[d] An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

Source: EDAW GIS analysis, May 2005.

During transmission line stringing phases, it may be necessary to erect temporary structures over major roadways to position un-tensioned lines away from potential ground-based conflicts. Access beneath these structures would remain largely unrestricted, with few closures or other alterations to existing transportation routes occurring. In some cases, NDOT may require temporary road closures for some construction activities (BLM, 2001a). The location of the water pipeline would also cross various roadways along the Proposed Action route. Any road closures resulting from pipeline installation would be subject to the same regulations as those closed for transmission line construction.

As discussed in Chapter 2, numerous existing dirt access roads have been identified for possible use during construction and maintenance of the power plant site, transmission line, and water pipeline. Some of these dirt roads would require improvements and/or paving to enable construction vehicles and large equipment to access the construction areas. Impacts from these actions might include slow moving traffic and possible temporary road closures while paving takes place. A benefit to these actions is possible paved roads where dirt roads once existed.

Construction access to the Thirtymile Substation would be via U.S. 50 over an existing dirt road as well as a new dirt or gravel road that would extend to the substation site. The existing dirt road would not be paved, but would be widened (ROW width of 30 feet) and improved to a condition suitable for construction and permanent access. Any impacts resulting from this action would be temporary and the road would be improved as a result.

Access to the water pipeline would be via existing roads to the extent possible. Impacts from these actions might include slow moving traffic and would be temporary.

4.9.1.1.2 Designated Land Uses

Potential Impacts on BLM Land Use Authorizations

Many of the segments of the Proposed Action would traverse or be located adjacent to existing BLM land use authorizations (see Table 4.9-4). These are primarily in the form of ROWs for other transmission lines, roads, telephone lines, water facilities, recreation or public purpose leases, airport leases, and material sites for road construction. Any time a portion of the Proposed Action would conflict with an existing land use authorization, consultation with the holder of the respective land use authorization about any possible direct impacts to current use would occur. This may also include locating any existing utilities and obtaining any required permits from the BLM for permission to cross the authorization, as well as obtaining any other necessary permits from state and county authorities.

Potential Conflicts with Land Use Plans and Policies

Potential conflicts with federal, state, and county land use plans are discussed in the following text.

TABLE 4.9-4

BLM Land Use Authorizations in or Adjacent to Site/Row

Segment[d]	Number of Land Use Authorizations	Largest land Holder(s) in Terms of acreage	Number of Land Use Authorizations Crossed	Name of Land Holders Crossed
Proposed Action				
Power plant site and associated facilities[a] (footprint)	0	N/A	0	N/A
Transmission line ROW and associated facilities[b] (200/350/500 feet)	23	Sierra Pacific Power, WPEA, Idaho Power, NDOT	17	Sierra Pacific Power, Sierra Touch America, AT&T, NDOT, Mt. Wheeler Power, BLM, White Pine Cty, JDL Const.
Water pipeline ROW and associated facilities[c] (60 feet)	42	BLM, Mt. Wheeler Power, NDOT	17	NDOT, Mt. Wheeler Power, Greg Chacas, Nevada Bell, BLM
Railroad spur ROW (35 to 70 feet)	1	Intermountain Power	0	N/A
Total[e]	**66**		**34**	
Alternative 1				
Power plant site and associated facilities[a] (footprint)	1	BLM	0	N/A
Transmission line ROW and associated facilities[b] (200/350/500 feet)	20	Sierra Pacific Power, WPEA, Idaho Power, NDOT	14	Sierra Pacific Power, Sierra Touch America, AT&T, Mt. Wheeler Power, BLM, Intermountain Power
Water pipeline ROW and associated facilities[c] (60 feet)	42	BLM, Mt. Wheeler Power, NDOT	17	NDOT, Mt. Wheeler Power, Greg Chacas, Nevada Bell, BLM
Railroad spur ROW (35 to 70 feet)	1	Intermountain Power	1	Intermountain Power
Total[e]	**64**		**32**	

[a] Associated facilities include access road.

[b] Associated facilities include substations and substation access road.

[c] Associated facilities include wellheads.

[d] An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

[e]Some authorizations may be affected by two or more ROWs, and therefore have been counted separately.

Source: BLM LR2000 database report, Run date: 05/17/05.

BLM Resource Management Plans and Policies

The Egan Resource Area Resource Management Plan contains policies related to existing and planned utility corridors in these planning areas. The Resource Management Plan designates utility corridors and identifies additional miles of planning corridors. The Resource Management Plan contains policies which state that applicants for use of a corridor would be required to locate new facilities proximate to existing facilities, except where considerations of construction feasibility, cost, resource protection, or safety are over-riding. Most of the length of the Proposed Action transmission line (32.5 miles) and facilities would be located within the existing SWIP utility corridor. However, the potential exists when specific siting is done along the utility corridor that the transmission line may be located outside the corridor at specific locations if deemed appropriate to mitigate or minimize potential impacts to a resource.

County Land Use Plans and Policies

The Proposed Action would traverse small amounts of private land administered by White Pine County. The White Pine County Land Use Plan contains no goals or strategies related specifically to utilities or utility corridors, other than a provision for the efficient use of community infrastructure.

4.9.1.1.3 Temporary Impacts

Existing roads would be used to access the electrical transmission line alignment for construction purposes. Some additional temporary access between tower sites may be required during construction. In a worst-case analysis, no more than 129 acres would be temporarily disturbed by a construction access road between towers. This assumes the road would be 30 feet wide, about 35.25 miles long (the length of the entire corridor), and there would be no other access points to towers from existing roads. Temporary road segments between towers would be allowed to revegetate naturally following construction. Permanent access for inspection and maintenance of the electrical transmission line would not be required and there would be no long-term access road disturbance. Temporary ground disturbance would also take place during construction of each of the footings for the electric towers. Ground disturbance is estimated to average approximately 1 acre. In total, an estimated 144 towers would be located along the 35.25-mile-long transmission corridor, with approximately 144 acres temporarily disturbed during their construction. Disturbed areas beneath the towers would be allowed to revegetate naturally following construction.

An additional 30 feet of temporary ROW (60-foot wide ROW total during construction) would be required for construction of the 12-mile-long water supply system, disturbing up to an additional 88 acres along the pipeline route during construction. This access road would be minimally used, but maintained, following construction of the water supply system. Some temporary ROW and construction disturbances (up to 50 acres) also may be required at locations along the route for construction equipment and material laydown and staging. Two or three staging areas would be required to support construction of the water pipeline and electric distribution lines serving the well field. Potential use of existing NDOT material sites along U.S. 93 as staging areas would minimize new vegetative disturbance and related impacts. Additional minimal, but presently unknown, construction ROWs may be required for water storage tanks or pumping stations if needed to support the water supply system.

4.9.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.9.2 Alternative 1

4.9.2.1 Impacts

4.9.2.1.1 Existing Land Use and Ownership

The power plant site for Alternative 1 totals 1,330 acres. This land has been identified for disposal by the BLM and upon sale would be removed from BLM permanent holdings. Pursuant to the White Pine County Conservation, Recreation and Development Act of 2006 (PL 109-432) the SW1/4 and SE1/4 of the NW1/4 of Section 28, containing 80 acres more or less of the Alternative 1 power site is to be held in trust by the United States for the benefit of the Ely Shoshone Tribe. The Act effectively reduces the size of the Alternative 1 power plant site available for disposal by BLM for use in developing the Station. The Alternative 1 solid waste disposal and transmission facilities immediately north of the proposed Duck Creek Substation are within or cross land identified in the Act for transfer to the Ely Shoshone Tribe. Because the reported uses of the lands by the Tribe are energy-related economic development, development and operation of the Station on adjacent BLM land would not be a conflicting land use with the newly acquired Tribal lands. Transferring ownership of the 1,330-acre parcel from public to private would preclude the continuation of existing recreational opportunities on the fenced site. The following sections analyze potential impacts to land use and access that would be relevant to Alternative 1.

Potential Impacts on Land Uses on Private Property

The Alternative 1 power plant site would be 12 miles south of the Proposed Action power plant site. As such, the land and land use in the area is much the same as described for the Proposed Action. The area encompasses sparsely populated areas containing little or no development. Impacts on existing or developing residential, commercial, industrial, governmental, or institutional uses are generally expected to be low given the infrequency of these uses in the project area and the relatively far distance between these uses and the route alternatives. The nearest community is McGill, approximately 11 miles south of the Alternative 1 power plant site and 7 miles from any other project facility site.

Because of the potential increase in population in White Pine County resulting from project construction, Alternative 1 would likely result in a short-term need for temporary rental housing or other accommodations to serve the construction workforce. These workers would likely temporarily relocate to the project area during construction, traveling to/from their permanent residence as their services are needed. Although temporary housing has been sufficient in the past as evidenced by high vacancy rates for rental units, the re-opening of the Robinson Mine near Ruth, Nevada, has caused a current shortage of available rental housing in White Pine County. However, sufficient motel and/or RV space appears to be available in the county to accommodate construction workers that may stay in the local area during the standard work week (Rajala, 2005). Section 4.17, *Socioeconomics,* elaborates further on the impact to the local economy.

Tables 4.9-1 and 4.9-2 present information for Alternative 1 facility sites on general land uses and land uses near project centerlines, respectively. It is anticipated that 2,568 acres of public land and 59 acres of private land would be impacted as a result of ROWs for Alternative 1. This represents more than 97 percent public land and less than 3 percent private land. Current uses of the private land include recreation, grazing, residential, and other minor improvements including, but not limited to, fencing and outbuildings. The transmission line extending from the proposed power plant site of Alternative 1 would cross private property in Section 19, T20N, R54E. The current use of this land is identified as agricultural deferred.

Construction of the underground pipeline would result in only a temporary disturbance. A related construction access road, approximately 30 feet wide, for the pipeline would be minimally used but maintained after installation.

Potential Impacts on Grazing

Although the transmission line towers and water pipeline access road may remove some grazing allotment land, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments. Grazing could continue with little impact beneath the transmission lines.

Potential Impacts on Mining

No mining-related effects would occur under Alternative 1, the same as described for the Proposed Action.

Potential Impacts on Transportation Routes

Potential impacts on transportation routes and traffic access, delays, and speed would be the same as described for the Proposed Action.

4.9.2.1.2 Designated Land Uses

Potential impacts on BLM Land Use Authorizations

Types of potential impacts on BLM land use authorizations under Alternative 1 would be the same as described for the Proposed Action.

Potential Conflicts with Land Use Plans and Policies

Potential conflicts with federal, state, and county land use plans are discussed in the following text.

The utility routes for Alternative 1 would be similar to the Proposed Action except that the transmission line and water pipeline routes would differ as described in Chapter 2.

BLM Resource Management Plans and Policies

The discussion presented for the Proposed Action regarding the Egan Resource Area Resource Management Plan and potential impacts also applies to Alternative 1. Under Alternative 1, the majority of the length of the transmission line (24 miles) and facilities would be located within the existing SWIP utility corridor. However, when specific siting is done, the potential exists along the 30.25-mile-long utility corridor that the transmission line may be located outside the corridor at specific locations if deemed appropriate to mitigate or minimize potential impacts on a resource.

County Land Use Plans and Policies

Alternative 1 would traverse only small amounts of private land administered by White Pine County. The White Pine County Land Use Plan contains no goals or strategies related specifically to utilities or utility corridors, other than a provision for the efficient use of community infrastructure. Alternative 1 should have little or no effect on local infrastructure.

4.9.2.1.3 Temporary Impacts

Existing roads would be utilized to access the electrical transmission line alignment for construction purposes. Some additional temporary access between tower sites also may be required during construction. In a worst-case analysis, no more than 110 acres would be temporarily disturbed by the construction access road between towers. This assumes the road would be 30 feet wide, approximately 30.25 miles long (the length of the entire corridor), and there would be no other access points to towers from existing roads. Temporary road segments between towers would be allowed to revegetate naturally following construction.

An additional 30 feet of temporary ROW (60-foot-wide ROW total during construction) would be required for construction of the 8-mile-long water supply system, disturbing up to an additional 58 acres along the pipeline route during construction. This access road would be minimally used, but maintained, following construction of the water supply system. Some temporary ROW and construction disturbances (up to 50 acres) also may be required at locations along the route for construction equipment and material laydown and staging. Two or three staging areas would be required to support construction of the water pipeline and electric distribution lines serving the well field. Potential use of existing NDOT material sites along U.S. 93 as staging areas would minimize new vegetative disturbance and related impacts. Additional minimal, but presently unknown, construction ROWs may be required for water storage tanks or pumping stations if needed to support the water supply system.

4.9.2.2 Mitigation

Relocation of the Duck Creek Substation electrical transmission lines, and solid waste disposal facility within the Alternative 1 power plant site may serve to avoid or minimize land use conflicts with designated Ely Shoshone Tribal lands.

4.9.3 Connected Actions

4.9.3.1 SWIP

Major land use concerns were to avoid or minimize potential impacts to existing and planned land uses along the SWIP corridor, including agricultural improvements (for example, water tanks, windmills, wells, and corrals), irrigated prime and unique farmlands, gravel pits or quarries, residences, and a school (BLM, 1993). Potential conflicts with these features and land uses would be avoided or minimized through transmission line routing and tower placement, and would result in low to no identifiable impacts (BLM, 1993).

Major concerns regarding Air Force military training areas from the Ely area to Dry Lake in southern Nevada would result from transmission lines and towers that directly conflict with low-level flight training operations and are hazardous to pilots. The Air Force also would have to alter flight plans and established training operations. The use of shorter towers in military training areas would be expected to result in a moderate rather than a high level of impacts (BLM, 1993).

There would be the potential for impacts to land uses and features at the Thousand Springs Series Compensation Station site (range improvements, railroad, oil wells). These impacts would be reduced to a low level of effect by siting the facilities to avoid sensitive land uses and or restoring/replacing affected land uses (BLM, 1993).

4.9.3.2 NNR

The rehabilitation and reinstatement of NNR operations would not impact land uses in the project area. The current NNR Rail Line configuration would not be altered, and existing and planned land uses on adjacent areas would not be affected (David Evans and Associates, Inc., 2002). The NNR Rehabilitation Plan does not constitute a deviation from the location or alignment of the existing track and facilities and it does not constitute a change in the use or operation from the original Rail Line Agreement between the BLM and the City of Los Angeles Department of Water and Power (CRS and MSC, 2005).

4.9.4 No Action Alternative

Under the No Action Alternative, impacts on land use and access associated with the proposed WPES Project would not occur. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.10 Rangeland Resources

For purposes of this discussion, "short-term" is defined as the period during project construction (approximately 16 months for the transmission line and 6 months for the water supply line) and shortly thereafter during initial project operation. "Permanent" is defined as the entire commercial life of the Station Proposed Action and Alternative 1, which is estimated to be at least 40 years. After this time the Station could be decommissioned or continue with its proposed use. Implementation of the Station Proposed Action or Alternative 1 would necessitate uses of the environment whose effects would be apparent during Station construction and operation, and which would result in both beneficial and adverse effects on permanent productivity.

4.10.1 Proposed Action

4.10.1.1 Impacts

4.10.1.1.1 Livestock Grazing.

Although the transmission line towers and water pipeline access road may cause short-term disturbances or remove some grazing allotment land, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments. The water pipeline would be located underground and cause only short-term disturbance during construction. However, the pipeline wells and construction access road would result in the permanent disturbance of land. While the road is anticipated to be only minimally used, it would be maintained. The following grazing allotments would be crossed by one or more of the Proposed Action ROWs:

- Middle Steptoe
- Thirty Mile Spring
- North Steptoe
- Steptoe
- South Butte
- Cherry Creek
- Gold Canyon
- Medicine Butte
- Butte Seeding

Table 4.10-1 shows the number and size (acres) of the grazing allotments that would be permanently impacted by the construction and operation of Station features for the Proposed Action and Alternative 1. The power plant sites for the Proposed Action and Alternative 1 would remove the most amount of land from grazing during the life of the project. Grazing could continue unrestricted beneath the transmission lines. As such, it is anticipated that the Station would result in minimal impacts on grazing.

Fencing that is within the ROW of the transmission line, water supply line, or railroad spur would be removed during construction to allow for continual access to the construction site. After construction the fencing would be replaced along the transmission line. If fencing would obstruct the maintenance road along the water supply line, it would not be replaced. Cattle guards would be used instead. No change is anticipated in either the availability or quality of forage.

TABLE 4.10-1

Grazing Allotments Permanently Impacted by the White Pine Energy Station Proposed Action and Alternative 1

Segment	Number	Size (acres)
Proposed Action		
Power plant site and associated facilities[a]	2	1,293
Transmission line and associated facilities[b]	7	197
Water pipeline and associated facilities[c]	4	17
Railroad spur	1	9
Alternative 1		
Power plant site and associated facilities[a]	1	1,298
Transmission line and associated facilities[b]	7	201
Water pipeline and associated facilities[c]	2	11
Railroad spur	2	24

[a] Associated facilities include access road.
[b] Associated facilities include substations and substation access roads.
[c] Associated facilities include wellheads.

Note: An additional 30 acres would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW, however the disturbance is anticipated to be short-term.

Source: EDAW GIS analysis, May 2005.

4.10.1.1.2 Wild Horses

Butte Herd Management Area (HMA)

Approximately 47 acres (13 miles by 30 feet) would be disturbed in the short-term within the Butte HMA because of construction of the transmission line from the Proposed Action site for the access road. The proposed transmission line would run along the edge of the Butte HMA from its intersection with Water Canyon on the eastern bench of the Egan Range southwest to its intersection with Rock Spring Canyon.

An estimated 68 electric transmission towers would be located along the 13 mile-long transmission corridor through the Butte HMA, with approximately 68 acres disturbed in the short term during construction. The 68 tower footings would result in a combined total permanent disturbance of less than 1 acre. Disturbed areas beneath the towers would be allowed to revegetate naturally following construction.

No substantial change in forage availability or quality would be expected because of the construction of the transmission line. The change in forage availability would not alter BLM's determination of Appropriate Management Level for the Butte HMA. The quantity of disturbed land in the Butte HMA would be approximately 0.01 percent of its total land area. The location of the transmission line, near the southern edge of the HMA, would further reduce the likelihood of disrupting the foraging patterns of wild horses. Wild horses in this HMA tend to stay on its west side, although some have been identified on Telegraph Hill in the Egan Range.

Antelope HMA

The water supply line would run through the Antelope HMA for approximately 4 miles between U.S. 93 and the NNR on the southern border of the HMA to just north of SR 489. The proposed location of the water supply system is constrained by defined well locations as specified under water right permits issued to White Pine County by the Nevada State Engineer's Office.

A permanent disturbance within the Antelope HMA of 14.5 acres would result from the water supply line, and an additional 1.5 acres would result from the three wells along the water supply line. The permanent ROW also would include a 40-foot-wide construction access road of dirt or gravel along the water supply line route and to the eight wells. The access road would be maintained, but minimally used, following construction of the water supply system. A minimal, but presently unknown, quantity of permanent ROW acreage may be required for water storage tanks or pumping stations if needed to support the water supply system.

Electric service to the wells would be extended from existing electric lines near the wells. The route for the new electric distribution lines would follow existing ROWs (roads, pipeline, etc.), the water supply system ROW, or existing features to the extent practicable.

Communication lines needed to remotely operate the wells would either be buried with the pipeline or placed on overhead electric distribution line poles. Wireless communication systems may also be used.

No substantial change in forage availability or quality is expected to occur because of the construction of the water supply line. The change in forage availability will not alter BLM's determination of Appropriate Management Level for the Butte HMA. The quantity of disturbed land in the Antelope HMA would be approximately 0.004 percent of its total land area. Also, an existing fence west of U.S. 93 and extending its length provides a barrier between the water supply line and the rest of the HMA.

4.10.1.2 Mitigation

4.10.1.2.1 Livestock Grazing

No mitigation is required for the Proposed Action.

4.10.1.2.2 Wild Horses

If foaling horses are present, Station construction in the Butte and Antelope HMAs will be scheduled to occur outside of the foaling season, which is primarily in the spring.

4.10.2 Alternative 1

4.10.2.1 Impacts

4.10.2.1.1 Livestock Grazing.

Although the transmission line towers and water pipeline access road may remove some grazing allotment land under Alternative 1, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments (see Table 4.10-1). The water pipeline would be located underground and result in only short-term disturbance. However, the pipeline wells and construction access road would result in the permanent disturbance of land. While the road is anticipated to be minimally used, it would be maintained. The following grazing allotments would be crossed by one or more of the Alternative 1 ROWs:

- Becky Springs
- Middle Steptoe
- Heusser Mountain
- Thirty Mile Spring
- North Steptoe
- Duckcreek Flat
- Steptoe
- South Butte
- Cherry Creek
- Medicine Butte
- Butte Seeding

Grazing could continue unrestricted beneath the transmission lines. Fencing that is within the ROW of the transmission line, water supply line, or railroad spur would be removed during construction to allow for continual access to the construction site. After construction, fencing would be replaced along the transmission line. If fencing would obstruct the maintenance road along the water supply line, it would not be replaced. Cattle guards would be used instead.

4.10.2.1.2 Wild Horses

Impacts on wild horses in the Butte HMA under Alternative 1 would be the same as described for the Proposed Action (see Section 4.10.1.1.2, *Wild Horses*). Alternative 1 would not affect the Antelope HMA.

4.10.2.2 Mitigation

If foaling horses are present, Station construction in the Butte HMA will be scheduled to occur outside of the foaling season, which is primarily in the spring.

4.10.3 Connected Actions

4.10.3.1 SWIP

Construction of the SWIP would be expected to have generally similar kinds of effects on livestock grazing and wild horses as described for the construction of transmission lines for the White Pine Energy Station. SWIP tower footings would occupy a relatively small portion of the total land available for grazing, and land beneath the transmission lines would be open to unrestricted use by livestock and wild horses. The amount of land disturbed would be relatively small and dispersed along the entire length of the SWIP corridor and along numerous grazing allotments. No substantial change in forage availability or quality for wild horses or livestock would be expected because of the construction of the SWIP.

4.10.3.2 NNR

Rehabilitation of the NNR would not adversely impact livestock grazing or wild horses, except possibly for some localized short-term disturbance during NNR construction. There is the potential for wild horses and livestock to be hit and injured or killed by trains during operation of the NNR.

4.10.4 No Action Alternative

No Station-related impacts on livestock grazing or wild horses would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.11 Wilderness and Areas of Critical Environmental Concern

As described in Section 3.11, *Wilderness and Areas of Critical Environmental Concern,* the White Pine County Conservation, Recreation and Development Act of 2006 was passed by Congress on December 20, 2006. This bill provides for 545,000 acres of Wilderness through the establishment of 12 new areas and the expansion of two existing areas.

This section also provides a discussion of the relevant management plans and policies that may be impacted. It is anticipated that an increase in visitation to Wilderness within the Station project area would result from the increase in workforce during construction of the power plant. Because no Areas of Critical Environmental Concern (ACECs) exist in the study area, there would be no impacts on these particular resources.

4.11.1 Proposed Action

4.11.1.1 Impacts

4.11.1.1.1 Wilderness

Potential Conflicts with Construction-Related Truck Traffic

Construction-related truck traffic may have a temporary effect on local roadways by delaying access to Wilderness in the Station project area because of the slow-moving nature of trucks hauling materials to construction sites. Given the dispersed nature of Wilderness in the region, the relatively light traffic in the area, and the temporary nature of construction-related travel on local roadways, these potential impacts would be minor.

Potential Conflicts with Management Plans or Policies

The BLM goals and policies as described in the Egan Regional Management Plan (BLM, 1984b) are primarily related to general enhancements to dispersed recreation on an area-wide basis. The Proposed Action would avoid all Wilderness, and no specific BLM goals or policies are directed toward the areas proposed for the Proposed Action features. The power plant and some associated features could potentially be seen along slopes immediately adjacent to the valley, and from higher peaks within each Wilderness. Any potential visual impacts are discussed in detail in Section 4.7, *Visual Resources*.

Access Road Impacts

As part of the Station, some existing dirt roads would be improved for enhanced access, and a few new spur roads would be constructed. Because the Station features would avoid all Wilderness, no access road impacts would occur.

Impacts on Wilderness Access and Visitation

The Proposed Action power plant site is approximately 15 miles from the Goshute Canyon Wilderness, 17 miles from the Bristlecone Wilderness, 12 miles from the Becky Peak Wilderness, and 13 mile from the High Schells Wilderness. The closest other Proposed Action feature, a proposed well site, would be approximately 4 miles away from the Becky Peak Wilderness. Station transmission lines and the water pipeline would traverse only a few roadways that provide access to Wilderness in the Station project area. Visitation to Wilderness is largely dependent on automobile access via local highways. Because no alterations to local roads are anticipated as a result of the

Station and the transmission lines would span these routes allowing unrestricted access beneath them, the project is anticipated to have little or no effect on Wilderness access or visitation rates.

4.11.1.1.2 Areas of Critical Environmental Concern

Because no ACECs exist within the study area, no impacts would occur.

4.11.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.11.2 Alternative 1

4.11.2.1 Impacts

4.11.2.1.1 Wilderness

Potential Conflicts with Construction-Related Truck Traffic

Construction-related truck traffic may have a temporary effect on local roadways by delaying access to Wilderness in the Station project area because of the slow-moving nature of trucks hauling materials to construction sites. Given the dispersed nature of the Wilderness in the region, the relatively light traffic in the area, and the temporary nature of construction-related travel on local roadways, these potential impacts would be minor.

Potential Conflicts with Management Plans or Policies

The BLM goals and policies described in the Egan Resource Area Resource Management Plan are primarily related to general enhancements to dispersed recreation on an area-wide basis. Alternative 1 would avoid all Wilderness and no specific BLM goals or policies are directed toward the areas proposed for Alternative 1 features. Therefore, the Station would not conflict with BLM plans or policies.

Access Road Impacts

As part of the Station, some existing dirt roads may be improved for enhanced access, and a few new spur roads would be constructed. Because the Station features would avoid all Wilderness, no access road impacts would occur.

Impacts on Wilderness Access and Visitation

The Alternative 1 power plant site is approximately 22 miles from the Goshute Canyon Wilderness, 8 miles from the Bristlecone Wilderness, 19 miles from the Becky Peak Wilderness, and 7 miles from the High Schells Wilderness. The closest other Alternative 1 feature, the 500-kV transmission line within the SWIP corridor, would be approximately 4 miles away from the Bristlecone Wilderness.

Station transmission lines and the water pipeline would traverse only a few roadways that provide access to Wilderness in the Station project area. Visitation to these areas is largely dependent on automobile access via local highways. Because no alterations to local roads are anticipated as a result of the Station and the transmission lines would span these routes allowing unrestricted access beneath them, the Station would have little or no effect on Wilderness access or visitation rates.

4.11.2.1.2 Areas of Critical Environmental Concern

Because no ACECs exist within the study area, no impacts would occur.

4.11.2.2 Mitigation

No mitigation is required for Alternative 1.

4.11.3 Connected Actions

4.11.3.1 SWIP

See Section 4.7, *Visual Resources,* regarding Wilderness and potential effects of the SWIP.

4.11.3.2 NNR

The NNR Environmental Assessment did not specifically address Wilderness or ACECs. Figure 3.8-1 shows that the NNR does not pass through such areas.

4.11.4 No Action Alternative

No Station-related impacts on Wilderness, or ACECs would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.12 Wastes, Hazardous and Solid

This section addresses the potential for impacts from solid and hazardous waste generation, transport, and disposal during Station construction and operation.

4.12.1 Proposed Action

4.12.1.1 Impacts

No hazardous materials were found at the Station Proposed Action power plant site or are known to occur at the other Proposed Action project feature sites. Therefore, it is unlikely that hazardous materials would be found or disturbed at these sites during construction and earthmoving activities.

Station construction and operation activities could create the potential for a hazardous materials spill or require disposal of hazardous materials. BMPs described in Appendix A, *Best Management Practices,* would be implemented as an integral part of the Proposed Action to minimize or avoid the potential for a spill to occur (see section titled *Hazardous Material Storage, Handling, and Disposal and Safety Measures).* A Spill Prevention Control and Countermeasures Plan (SPCCP), outlined in this same section of Appendix A, *Best Management Practices,* would provide procedures for cleaning up in the event of a spill or release during Station construction or operation. Implementation of these environmental controls during Station construction and operation should result in no environmental impacts.

The BLM (1994) estimated the probability of an accidental release of a hazardous substance along the NNR corridor for the Robinson Mine Project. Results of that analysis are summarized below in the Connected Actions discussion in Section 4.12.3.2, *NNR*, and indicate that the probability of an accidental release is low. Based on that analysis, the probability of an accidental release of a hazardous substance in the NNR corridor over the life of the White Pine Energy Station also would be expected to be low.

4.12.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.12.2 Alternative 1

4.12.2.1 Impacts

Potential effects and BMPs associated with Alternative 1 would be the same as described for the Proposed Action.

4.12.2.2 Mitigation

No mitigation is required for Alternative 1.

4.12.3 Connected Actions

4.12.3.1 SWIP

The SWIP Final EIS did not specifically address hazardous and solid wastes (BLM, 1993). During construction of the SWIP, waste materials would be generated and disposed of at a licensed landfill.

4.12.3.2 NNR

All NNR areas would be maintained in a sanitary condition to avoid public health hazards. NNR waste materials would be disposed of at a State of Nevada approved sanitary landfill site. NNR restoration and operation would not adversely affect airport service at Yelland Airfield or conflict with airport safety and safety standards. No significant adverse impacts from the storage and use of hazardous materials (for example, pesticides, herbicides, diesel fuel, cleaning solvents) are expected because of compliance with applicable government regulations regarding their proper storage, use, and disposal (David Evans and Associates, Inc. 2002).

David Evans and Associates, Inc. (2002) stated that in the Final EIS for the Robinson Mine Project, the BLM (1994) estimated that over the 15-year operational life of the mine, 0.32 releases of diesel fuel and 2.6 releases of sulfuric acid could accidentally occur along the NNR corridor. These spills could lead to ground contamination and health hazards. The BLM (1994) concluded that the probability of a large sulfuric acid or diesel fuel release along the NNR corridor was low and that is was unlikely wildlife would be affected. David Evans and Associates, Inc. (2002) stated that if a large spill of hazardous material occurred in wetland/riparian areas along the NNR corridor, site remediation would be critical in keeping adverse impacts short-term in duration and re-establishing riparian and wetland areas.

4.12.4 No Action Alternative

There is no potential for Station-related hazardous or solid waste impacts under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.13 Cultural Resources

This section discusses potential Station-related direct and indirect effects on NRHP-eligible properties (historic properties). Such properties include prehistoric and historic archaeological deposits, and historic-era properties. This section also describes the criteria used to determine effect, the proposed White Pine Energy Station features and their associated area of potential effect (APE), and potential direct and indirect impacts on NRHP-eligible properties resulting from the construction and operation of the Proposed Action and Alternative 1. Final determination of elegibility will be made by SHPO upon receipt and review of cultural resources reports.

4.13.1 Criteria for Determining Effect

For this DEIS, an adverse effect to a cultural resource deemed eligible for inclusion on the NRHP (as determined by the BLM in consultation with the SHPO) would be considered a significant impact under NEPA.

A project results in an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the NRHP. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics [36CFR800.9(a)].

An adverse effect under 36 CFR Section 800.9(b) is one that occurs when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that would qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. All qualifying characteristics need to be considered, even those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP.

Adverse effects may include reasonable foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (36 CFR Section 800.9(b)(1). For example, an adverse effect can result from the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features [36 CFR Section 800.9(b)(2)], or result in isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NRHP. These criteria for determining effect are in accordance with the State Protocol Agreement between the Nevada BLM and the Nevada SHPO, and the Cultural Resources Programmatic Agreement (PA) (contained in Appendix F, *Programmatic Agreement*) that was developed for the proposed Station by LS Power Associates, the BLM Ely Field Office, and the Nevada SHPO.

4.13.2 Station Description

The Proposed Action and Alternative 1 consist of various Station elements (Station components and activities) that may adversely affect, either directly or indirectly, the integrity of historic properties. The following summarizes Proposed Action and Alternative 1 Station elements that may result in adverse direct and indirect effects to cultural resources.

4.13.2.1 Direct Effects

Construction activities associated with the Station would involve the use of heavy equipment and the removal of vegetation and up to several feet of the existing surface. For the Proposed Action, the direct effects APE consists of approximately 1,281 acres for the power plant site, and ROWs for the Duck Creek Substation, 12 miles for waterline piping, construction, and electrical distribution lines and wells, 1.2 miles of new railroad spur connecting the power plant site to the existing NNR ROW, the Thirtymile Substation and 1.0 mile of access road, 1.2 miles of access road to the power plant and Duck Creek Substation, and 2.5 miles of electric transmission line connecting the Duck Creek Substation to the SWIP. For Alternative 1, the direct effects APE consists of 1,330 acres for the power plant site, and ROWs for the Duck Creek Substation, 8 miles for waterline piping, construction, electrical distribution lines and wells, 3.0 miles of new railroad spur connecting the power plant site to the existing NNR ROW, the Thirtymile Substation and 1.0 mile of access road, 0.8 mile of new access road to the power plant and Duck Creek Substation site, and 6.0 miles of overhead transmission line connecting the Duck Creek Substation to the SWIP.

4.13.2.2 Indirect Effects

The following Station components have the potential to result in adverse indirect visual impacts to identified historic resources located within eight miles of the Proposed Action and Alternative 1. These components are the same for the Proposed Action and Alternative 1 and are described in detail in Chapter 2.

- Cooling towers and steam generator stacks
- Power plant
- Electric transmission facilities
- Water supply system
- Rail spur and existing NNR

BMPs would be implemented to reduce visual effects of the power plant, cooling towers, and steam generator stacks. These BMPs are an integral part of the proposed Station that was described in Chapter 2 (see Appendix A, *Best Management Practices,* for a complete list). BMPs of importance to an assessment of indirect effects to historic-era resources also were discussed in Section 4.7, *Visual Resources*, and are listed and can be reviewed in Appendix A under the heading *Visual Resources*. Those BMPs would be implemented to reduce the visual impacts of Station features (for example, power plant and associated facilities, transmission line towers, etc.) on historic-era resources.

4.13.3 Assessment of Direct Impacts

Implementation and operation of the Proposed Action and Alternative 1 would involve numerous constructed elements, all of which would result in some form of ground-disturbing activity and the potential to adversely impact significant archaeological sites. Except for the 500-kV transmission line ROW, a Class III inventory has been conducted within the majority of the footprint for each of the Station components. This inventory resulted in the documentation of eight prehistoric and historic-era resources that have been recommended eligible to the NRHP, pending a determination by the BLM and the Nevada SHPO.

The following discussion summarizes the direct impacts and mitigation for the Proposed Action and Alternative 1, followed by a discussion of the Thirtymile Substation whose construction and operation is common to both alternatives. The description of potential direct impacts on cultural resources concludes with discussions of unanticipated finds and discovery of human remains.

4.13.3.1 Proposed Action

4.13.3.1.1 Impacts

Pending Nevada SHPO review, technical studies (EDAW 2006a), consisting of Class I and Class III inventories, have recommended the Pony Express Trail/Overland Stage route, the route of the Transcontinental Telegraph, and two segments of the NNR as eligible to the NRHP under one or more of the four criteria (A-D). Based upon a lack of features and archaeological constituents, direct impacts woud not adversely impact either the Pony Express Trail/Overland Stage route nor the route of the Transcontinental Telegraph, but would result in adverse direct impacts to a segment of the NNR, which has been recommended as a contributing element to NRHP eligibility of the entire NNR route from Ely to Cobre. The inventories also indicated the potential for additional NRHP-eligible sites to be located within the 500-kV transmission line ROW linking the Duck Creek Substation to the SWIP. This proposed ROW would also bisect the NNR, which may also result in a direct impact.

4.13.3.1.2 Mitigation

Mitigation of historic properties identified during the Class III inventory and additional properties that may be identified during future inventories of the 500-kV transmission line would be handled according to the guidelines outlined in the PA, which would include the development of a Historic Properties Treatment Plan (see Appendix F, *Programmatic Agreement*). According to the PA, all treatment shall be conducted in a manner consistent with the BLM/SHPO Protocol. The BLM, in consultation with the SHPO, shall ensure that WPEA avoids effects to historic properties through Station design, or redesign, relocation of facilities, or by other means in a manner consistent with the BLM/SHPO. When avoidance is not feasible, the BLM, in consultation with SHPO, Indian Tribes, WPEA, and interested persons, shall develop, or ensure that WPEA develops, an appropriate treatment plan designed to lessen or mitigate Station-related effects to historic properties. For properties eligible under criteria (a) through (c) (36CFR 60.4), mitigation, other than data recovery, may be considered in the treatment plan (for example, HABS/HAER recordation, oral history, historic markers, exhibits, interpretive brochures or publications, etc.). Where appropriate, treatment plans shall include provisions (content and number of copies) for a publication intended for dissemination to the general public. When data recovery is required as a condition of approval, the BLM, in consultation with the SHPO, shall develop, or ensure that WPEA develops, a data recovery plan that is consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-37) and *Treatment of Historic Properties: A Handbook* (Advisory Council, 1980).

4.13.3.2 Alternative 1

4.13.3.2.1 Impacts

Four prehistoric and historic-era properties would be adversely affected by the implementation of Alternative 1. These four known resources consist of the two prehistoric archaeological sites, a historic homestead, and a segment of the NNR that has been recommended for NRHP eligibility under Criterion C, based on integrity and association, and under Criterion D, for the presence of archeological deposits that have the potential to provide information on the maintenance and operations of the NNR route from Ely to Cobre. In addition, it is possible that additional archaeological deposits and historic resources may be present and affected by activities within the 500-kV transmission line linking the Duck Creek Substation to the SWIP (EDAW, 2006a). The route will also bisect the NNR at a second point located north of the documented segment mentioned above.

4.13.3.2.2 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.3.1.2.

4.13.3.3 Thirtymile Substation

4.13.3.3.1 Impacts

Three prehistoric sites recommended eligible for listing on the NRHP are located along the access road or within the proposed footprint of the Thirtymile Substation (see Table 3.13-1 in Chapter 3, Section 3.13, *Cultural Resources)*. Direct impacts to these sites in the form of substation construction and road improvements and maintenance would result in adverse impacts to these NRHP-eligible resources. Impacts would most likely occur during construction; however, access road maintenance following construction may also result in impacts. Given these potentials, the following mitigation measures are recommended to reduce or eliminate direct construction and maintenance related impacts to these NRHP-eligible properties under both the Proposed Action and Alternative 1.

4.13.3.3.2 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.3.1.2 (Council, 1980).

4.13.3.4 Unanticipated Finds

4.13.3.4.1 Impacts

While technical studies were designed to locate cultural resources and assess the potential for buried archeological deposits, it is possible that subsurface archaeological deposits may be identified during ground-disturbing activities associated with implementation of the Proposed Action or Alternative 1. In addition, although remote, there is also the possibility that human remains may be discovered during implementation of the Proposed Action or Alternative 1.

4.13.3.4.2 Mitigation

When previously unidentified cultural resources, including human remains, are discovered, the procedures outlined in the PA, Section D (Discovery Situations) will be adhered to. Under the agreement, all Station-related activities will cease within 100 meters of the find, and WPEA or its authorized representative shall notify the BLM authorized officer. The BLM, in coordination with the SHPO, interested persons, and Indian tribes, shall determine if undertaking related activities can proceed or if mitigation is required. If mitigation is required the BLM, in consultation with the SHPO, interested persons, and Indian Tribes, shall notify WPEA of the need for mitigation, and that mitigative actions are implemented. The BLM shall ensure that reports of mitigation efforts for discovery situations are completed in a timely manner and conform to the Department of Interior's Formal Standards for Final Reports of Data Recovery Program (42 FR 5377-79). Activities may resume after the BLM notifies WPEA that the mitigation process is complete.

4.13.4 Assessment of Indirect Visual Impacts

Technical studies were conducted to assess the visual impacts of the various elements of the Proposed Action and Alternative 1, and to determine if those impacts would impair the NRHP eligibility of historic-era resources (that is, the six ranches recommended elegible to the NRHP, two ranches unevaluated for NRHP elegibility, and three linear resources [the Pony Express NHT, the NNR, and the Lincoln Highway]) (EDAW, 2006b). For an additional two ranches (Pescio and Fitzhugh Ranches) a lack of access prevented completion of the NRHP evaluation. For Section 106 both are categorized as unevaluated and are assumed eligible for the purposes of NEPA.

A portion of the study focused on the recommendations of eligibility of the historic-era resources and those elements of integrity that contribute to their significance (see discussion in Section 3.13, Cultural Resources). The Schellbourne, Whiteman Creek and Magnuson Ranches, and dug-out structures at the Kemp Ranch are recommended NRHP-eligible under Criterion A based on their association with historically significant events, and their physical setting, association and feeling that conveys that significance. Therefore, the integrity of these four historic-era properties, and the two unevaluated ranches (Fitzhugh and Pescio), which are assumed to be eligible, could be adversely impacted by implementation of the Proposed Action or Alternative 1.

One structure at the Kemp Ranch and structures at two other ranches (Mattier and Monte Neva) have been recommended NRHP-eligible under Criterion C for their architectural style. The adobe structure at Monte Neva was also recommended eligible under Criterion A, for its association with the Monte Neva Hot Springs Resort, of which only the adobe structure remains. Because indirect visual effects would not alter the association of the adobe structure with the location of the historic resort or those characteristics for which the other structures have been determined eligible to the NRHP, the single structure at the Kemp ranch and those of the Mattier and Monte Neva Ranches were not considered in this assessment.

Of the three linear resources, the NNR and Lincoln Highway have not been formerly evaluated and were assumed NRHP-eligible for the purposes of the technical study. The following discussion summarizes study methods and results.

4.13.4.1 Methods of Assessment

Effects may be qualitative in nature, consisting of aesthetic or obstructive impacts. Regardless of the distance of the Station feature from the historic property, it can change the visual appreciation of a landscape and possibly diminish a property's historic integrity. One or more of the following factors determines adverse aesthetic effects:

- Property's historic significance
- The existing visual features at the project location
- The compatibility of the proposed project as it relates to the mass, scale and proportion, height, shadows, color, aesthetic value, contrast, and open space

Projects can block the historic property from being viewed or block a view seen from the historic property, thereby diminishing the property's integrity. A determination of adverse obstructive effects is dependent upon one or more of the following factors:

- Property's historic significance
- Nature and quality of the view from the historic property
- Extent of obstruction of a historic property

4.13.4.2 Assessing the Intensity of Impact

Based on the criteria listed above, impacts may be defined as very low, low, moderate, or high, as follows:

- **Very Low.** Impact is at the lowest levels of detection-barely perceptible and not measurable.
- **Low.** Impact does not affect the character-defining features or elements of integrity of a NRHP-eligible or listed building, structure, object, or district.
- **Moderate.** For a NRHP-eligible or listed building, structure, object, or district, the impact alters a character-defining feature(s) of the resource, but does not diminish the integrity of the resource to the extent that its NRHP eligibility is jeopardized.
- **High.** For a NRHP-eligible or listed building, structure, or district, the impact alters a character-defining feature(s) of the resource, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed on the NRHP.

4.13.4.3 Significant View Shed

Because of its scale and mass, the Station would be visible to varying degrees over a large area within Steptoe Valley. To provide a method of assessing the potential indirect impacts of the proposed Station, viewshed maps (see Figures 4.7.1 and 4.7.3 in Section 4.7, *Visual Resources*) provided a basis for assessing the height of the various Station elements associated with the Proposed Action and Alternative 1 that would be visible throughout Steptoe Valley.

An analysis of visual impacts was conducted at points up to 10 miles from the Proposed Action and Alternative 1 locations. At a distance beyond 10 miles the mass, height, and contrast would appear so small in relationship to the natural features and elements of Steptoe Valley that any effect to the historic integrity of the resources would be negligible. Therefore, these points beyond 10 miles were not considered in the following discussion.

4.13.4.4 Key Observation Points

To better understand the visual impacts that may compromise the integrity and NRHP eligibility of a historic resource, three visual simulations and key observation points (KOPs) were developed for the Station. While these were not conducted from each of the KOPs assessed for visual impacts (see Section 4.7, *Visual Resources*), they do present a variety of views from various distances that may be used to interpret the view and impact of the proposed Station features on the integrity of historic-era resources. The following text describes each of these KOPs.

4.13.4.4.1 KOP 2: Pony Express Route

Located at the point where the proposed water pipeline crosses County Road 18 (Pony Express NHT) this simulation (see Photo [Simulation 4.7-1]) provides a view to the south from the central portion of Steptoe Valley towards the Proposed Action power plant facility. It is approximately 5.5 miles north of the power plant. Station facilities viewed from this point would consist of the proposed water pipeline ROW and the Proposed Action power plant site.

4.13.4.4.2 KOP 3: Lincoln Highway

This KOP represents views from the historic Lincoln Highway, just north of Magnuson Ranch (see Photo [Simulation 4.7-2]). The Proposed Action power plant would be located approximately 3 miles to the north. From this point the power plant facilities, and the 500-kV transmission line linking the plant to the SWIP would be quite visible. Other constructed features within the vicinity of this location are limited to fencing.

4.13.4.4.3 KOP 4: U.S. 93 Turnoff

This location is approximately 1/2-mile south of Alternative 1 at a turn-out along U.S. 93 (see Photo [Simulation 4.7-3]). Currently, human-made features include some fences and unpaved roads. From this point the Alternative 1 power plant site and facilities, the transmission line along the pipeline corridor, and the 500-kV transmission line linking the power plant to the SWIP would be visible. However, the closest portion of the transmission line would be hidden from view by the power plant facility.

4.13.4.5 Indirect Effects of the Proposed Action

This section discusses the indirect visual effects from the Proposed Action that have the potential to affect or otherwise compromise the integrity of three linear historic resources (Pony Express NHT, Lincoln Highway, NNR) and four historic ranches (Magnuson, Schellbourne, Fitzhugh, and Whiteman).

4.13.4.5.1 Historic Ranches

Of the six ranches, four have been identified within the viewshed of the Proposed Action. Two historic ranches (Pescio and Kemp) are more than 15 miles distant, are not within the viewshed, and were therefore not considered in this discussion. The Magnuson and Schellbourne Ranches are discussed below in Sections 4.13.4.5.2 and 4.13.4.5.3.

Fitzhugh Ranch

A lack of access prevented a full assessment of the indirect impacts to the Fitzhugh Ranch. However, its location within a small side canyon of Steptoe Valley, coupled with the distance from the proposed power plant (6.0 miles), would result in the majority of the power plant features being screened from observation points within the boundaries of the ranch. Only the very tops of the cooling towers and stacks would be visible, and these would be silhouetted against the Egan Range, resulting in low to moderate impacts. Night time lighting would be visible on the horizon to the west, but would be primarily screened from within the ranch boundaries. Because of its topographical location, the integrity of the ranch and its associated structural remains would not be seriously compromised to the point that they affect the NRHP eligibility.

Whiteman Ranch

While a low ridge will partially obscure the plant block (see Photo 4.13-1), and the Proposed Action facilities would be silhouetted against the Egan Range, the proximity of the ranch structures (approximately 3.0 miles) from the Proposed Action features would result in the majority of the features, including the cooling towers and stacks, from being clearly seen and would appear slightly larger than as depicted in KOP 3 (see Photo [Simulation] 4.7-2]. Project lighting would also be clearly visible at night. These indirect effects would result in moderate to high impacts, which would compromise the natural historic setting of the historic structures, thereby compromising the integrity of the historic structures.

4.13.4.5.2 Pony Express National Historic Trail (NHT)

Four points have been identified for the indirect effects assessment to the Pony Express NHT. These are Schellbourne Ranch, the intersection of County Road 18 (Pony Express NHT and Lincoln Highway), a point along County Road 18 directly north of the Proposed Action, and at the intersection of the Pony Express NHT (County Road 18) and Ray Siding, a feature along the NNR. Of importance to this discussion and assessment is the statement by the NPS that lists the Pony Express route from the Nevada-Utah border to a point just east of Austin, including the route within Steptoe Valley, as a high potential route, which affords a high quality recreation experience in a portion of the route having greater than average scenic values.

Schellbourne Ranch

The historic structures located at Schellbourne Ranch reflect multiple historic events, from a stop on the Pony Express and Overland Stage, early mining, early settlement and farming and ranching, and later as a rest stop along the 1913 route of the Lincoln Highway. Two contemporary residences and associated fencing and landscaping have partially impacted the setting and association of the historic site. The view toward the Proposed Action from the historic buildings is currently screened by trees (see Photo 4.13-2). Because it cannot be assumed that the trees would always screen the Proposed Action, another view (see Photo 4.13-3) depicting the view toward the Proposed Action (5.5 miles distant) indicates that the power plant facility would be silhouetted against the Egan Range. From this point the features would be viewed from above, all would be visible, and project lighting would be clearly visible at night. However, the mass and scale of Station features would be smaller than that depicted at KOP2 (see Photo [Simulation] 4.7-1), and when compared to the expanse of Steptoe Valley coupled with the implementation of BMPs, it appears that the impact would be low, and that it would not result in a significant contrast or further detract from the natural setting of the remaining historic structures, the original route of the Lincoln Highway, or the Pony Express NHT.

Intersection of Pony Express NHT and Lincoln Highway

This location is east of Schellbourne Ranch. From this point the facilities of the Proposed Action would be approximately 4.5 miles to the southwest, and would be silhouetted against the Egan Range (see Photo 4.13-4). The view would be similar to that of KOP2 (see Photo [Simulation] 4.7-1). Within view of this location are telephone and power lines and commercial businesses at the intersection of U.S. 93 and County Road 18, approximately 0.5 mile to the west. The cooling towers, power plant block structures, and stacks would be visible, and Station lighting would be clearly visible at night. However, the mass of the facility as seen from this location would be of a small size within Steptoe Valley. It does not appear that the facilities would significantly compromise the setting, association, or feeling of the Pony Express NHT, whose integrity at this location has been compromised by contemporary developments. Considering these factors the impact would be moderate and would not significantly compromise the integrity of the resource.

PHOTO 4.13-1
View Toward Proposed Action with Historic Structure in Foreground (Source EDAW, 2006)

PHOTO 4.13-2
View Toward Proposed Action with Schellbourne Ranch in Foreground (Source EDAW, 2006)

PHOTO 4.13-3
View of Proposed Action (5.5 Miles Distant) from Schellbourne Ranch (Source EDAW, 2006)

PHOTO 4.13-4
View of Proposed Action From County Road 18 (the Intersection of Pony Express NHT and Lincoln Highway) (Source EDAW, 2006)

Intersection of Pony Express NHT and Proposed Pipeline

The Pony Express NHT follows the bladed County Road 18 from east to west across Steptoe Valley, with a commercial development located approximately two miles to the east at the intersection with U.S. 93, and the NNR to the west. Previous investigations (EDAW, 2006a) recommended that this segment, because of subsequent conversion to a bladed and well maintained gravel road, does not meet the requirements for eligibility under Criterion C.

From this point on County Road 18, the stacks, cooling towers, and power block would be silhouetted against the sky and mountains (see Photo 4.13-5 and Photo [Simulation] 4.7-1), and night lighting from the Station would be clearly visible. Considering that the integrity of the route has been compromised by construction of the county road and nearby commercial development, the mass and scale of the Proposed Action would not result in a severe contrast with the natural environment in such a way that it would further compromise the natural setting of the route.

Pony Express NHT at Ray Siding

Except for the NNR, the vicinity of Ray Siding is quite open, with only minimal changes in the surrounding environments since the NNR was constructed 100 years ago. Because the feature is located 6.5 miles from the Proposed Action (see Photo 4.13-11), when viewed from this location the Proposed Action would appear much smaller in size and mass than that depicted for KOP 2 (see Photo [Simulation] 4.7-1), and would be silhouetted against the Schell Creek Range. Stacks and cooling towers would be visible and Station lighting would be visible at night. However, the mass and contrast of the facilities would result in low to moderate impacts. Therefore, it does not appear that the Proposed Action would deter from the nature and quality of the view from this feature along the Pony Express NHT.

4.13.4.5.3 Lincoln Highway

This segment of the Lincoln Highway is listed as a road with landscape vistas (NPS, 2004); however, it has not been formerly evaluated for eligibility to the NRHP. Currently, the route is in an area with limited human development (see Photos 4.13-6 and 4.13.-7), which consists of fences, dirt roads, and a telephone line that parallels the route on the upslope (east) side. South of the Proposed Action the Warm Springs, Twitchell, and Monte Neva Ranches are visible on the west side of Steptoe Valley. While traffic is visible along U.S. 93 for the majority of the route, the highway itself is not in view. The Magnuson Ranch is a prominent feature along the route, and still retains the residence that is mentioned in the 1915 Lincoln Highway tour guide. Because the area has remained virtually unchanged in the last 95 years, the travelway does appear to possess excellent integrity of location, design, setting, feeling, and association. Assessments of the route were conducted, and the visual impacts from north to south are described in the following text.

Intersection with County Road 18

This location is east of Schellbourne Ranch. From this point the facilities of the Proposed Action would be approximately 4.5 miles to the southwest, and would be silhouetted against the Egan Range (see Photo 4.13-4). The view would be similar to that of KOP2 (see Photo [Simulation] 4.7-1). The cooling towers, power plant block structures, and stacks would be visible, and Station lighting would be clearly visible at night. The mass of the facility as seen from this location would be of a small size within Steptoe Valley, resulting in a moderate impact. Therefore, the severity of the impact would not greatly diminish the setting, association, or feeling, or otherwise compromise the NRHP eligibility of the Lincoln Highway.

Point East of Proposed Action

As depicted in Photo 4.13-8 this location along the Lincoln Highway is within a rural environment. The Magnuson Ranch, a rest stop along the original 1913 route, is approximately 4 miles to the south. The point of assessment is approximately 1 mile directly east of the Proposed Action, and would visually appear similar to KOP4 depicted in Photo (Simulation) 4.7-3. From this point all of the Station facilities could be clearly seen, including the 500-kV transmission extending west to the SWIP. Although silhouetted against the Egan Range, the Station's mass and contrast with the existing natural environment would be significant. Therefore, the impacts to the integrity, including, setting, association, and feeling, would be severely compromised, resulting in a high impact that would significantly compromise the eligibility of the resource.

Magnuson Ranch

While subsequent development at the Magnuson Ranch has impacted the integrity of the setting, this has been a relatively low impact. The ranch still retains the setting, feeling, and association of rural landscape associated with the original 1913 Lincoln Highway. This is reflected in the residence that dates to that period, which is recommended as eligible to the NRHP for its association with the Lincoln Highway. From the Magnuson Ranch/Lincoln Highway Rest Area the Proposed Action would be located 3.5 miles to the northwest (see Photo 4.13-9) and would appear similar to that depicted for KOP3 (see Photo [Simulation] 4.7-2). All of the Station facilities would be clearly visible, including the 500-kV line extending west to the SWIP corridor. Station lighting at night would severely detract from the natural setting. The Station's size and mass as viewed from this location would create a distraction from the natural landscape and a moderate to high impact to the association, setting, and feeling associated with the Lincoln Highway.

4.13.4.5.4 Nevada Northern Railroad

Cherry Creek Station

Field investigations at the Cherry Creek Station (see Photo 4.13-10) revealed that the locale has been substantially compromised from the built environment present during the period of significance (for example, during operation of the NNR). The station has been moved to the town of Ely and now serves as the Ely Historical Society Museum. In addition, the water tank and flagging signal have been removed, further compromising the integrity of the Cherry Creek Station. The rural environment of the location appears to have remained unchanged since construction of the NNR in 1906. Except for the town of Cherry Creek, in the distance, no other man-made features are visible from this locale.

At a distance of 10 miles the location of the Proposed Action would be slightly visible on the horizon and would be silhouetted against the Schell Creek Range, with only the stacks and cooling towers visible. Night time Station illumination also would be only slightly visible on the horizon. Therefore, considering the impacts from removal of several key elements of the Cherry Creek station the indirect Station-related visual impacts would be very low and imperceptible.

PHOTO 4.13-5
View South Toward Proposed Action From County Road 18 (Source EDAW, 2006)

PHOTO 4.13-6
Lincoln Highway Facing North – South of the Proposed Action (Source EDAW, 2006)

PHOTO 4.13-7
Lincoln Highway Facing South – North of Alternative 1 (Source EDAW, 2006)

PHOTO 4.13-8
View of Proposed Action Facing West (Source EDAW, 2006)

PHOTO 4.13-9
View of Proposed Action From the North End of Magnuson Ranch (Source EDAW, 2006)

PHOTO 4.13-10
Cherry Creek Station – View of Proposed Action From North of Water Tank (Source EDAW, 2006)

Ray Siding

Ray Siding appears as a single track, and presumably any switches or siding that may have been present were removed prior to cessation of NNR operations (see Photo 4.13-11). Within the vicinity of Ray Siding the rural landscape is quite open, with only minimal changes in the surrounding environment since the NNR was constructed 100 years ago. Because the feature is located 6.5 miles from the Proposed Action, when viewed from this location the Proposed Action would appear much smaller in size and mass than that depicted for KOP2 (see Photo [Simulation] 4.7-1), and would be silhouetted against the Schell Creek Range. Therefore, it does not appear that the Proposed Action would compromise the quality of the setting and association when viewed from this feature, resulting in low impact.

Raiff Siding

Raiff Siding retains all of the features that existed during NNR operations (see Photo 4.13-12). Other than ranches and fencing in the distance, there are no objects of a built environment visible from the siding. Therefore, the siding retains the elements of setting, association, and location. From this location the Proposed Action would be 2 miles to the south, and would appear slightly smaller in mass than that depicted for KOP 4 (see Photo [Simulation] 4.7-3). All of the features of the power plant would be clearly visible, with the stacks and cooling towers extending above the crest of the Schell Creek Range. Nighttime Station illumination also would be clearly visible. The mass and scale of these facilities would create a major contrast with the existing natural environment and setting, thereby compromising the integrity and resulting in a very high indirect impact.

Warm Springs Siding

Warm Springs Siding appears to retain the elements of association and setting in place during NNR operation. The switches and paddles are still in place and operational, and the natural environment has remained almost unchanged since NNR construction in 1906. While the Warm Springs Ranch and Monte Neva Hot Springs Ranch are clearly visible from this location, these features were also present in the early 1900s, during the period of significance. At a distance of 4 miles from the Proposed Action (see Photo 4.13-13), the power block, stacks, and cooling towers would be the most visible facilities from this location, and would be silhouetted against the skyline similar to the simulation depicted by KOP3 (see Photo [Simulation] 4.7-2). In addition, nighttime Station lighting would be quite visible. The Station's height and mass would be in direct contrast with the natural environment, severely compromising the setting, association, and feeling, and resulting in moderate to very high indirect impacts.

Steptoe

The function of this named area along the NNR is uncertain. Currently there are no sidings and the only feature is a small square structure constructed of railroad ties. From a distance of 9.5 miles, the features of the Proposed Action would be visible and would be silhouetted against the sky and Schell Creek Range (see Photo 4.13-14). Station lighting would be visible in the distance at night. The mass of the facility would appear to be much less than that depicted in KOP2 (see Photo [Simulation] 4.7-1). Given the distance, the mass and scale of the facility would result in a minor contrast with the natural surroundings, and therefore would not significantly compromise the integrity of the NNR at this locale.

4.13.4.5.5 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.3.1.2.

4.13.4.6 Indirect Effects of Alternative 1

This section discusses visual effects that may be expected from implementation of Alternative 1. Like the Proposed Action, only those locations that are 10 miles or less from the proposed Station features are discussed. Distances of all points along the Pony Express NHT, including Schellbourne Ranch and the historic Whiteman Ranch are greater than 10 miles and were, therefore, not considered in this discussion.

4.13.4.6.1 Historic Ranches

The four historic ranches (Magnuson, Pescio, Fitzhugh, and Kemp) within the viewshed of Alternative 1 were assessed for indirect effects. Magnuson Ranch is discussed further below in Section 4.13.4.6.2 and the other ranches are discussed immediately below.

Pescio Ranch

This ranch is situated on the east side of Steptoe Valley, north of Cherry Creek Road. Although not directly inspected because of a lack of access, the structures at this ranch are along the southern edge of a ridge that may obscure all but the very tops of the cooling towers and stacks. When viewed from the western ranch boundary (see Photo 4.13-15), the power block and other Station facilities including cooling towers and stacks would be silhouetted against the Egan Range, and at a distance of 5.0 miles would appear similar to that depicted in KOP2 (see Photo [Simulation] 4.7-1). Although visible from this location, the scale and mass of the Station facilities at this distance would be low and would not present a significant contrast to the natural setting and association of the ranch such that the historic integrity and NRHP eligibility would not be compromised

Fitzhugh Ranch

Similar to the Pescio Ranch the historic property and structures of the Fitzhugh Ranch are situated within a side canyon of Steptoe Valley that opens to the west. Alternative 1 would be located approximately 5.0 miles to the southwest with most if not all of the Station facilities obscured by an intervening ridge. While Station night lighting would be visible on the horizon it would not significantly detract from the historic-era setting. Because the impacts would be very low to low, the historic integrity and NRHP eligibility of the ranch would not be compromised.

Kemp Ranch

Three dug-out structures located on this ranch have been recommended eligible under Criterion A, based upon their association with new settlement and ranching development as a response to the copper mining boom of the early 1900s. Because of the limited amount of development that has occurred since construction, these buildings retain the setting, feeling, and association within Steptoe Valley of this early 1900s theme (see Photo 4.13-16). When viewed from the log structures, Alternative 1 features would appear smaller in size and mass than that depicted for KOP2 (see Photo [Simulation] 4.7-10, and would be silhouetted against the Schell Creek Range. The transmission line linking the substation with the SWIP would also be visible on a small scale, and Station night lighting would also be highly visible. Because of the small scale when viewed at this distance in comparison to the vast expanse of Steptoe Valley, the indirect effect would be low to moderate, and would not severely compromise the setting, feeling, and association of the buildings.

PHOTO 4.13-11
View Towards Proposed Action From Ray Siding (Source EDAW, 2006)

PHOTO 4.13-12
Raiff Siding – View toward Proposed Action (Source EDAW, 2006)

PHOTO 4.13-13
View Toward Proposed Action From Warm Springs Siding (Source EDAW, 2006)

PHOTO 4.13-14
View Toward Proposed Action (Source EDAW, 2006)

PHOTO 4.13-15
View Toward Alternative 1 From Western Edge of Ranch Property (Source EDAW, 2006)

PHOTO 4.13-16
View Toward Alternative 1 (Historic structure in lower portion of photograph) (Source EDAW, 2006)

4.13.4.6.2 Lincoln Highway

Currently, development at the southern end of Steptoe Valley is similar to that at the north. It is limited to fencing, a telephone/power line to the east paralleling the highway, and dirt and gravel roads. The area retains the rural setting and association that existed during the early 1900s (see Photo 4.13-17).

Magnuson Ranch

Magnuson Ranch was a rest stop along the Lincoln Highway. The ranch has retained the integrity of setting within Steptoe Valley, association with the Lincoln Highway, and the feeling associated with transcontinental travel in the early 1900s. Alternative 1 facilities, when viewed from this location, would be 6.0 miles away (see Photo 4.13-18) and would be similar to that depicted for KOP1 (see Photo Simulation 4.7-1). Facilities and features would be silhouetted against the Egan Range and Station lighting would be visible at night. While visible from this location, it does not appear that Alternative 1 facilities would detract from the association and feeling of the Magnuson rest stop and the Lincoln Highway at this point, and it does not appear that Station facilities would represent a significant detraction from the natural setting and association. Therefore, the impact would be low and would not significantly compromise the integrity or NRHP eligibility.

Point East of Alternative 1

This point would be approximately 1 mile directly east of the Proposed Action (see Photo 4.13-19), and would visually appear slightly smaller than depicted in KOP4 (see Photo [Simulation] 4.7-3). From this point all of the Station facilities could be clearly seen, including the 500-kV transmission line extending west to the SWIP, and the transmission line along the waterline ROW. Station night lighting would also be clearly visible. At this locale impacts to the integrity, including, setting, association, and feeling would be significantly compromised, resulting in a very high impact.

Intersection with Duck Creek Road

Currently, the view to the west and north in the vicinity of the Lincoln Highway and Duck Creek Road is a rural landscape with fences, U.S. 93, and the paved Duck Creek Road (see Photo 4.13-20). The community of McGill is visible to the south. From this point Alternative 1 facilities would be approximately 5 miles to the northwest. All of the facilities would be visible and would appear silhouetted against the Egan Range to the west, similar to that depicted in KOP2 (see Photo [Simulation] 4.7-1). At this distance, the Station's mass and size would not significantly compromise the visual setting and association of the Lincoln Highway. Similarly, the transmission line along the pipeline ROW would be more than five miles distant and the 500-kV line linking the Duck Creek Substation would extend from 6 to 12 miles from this point. Both of these features would be minimally visible from this location, resulting in low to moderate impacts, which would not compromise the integrity or NRHP eligibility of the route.

4.13.4.6.3 Nevada Northern Railroad

Four features along the southern portion of the NNR are within 10 miles of the Alternative 1 power plant site. Potential indirect impacts to these features are discussed below.

Warm Springs Siding

Warm Springs Siding has retained the integrity of feeling, association, location, and setting from the early 1900s, the period of significance. From this location Alternative 1 facilities would be 5 miles away. Similar to the Proposed Action, these facilities would be silhouetted against the skyline (see Photo 4.13-21), appearing very similar to the simulation depicted in KOP2 (see Photo [Simulation] 4.7-1). Visually, the stacks and cooling towers would be seen: however, because of the terrain and distance, the other features of the facility would not. The 500-kV transmission line, linking the Duck Creek substation to the SWIP, may also be partially visible. Nighttime Station lighting would be clearly seen. While the Station's height and mass would affect the view to the south, it would not present a severe contrast to the existing natural environment such that it created a significant impact to the setting, association, and feeling in the vicinity of Warm Springs Siding.

Corrals

Associated features along the NNR include corrals with a loading chute and an operating windmill. These ranch-related features appear to have been constructed in the 1920s after completion of the NNR; however, they do not appear out of place or in contrast with the surrounding natural environment (see Photo 4.13-22). From this location, the components of Alternative 1 would appear slightly closer than those depicted for KOP3 (see Photo [Simulation] 4.7-2). Although silhouetted against the Schell Creek Range and sky, all associated elements of the power plant and substation would be clearly visible as would the transmission line within the pipeline ROW, and the railroad spur line linking the Duck Creek Substation with the existing NNR. Because of the mass and extent of the facilities when viewed from this location, they would result in a very high indirect impact to setting, association, and feeling of the NNR, compromising the integrity of the feature.

Steptoe

Features associated with the NNR at this location include a small, covered structure constructed of railroad ties. To the north, remnants of a telegraph line paralleling the railroad are visible along the west side of the NNR (see Photo 4.13-23). At a distance of 2.5 miles, the components of the Alternative 1 power plant would be highly visible, similar to but with slightly larger mass than those depicted in KOP3 (see Photo [Simulation] 4.7-2). In addition, the transmission line within the pipeline ROW and the railroad spur extending from the Duck Creek Substation to the railroad spur would also be visible. Silhouetted against the Schell Creek Range and sky the Station constituents would present a major contrast to the existing natural environment and setting, significantly compromising the setting, feeling, and association of the NNR at this location.

Glenn Siding

Glenn Siding has retained its integrity of feeling, association, setting, materials, workmanship, and design. Currently, the view and setting from Glenn Siding is that of open range land to the north (see Photo 4.13-24). The community of McGill, which was in place during the period of significance, is visible to the southeast. From this location, Alternative 1 facilities would be silhouetted against the sky and Schell Creek Range. While the distance to Alternative 1 facilities would be 5 miles, similar to that depicted in KOP2 (see Photo [Simulation] 4.7-1), the terrain slopes upward from Glenn Siding towards the Schell Creek Range. Therefore, all of the components and elements of Alternative 1 would be clearly visible. The transmission line along the pipeline connecting the water wells and the proposed spur connection to the existing NNR would also be visible. Night lighting from the Station would also be clearly seen from this location. Given the size, mass, and contrast of the Alternative 1 facilities, it appears that they would significantly compromise the feeling, setting, and association of Glenn Siding and the NNR at this location, resulting in a very high impact compromising NRHP eligibility.

PHOTO 4.13-17
View of Lincoln Highway Facing South (Alternative 1 would be located in the background to the right) (Source EDAW, 2006)

PHOTO 4.13-18
View of Alternative 1 From Magnuson Ranch (Source EDAW, 2006)

PHOTO 4.13-19
View of Alternative 1 directly west from Lincoln Highway (Source EDAW, 2006)

PHOTO 4.13-20
View of Alternative 1 From Lincoln Highway and Duck Creek Road (Source EDAW, 2006)

PHOTO 4.13-21
View Toward Alternative 1 From Warm Springs Siding (Source EDAW, 2006)

PHOTO 4.13-22
View Toward Alternative 1 From Corrals (Source EDAW, 2006)

PHOTO 4.13-23
View Toward Alternative 1 (Source EDAW, 2006)

PHOTO 4.13-24
Glenn Siding – View toward Alternative 1 site (Source EDAW, 2006)

4.13.4.6.4 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.4.5.4, *Nevada Northern Railroad.*

4.13.5 Connected Actions

4.13.5.1 SWIP

Potential direct and indirect impacts to cultural resources from SWIP construction and operation were assessed (BLM, 1993). Direct impacts could result from physical disturbance or destruction of cultural resources during construction activities such as clearing vegetation, installing tower foundations, assembling and erecting towers, stringing and tensioning conductors, upgrading and constructing access roads, and restoring disturbed areas. It was estimated that for each linear mile of transmission line approximately 1 acre of land would be directly and substantially disturbed at transmission tower sites and work areas, and that another 5 acres might be minimally and temporarily disturbed (for example, crushing vegetation) (BLM, 1993).

Two types of indirect impacts to cultural resources could occur as a result of SWIP construction and operation. First, a general increase in public access to currently remote areas because of new or upgraded access roads could lead to a degradation of cultural resources, either from inadvertent damage because of uncontrolled recreational use or off-road travel, or from intentional vandalism. The second type of indirect impact would be visual intrusions that degrade the settings of cultural resource sites (BLM, 1993).

Several specific sites of potential SWIP-related cultural resources impacts are in the vicinity of proposed White Pine Energy Station feature sites. The first site is Dry Canyon Spring located along the SWIP/proposed White Pine Energy Station transmission line corridor southwest of the White Pine Energy Station Proposed Action power plant site. There is potential for a high direct impact at the Dry Canyon Spring site. The second site is the Pony Express/Lincoln Highway route near the White Pine Energy Station Proposed Action power plant site. There would be visual intrusion of SWIP transmission lines and towers into the site setting (BLM, 1993).

Mitigation potential was considered to be very high for most cultural resources located in the SWIP corridor. The transmission line alignment or tower sites could be shifted to some degree within a corridor to minimize or avoid direct and indirect impacts to cultural resources (BLM, 1993).

4.13.5.2 NNR

Inventory of short NNR segments that articulate with the proposed rail spurs linking to the Proposed Action and Alternative 1 power plant sites indicate that portions of the route appear eligible to the NRHP, and other elements have been designated a National Historic Landmark. However, the majority of the NNR route has not been surveyed for cultural resources. As stated in the Programmatic Agreement (see Appendix F, Page 4), an inventory of historic properties along and the landscape adjacent to the segment of the NNR to be improved within White Pine and Elko Counties shall be conducted. David Evans and Associates, Inc. (2002) recommended that the reach of track extending from north of Ely (milepost 128.4) to Cobre be evaluated for eligibility to the NRHP, and that the Nevada State Historic Preservation Office and BLM be consulted to mitigate any potentially adverse effects resulting from

NNR rehabilitation and reinstatement (David Evans and Associates, Inc., 2002).

4.13.6 No Action Alternative

No Station-related direct or indirect impacts to NRHP-eligible cultural resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.14 Environmental Justice

This section identifies and assesses potential effects of the Proposed Action, Alternative 1, Connected Actions, and the No Action Alternative on environmental justice.

4.14.1 Proposed Action

4.14.1.1 Impacts

Communities and residences more than 1/2-mile away are too far from Proposed Action Station features, including the associated transmission line and water line, to experience most of the potential adverse impacts, such as increased noise, dust, and traffic—except for traffic effects during construction. Those communities separated from Station features by natural barriers, such as the Egan Range, and constructed barriers would experience very little potential impact.

White Pine County conducted an income survey for the community of Cherry Creek in 2005. While the survey indicates more than 51 percent of the population surveyed fall within the definitions of low and moderate income, the community Cherry Creek is outside of the study area based on the natural and man-made barriers that would separate the community from the Station.

Project features, including the transmission line and water line, would affect communities at a distance through the need for increased services, such as water supply or emergency services. Issues of shared revenue payments and job creation could impact the communities as a whole. The Proposed Action power plant would be approximately 34 miles and 22 miles north of the communities of Ely and McGill, respectively. No people would be displaced as a result of implementing the Proposed Action.

Improved access roads associated with the Proposed Action would be located within a sparsely developed area. The access roads would not pass through or be adjacent to any known minority or low-income communities. For this reason, access road improvements would have no effect on minority or low-income communities.

Project features associated with the Proposed Action would be visible throughout Steptoe Valley, which contains approximately 50 percent of White Pine County's population and includes Ely and McGill. Ely and McGill are both more than 0.5 mile from Station feature sites. The 600-foot-tall steam generator stacks and the 550-foot-tall cooling towers at the Proposed Action power plant site would be visible from approximately 32 miles to the south, 4 miles to the west, 30 miles to the north, and 6 miles to the east. Views of the Station features from the closest community, Cherry Creek, located north of the Station site, would be obstructed by the Cherry Creek Range. Based on distance and the existence of natural barriers, there would be no disproportionate effect on minority or low-income communities.

Pollutants of concern generally include PM, nitrogen oxides, sulfur dioxide, and volatile organic compounds. The Nevada Department of Environmental Protection, Bureau of Air Pollution Control, addresses emissions of these pollutants and issues permits based on amount and type of pollutant to be emitted. Section 4.6.1, *Air Quality,* provides a complete description of effects on air quality.

The sparse population within 23 miles to the south of the Proposed Action power plant site and more than 50 miles in other directions precludes the opportunity for disproportionately high, adverse human health or environmental effects regarding air quality on minority or low-income populations.

4.14.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.14.2 Alternative 1

4.14.2.1 Impacts

No disproportionate adverse impacts on minority or low-income populations associated with Station construction and operation or access road, visual, and air quality effects would occur under Alternative 1 for the same reasons as described previously for the Proposed Action. No people would be displaced as a result of implementing Alternative 1. The Alternative 1 power plant would be approximately 22 miles and 11 miles north of Ely and McGill, respectively. The 600-foot tall steam generator stacks and the 550-foot-tall cooling towers at the Alternative 1 power plant site would be visible from approximately 20 miles to the south, 8 miles to the west, 40 miles to the north, and 3 miles to the east. The sparse population within 11 miles to the south of the Alternative 1 power plant site and more than 50 miles in other directions precludes the opportunity for disproportionately high, adverse human health or environmental effects regarding air quality on minority or low-income populations.

4.14.2.2 Mitigation

No mitigation is required for Alternative 1.

4.14.3 Connected Actions

4.14.3.1 SWIP

The SWIP Final EIS did not identify any disproportionately high or adverse impacts to minority or low-income populations that would result from SWIP construction and maintenance (BLM, 1993).

4.14.3.2 NNR

There are no specific low-income or minority populations along the NNR Rail Line that would be adversely affected or displaced by restoration and operation of the NNR. The Environmental Justice evaluation that was prepared by David Evans and Associates, Inc. (2002), in accordance with Executive Order 12898, concluded that the NNR Project would not result in disproportionately high and adverse human health or environmental effects to minority populations or low-income populations.

4.14.4 No Action Alternative

No Station-related impacts on environmental justice would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.15 Native American Religious Concerns

4.15.1 Proposed Action

4.15.1.1 Impacts

No issues or concerns have been raised to date by the various Tribes regarding any religious or traditional cultural property concerns for the Station Proposed Action.

4.15.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.15.2 Alternative 1

4.15.2.1 Impacts

No issues or concerns have been raised to date by the various Tribes regarding any religious or traditional cultural property concerns for Station Alternative 1.

4.15.2.2 Mitigation

No mitigation is required for the Proposed Action.

4.15.3 Connected Actions

4.15.3.1 SWIP

The SWIP Final EIS did not identify any potential impacts on Native American religious concerns. However, there is the potential for disruption to the Moapa Indian Reservation in southern Nevada (see Section 4.17, *Socioeconomics*) (BLM, 1993).

4.15.3.2 NNR

No Native Americans reside along the NNR Rail Line that would be adversely affected or displaced by restoration and operation of the NNR. The NNR would not adversely affect Indian Tribes (David Evans and Associates, Inc., 2002).

4.15.4 No Action Alternative

No Station-related impacts on Native American religious practices or traditional cultural properties would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.16 Paleontological Resources

This section describes the potential impacts of the proposed Station on paleontological resources. For purposes of definition, an adverse impact on paleontological resources would occur if project construction and operation activities would substantially compromise the scientific and educational values of paleontological resources present at that site.

4.16.1 Proposed Action

4.16.1.1 Impacts

Steptoe Valley is on sediments mapped as Quaternary alluvium and playa deposits (see Section 3.2.1, *Geology*, for further discussion). No fossil localities have been recorded in the area except in the general vicinity of the proposed transmission line ROW, and the impact potential on paleontological resources is low. Appendix A, *Best Management Practices,* describes BMPs that would be implemented to minimize or avoid the potential for impacting paleontological resources if discovered during Station construction or operation.

4.16.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.16.2 Alternative 1

4.16.2.1 Impacts

Steptoe Valley is on sediments mapped as Quaternary alluvium and playa deposits. No fossil localities have been recorded in the area except in the general vicinity of the proposed transmission line ROW, and the impact potential on paleontological resources is low. Appendix A, *Best Management Practices,* describes BMPs that would be implemented to minimize or avoid the potential for impacting paleontological resources if discovered during Station construction or operation.

4.16.2.2 Mitigation

No mitigation is required for Alternative 1.

4.16.3 Connected Actions

4.16.3.1 SWIP

Potential impacts from the construction of SWIP transmission line towers and access roads on known unique and potential paleontological resources within geologic formations would be avoided or minimized by avoiding or spanning sensitive paleontological features (BLM, 1993). As a result, potential impacts would be low to not identifiable. No specific areas of paleontologic concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line.

4.16.3.2 NNR

The NNR Environmental Assessment did not specifically address paleontological resources. The impact potential of the NNR on paleontological resources is probably bounded by estimates of impact potential for the SWIP and the proposed White Pine Energy Station, which range from low to not identifiable.

4.16.4 No Action Alternative

No Station-related impacts on paleontological resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.17 Socioeconomics

This section summarizes the potential effects of the White Pine Energy Station Proposed Action and its alternatives on socioeconomic resources, focusing on impacts that would occur in White Pine County. Overall, the development of the Station would result in a range of economic benefits to White Pine County. These benefits include, but are not limited to, local income and job creation, generation of tax revenue, and the development of a reliable and affordable source of power. Also, the Station would help diversify the local economy and support the development of local community infrastructure, resulting in less dependence on the boom-and-bust cycle of the mining industry and leading to an improvement in public services for local residents. Economic benefits would likely also extend outside of the county based on purchases of goods and services during Station construction and operations, as well as power- and railroad-related benefits. These economic benefits would be derived, in part, from putting to beneficial use water rights held by White Pine County (see discussion of Other Indirect Economic Benefits near the end of the Socioeconomics discussion) and the re-establishment of the NNR.

Conversely, the Station would induce mostly short-term population growth into the region, and some long-term population growth, thereby creating additional demand for public services and other community-based infrastructure and resources. The potential beneficial and adverse socioeconomic effects of the proposed Station are described below.

Methodology

To evaluate the potential effects of the Station on socioeconomic resources, both quantitative and qualitative analytical techniques were used. Where quantitative analyses were not warranted or feasible, potential socioeconomic effects were analyzed qualitatively. All quantified monetary values are presented in 2006 dollars. For the analysis of local economic impacts, an input-output analysis using IMPLAN (Impact Analysis for Planning) was used to quantify Station effects on economic output, income, and employment in White Pine County. Economic output refers to the value of goods and services produced in a region. IMPLAN is a computer-driven system of software and data commonly used to perform economic impact analysis. It was originally developed by the USFS to assist in land and resource management planning. The IMPLAN system has been in use since 1979, and is widely used as a tool for applied economic analysis. The system is now maintained and marketed by the Minnesota IMPLAN Group, Inc. IMPLAN estimates total economic effects of the Station based on Station-related spending and production values (direct effects), which generate indirect and induced economic effects from money circulating throughout the economy. These multiplier (or "ripple") effects are based on inter-industry linkages in the study area and household spending patterns. Indirect economic effects refer to changes in output, income, and employment resulting from the iterations of businesses in some industries purchasing from businesses in other industries and initially caused by the direct economic effects. Induced economic effects refer to changes in output, income, and employment caused by the expenditures associated with new household income generated by direct and indirect economic effects. The economic parameters of the Station and related assumptions, including Station-related spending over time, the likely sources of purchased materials, available local labor, power production and other values, were defined with input from WPEA and White Pine County staff, and were used as inputs to the IMPLAN model. For the purposes of the input-output analysis, a 2004 economic model for White Pine County was used to estimate economic impacts, which is based on the latest available IMPLAN dataset. The model was modified to more accurately represent local industry conditions based on the economic parameters related to the proposed Station.

Potential impacts to the fiscal resources of local agencies and related public services were assessed using a number of sources. Estimated tax revenues are based on a separate fiscal analysis (Applied Analysis, 2005) prepared for the Station, which considered the level of economic activity that would be generated by the Station and applicable tax rates and regulations. The distribution of tax revenues was estimated using historic data on revenue distributions and established formulas found in the tax regulations. Available budget and other fiscal data were provided by White Pine County. Potential effects on public services are based on communications with affected agencies via White Pine County staff and those familiar with the services likely to be affected by the construction and operation of the proposed Station. In addition, the actions that WPEA and the County are expected to take to minimize adverse effects on local public services during Station construction and operation were also considered. These actions are referred to as BMPs and are referenced in the related impact sections below, in the Station description (see Chapter 2), and in Appendix A, *Best Management Practices*.

The socioeconomic analysis, including the economic modeling conducted for the Station, assumes the Station would be developed in two phases. The first phase (Phase I) involves the concurrent development of two generating units with a nominal generating capacity of 1,060 MW. The second phase of the Station (Phase II) consists of the development of a third generating unit, which would add another nominal 530 MW of generating capacity for a total of 1,590 MW. For the purposes of this analysis, it is assumed the third unit, if developed, would be constructed subsequently to the first two units. Because of the uncertainty regarding the actual development of the third generating unit, the focus of the narrative is on the first phase of the Station, although the socioeconomic effects associated with the development of the third generating unit are referenced where applicable and included in the data tables.

Lastly, the construction and operation phases of the Station would result in unique socioeconomic effects. Therefore, the impact analysis is organized into construction- and operations-related impacts for each of the resource topics. Impacts are characterized as either positive (beneficial) or negative (adverse), and where possible, they are evaluated relative to regional conditions to help put their magnitude into perspective.

4.17.1 Proposed Action

4.17.1.1 Impacts

4.17.1.1.1 Construction-Related Effects

Population

Development of the proposed Station would require a substantial construction work force. Over the approximate 52-month construction period, it is estimated that the work force would fluctuate between approximately 40 and 50 workers (during Station start-up and completion) and 1,200 workers (during peak construction periods), resulting in an average annual construction work force of about 760 workers (WPEA, 2006). This construction period is for the concurrent development of two generating units. Construction of a third generating unit is expected to last about 44 months if developed independently of the first two units. To the extent that local labor is available, construction workers would likely be hired from the local labor force, primarily workers living in Ely and the surrounding communities of McGill and Ruth. The extent to which local labor would be used to serve the construction needs of the Station is not known at this time and depends on the selection of the prime contractor and their hiring policies. The availability of local workers with appropriate and specialized skills also may be limited because of the number of other large construction projects that are expected to be developed in the general area during the same timeframe as the Station (see Section 4.19.2). For the purposes of this analysis, estimates of the utilization of local construction labor are based on the size of the existing construction work force (approximately 150 employed workers), number of unemployed workers in the county and their qualifications, and assumptions regarding the potential shift in the currently employed construction labor force from existing and yet-to-be-constructed projects to the Station. Discussions with the Nevada Employment Security Department indicate that it is estimated that about 10 workers of the unemployed work force (147 workers) would qualify for Station-related construction jobs (Rajala, 2006). Further, it is assumed that there would be a 20 percent shift in the existing employed construction work force from other projects and jobs to meet the labor needs of the Station. Based on these assumptions, it is estimated that an average of approximately 40 jobs (or about 5 percent of the average annual construction job base serving the Station) would be filled by local residents from White Pine County. Over the life of the Station's construction (approximately 4 to 5 years), up to approximately 300 construction jobs could be filled by local residents, which includes workers already employed by local contractors who may serve as sub-contractors during Station construction. Most of the work force would likely come from areas outside the county (Las Vegas, Reno, Salt Lake City, other parts of rural Nevada, or other areas). Workers drawn to the Station project area from outside the county, as well as some workers from distant areas of the county, may choose to temporarily relocate to the project area during construction. It is anticipated that most of these non-local workers would utilize the proposed temporary housing that would be developed by WPEA on and off the Proposed Action power plant site. These housing facilities would accommodate up to 1,000 workers on the power plant site and an additional 300 workers (and their families) in/near the nearby community of Ely. Assuming full occupancy in the new

Station housing units and an average household size for those workers bringing families, and recognizing the extent of local construction labor that would be utilized, it is estimated that there would be an average short-term population increase in the county of approximately 1,320 people during the approximate 52-month construction period. During peak construction periods, which would last about 10 months. As many as 1,760 people could be drawn to the area on a temporary basis. U.S. Census data show that the average household size in White Pine County is 2.45 people. For the purposes of this analysis, it is conservatively assumed that the average household size for workers bringing families would be higher (3.0 people per household) to account for typically larger household sizes for families.

In summary, the Proposed Action is expected to result in temporary increases in local population levels. This could be particularly evident in Ely where the proposed family housing serving the Station would be located. Specifically, approximately 900 new people may relocate to Ely, an increase of nearly 21 percent relative to its existing population of about 4,300 residents. The magnitude of the temporary population effects at the county level would be relatively smaller (about an 18 percent increase during peak construction periods) based on its larger population base of approximately 9,500 residents. Potentially, some workers, particularly those with specialized skills that are not available in the local labor pool, may decide to move to the area permanently. This effect is expected to be negligible. The potential effects of these temporary increases in local population levels are described in the sub-sections that follow and address related resource topics, primarily housing and public services.

Housing

Based on the potential increase in population in the county resulting from Station construction, the Proposed Action would result in a short-term need for temporary housing to accommodate the construction work force. As described previously, these workers would likely relocate to the Station project area on a temporary basis during construction as opposed to traveling to/from their permanent residences in outlying areas based on the remote nature of the Station site. This pattern is typical in the region because of the cyclical nature of Nevada's predominantly rural economy where much of the construction work force has become fluid, moving from one project site to the next. In other words, many workers travel to various job locations across the state while maintaining a permanent residence at another location.

In anticipation of temporary housing needs during project construction, the Proposed Action includes provisions to provide temporary housing to serve the construction work force. Construction worker housing would include a combination of modular dormitory-style housing and recreational vehicle (RV) facilities on the power plant site, as well as modular apartments and/or homes in or near the communities of Ely or McGill to serve workers relocating with their families. Specifically, up to 20 modular facilities (with a capacity of 800 workers) and RV facilities (with a capacity of 200 additional workers) would be provided onsite and an additional 300 apartments/homes would be established offsite. In total, Station housing would be able to accommodate up to 1,300 workers, which is greater than the estimated peak construction work force of

1,200 workers. Based on the provision of on- and offsite Station housing, the Proposed Action would not generate a substantial demand for other types of temporary housing in the Ely or McGill areas or other parts of the county. This would preclude potential adverse impacts on rental housing (which there is a current shortage of because of the re-opening of the Robinson Mine near Ruth, Nevada) and on available motel and/or RV space. Accordingly, it would also preclude potential adverse impacts on the local tourism industry, which relies on the adequate availability of motel space and other accommodations.

Local Economic Activity

Construction of the proposed Station would require substantial expenditures for capital equipment, construction-related goods and services, and labor. These expenditures would generate local economic activity, as measured by changes in economic output, labor income, and employment, over the approximate 52-month construction period. The estimates of changes in local economic activity generated by the Station, and contained in this section, are based on input-output economic modeling using IMPLAN (see Methodology for more information).

Under the Proposed Action, the total capital investment of Phase I of the Station is estimated at approximately \$1.75 billion. Of that total, construction spending on goods/services and major equipment (including pollution control equipment) accounts for approximately \$1.35 billion; \$350 million is attributed to construction labor payroll. Other costs (primarily composed of "soft costs") represent the remaining \$50 million. Soft costs consist primarily of payments on debt used to finance the Station. The direct value of Station-related construction output in White Pine County, which excludes these other costs, totals \$1.7 billion, or about \$392.3 million annually over the construction timeframe. By definition, the direct value of construction output is attributed entirely to the location of the Station site, in this case, White Pine County.

However, a substantial portion of construction expenditures would be made outside of White Pine County, including spending on specialized equipment that is not manufactured locally (for example, boilers, steam turbines, and pollution control equipment), as well as pipe conduit, wiring, pumps, motors, steel, etc. Based on the construction-related values presented above and using representative data for gas and electric facilities derived from IMPLAN, it is estimated that a total of approximately \$667.1 million in specialized equipment would be purchased from outside the county and installed at the Station site. Because these products are not produced and/or sold locally, no additional *economic* activity directly attributable to these expenditures would be generated in the county. However, ancillary monetary benefits would be realized, such as spending for transportation and construction labor needed to transport and install the equipment, as well as use tax revenues on out-of-state purchases. (Refer to the discussion of potential fiscal impacts below for more information on use tax revenues).

To the extent that construction expenditures are made locally, construction of the proposed Station would generate additional local economic activity, including income and employment benefits in White Pine County. Local expenditures would primarily consist of spending on construction labor and materials such as aggregate/gravel, concrete, electricity, lumber, paint, tools, vehicles, office supplies, lubricants, furnishings, hardware and software, well drilling services, asphalt, etc. Excluding those expenditures on major equipment that are expected to occur outside the county, it is estimated that the Station would generate a total demand for about $682.9 million ($157.6 million annually) in other construction goods and services (excluding labor). However, the existing industries serving the construction sector in White Pine County are limited, and only a portion of local demand would be met by local industries in the county.

In addition to spending on construction-related goods and services, the proposed Station would also generate direct employment and labor income benefits during Station construction. In terms of jobs, construction of the Station would directly support an average of 760 temporary construction jobs over a 52-month period, with peak employment levels at about 1,200 jobs. Based on available construction labor, it is anticipated that about 40 jobs would be filled by local residents of White Pine County (please refer to the analysis of population impacts discussed previously in this section for more information).

Payroll expenditures required to fund the Station's construction labor requirements are estimated to total $350 million over the initial construction period, averaging about $80.8 million annually. Of this annual total, approximately $4.3 million would be earned by construction workers from White Pine County, with the remaining $76.5 million accruing to non-local workers. This represents the direct income effect of Station construction. A portion of construction income would be retained and spent in the local economy resulting in additional economic activity. Labor income earned by local workers is expected to be spent in the county in accordance with typical household spending patterns. Conversely, most of the labor income earned by non-local workers is expected to be transferred out of the county (to the area of primary residence). However, it is assumed that 20 percent of income earned by non-local employees would be spent in the local economy to pay for standard living expenses, such as food and entertainment, while temporarily residing in the county. Overall, it is estimated that approximately $19.6 million of direct labor income from construction would be retained and spent locally annually, which would generate additional economic activity.

Table 4.17-1 summarizes the estimated annual economic impacts of the Proposed Action during the initial construction phase (Phase I) of the Station. The table includes the direct economic effects of construction activities described above, as well as the additional (indirect and induced) economic benefits that would result as money circulates throughout the White Pine County economy.

Based on direct construction spending, employment, and payroll levels, it is estimated that construction of the Station would generate an additional $22.1 million in local economic output for a total output value of $414.4 million per year. In total, about $1.8 billion in economic output would be generated during the initial construction phase of the Station, of which about $95.6 million represents additional economic production beyond the construction value of the Station.

TABLE 4.17-1

Summary of Estimated Annual Economic Output, Income, and Employment Impacts of the Proposed Action (Phase I-Two Generating Units) [a,b,c]

Economic Impact	Direct	Indirect	Induced	Annual Total
Construction				
Output	$392.3 million	$17.2 million	$4.9 million	$414.4 million
Labor Income/Earnings	$80.8 million	$5.9 million	$1.1 million	$87.8 million
Employment (Temporary)	760 jobs	212 jobs	43 jobs	1,015 jobs
Operations				
Output	$315.7 million	$1.9 million	$2.1 million	$319.7 million
Labor Income/Earnings	$10.5 million	$707,000	$457,000	$11.7 million
Employment (Permanent)	135 jobs	27 jobs	19 jobs	180 jobs

Source: ENTRIX, 2006

[a] Numbers in the table represent annual average values. Monetary values are in 2006 dollars.

[b] Direct effects are based on information provided by White Pine Energy Associates. Indirect and induced effects are based on estimates derived from IMPLAN.

[c] Economic effects listed in the table are for White Pine County only.

More pertinent to local economic conditions are the income and employment benefits that would be generated by the Station. Construction of the Station under the Proposed Action is estimated to generate approximately 255 jobs in the county in addition to the average annual employment requirements at the Station site (760 jobs). In total, the estimated employment benefits attributed to the initial construction phase of the Station under the Proposed Action is 1,015 jobs annually. This is equal to 23 percent of the existing job base in the county. Of this total, employment of local workers could reach nearly 300 jobs (40 direct construction jobs plus 255 additional jobs), which accounts for almost 7 percent of the local labor force in White Pine County.

Overall, employment generated by construction of the Station would be a major and temporary economic benefit of the Proposed Action. Further, to the extent that these construction jobs are filled utilizing locally unemployed residents, the local unemployment rate could temporarily decrease. Because most construction workers are expected to be drawn from areas with a substantially larger employment base, there would likely be a negligible effect on unemployment rates in areas outside White Pine County.

Potential increases in employment during construction would also have a positive effect on the earnings/income of construction workers serving the Station. The direct income effect from construction of the Station is estimated at $80.8 million annually, and the additional income generated as a result of Station construction is estimated to be $7.0 million per year. Total labor income benefits generated by Station construction are estimated at $87.8 million annually, which accounts for about 55 percent and 34 percent of existing wage earnings and personal income levels in the county, respectively. Over the entire construction period, total labor income generated by the Station is expected to reach about $380.4 million. The income benefits generated by Station construction would be a short-term and positive economic impact of the Proposed Action.

Economic Impacts Associated with a Third Generating Unit (Phase II)

A summary of the economic benefits attributed to the construction of a third generating unit is presented in Table 4.17-2. Generally, subsequent construction of additional generating capacity at the power plant would prolong the economic benefits of Station construction by an additional 44 months. On an average annual basis, the magnitude of economic benefits under Phase II of the Station would be smaller relative to Phase I. Specifically, the direct economic effects of Phase II construction are estimated to be $231.8 million in economic output, $47.7 million in labor income, and 502 jobs. These direct effects, in turn, would generate additional economic benefits for a total of $245.0 million in output, $51.9 million in labor income, and 655 jobs annually over the 44-month construction period.

Tax Receipts and Fiscal Resources

White Pine County, as well as the State of Nevada and its other counties, would experience fiscal benefits during construction of the Station. Fiscal benefits during construction would be attributed to sales and use taxes (including out-of-state purchases of equipment and materials), ad valorem (property) taxes, and business taxes. Another potential source of additional tax revenue is the Motor Fuels Tax. Revenue from this tax would be generated by construction-related fuel consumption (although as noted below, this tax is not expected to be a major source of revenue for White Pine County).

TABLE 4.17-2

Summary of Estimated Annual Economic Output, Income, and Employment Impacts of the Proposed Action (Phase II-Third Generating Unit) [a,b,c]

Economic Impact	Direct	Indirect	Induced	Annual Total
Construction [d]				
Output	$231.8 million	$10.1 million	$3.1 million	$245.0 million
Labor income/earnings	$47.7 million	$3.5 million	$701,300	$51.9 million
Employment (temporary)	502 jobs	125 jobs	27 Jobs	655 jobs
Operations [e]				
Output	$157.9 million	$773,400	$608,000	$159.2 million
Labor income/earnings	$3.0 million	$282,900	$134,300	$3.4 million
Employment (permanent)	40 jobs	11 jobs	6 jobs	56 jobs

Source: ENTRIX, 2006
[a] Numbers in the table represent annual average values. Monetary values are in 2006 dollars.
[b] Direct effects are based on information provided by White Pine Energy Associates. Indirect and induced effects are based on estimates derived from IMPLAN.
[c] Economic effects listed in the table are for White Pine County only.
[d] Construction effects in Phase II would occur after Phase I of the Station is complete.
[e] Operations effects represent the incremental increase in economic effects from development of Phase II of the Station, and are in addition to the effects listed for Phase I.

A separate estimate of direct fiscal revenues generated during Station construction (and operations) was prepared for the Station by Applied Analysis (Applied Analysis, 2005). This fiscal analysis does not include revenue from the Motor Fuels Tax, and does not address the indirect fiscal impacts associated with indirect or induced economic activity that would be generated by the proposed Station. This analysis was based on a proprietary model and a number of assumptions, which correspond closely to the parameters of Phase I of the Station (the scenario where two generating units are developed concurrently). The following assumptions were made in the fiscal analysis prepared by Applied Analysis:

- The Station would have a generation capacity of 1,000 MW with a total capital investment of $1.6 billion over a 5-year period.
- Construction employment would average 800 jobs, with a peak of 1,200 jobs.
- Permanent employment payroll would be $1 to $3 million per year.
- Annual coal purchases subject to sales and use tax would be $33 million per year. The fiscal analysis assumes that coal used to fuel the proposed power plant would be subject to use taxes. A court case is currently pending that is examining the applicability of use taxes to such items.
- There would be no change in ad valorem tax rates. White Pine County would continue to maintain the maximum allowed rate.
- No tax abatements or other economic incentives would be provided to WPEA other than the exemption for pollution control equipment that is currently available. It should be noted that that the State does offer incentive programs; however, to date, an application has not been made to the State Commission of Economic Development to request the incentives.

The results of the Phase I fiscal analysis have been extrapolated to provide a rough approximation of fiscal impacts under Phase II of the Station (the scenario where a third generating unit is developed subsequent to the first two units). The Phase I and II fiscal analysis results are summarized in the tables presented and described below.

The results of the Phase I fiscal analysis indicate that the Station would generate an estimated $129.4 million in total tax revenues during the 5-year construction period (see Table 4.17-3). Total tax revenues consist of $77.3 million in sales and use taxes, $27.7 in real property taxes, $22.9 million in personal property taxes, and $1.4 million in modified business taxes. On an annual basis, tax revenues are estimated to average $25.9 million per year during the 5-year construction period.

TABLE 4.17-3

Summary of Estimated Tax Revenues Generated Under the Proposed Action (Phase I-Two Generating Units) [a,b,c]

Construction	2007	2008	2009	2010	2011	Total
Modified business tax	$105,625	$359,125	$430,950	$392,925	$147,875	$1,436,500
Ad valorem property tax – real	$1,087,721	$3,403,679	$5,990,509	$8,208,276	$9,031,050	$27,721,235
Ad valorem property tax – personal	$809,182	$2,774,339	$5,317,482	$6,762,450	$7,224,840	$22,888,293
Retail sales and use tax	$10,687,500	$19,593,750	$23,868,750	$15,318,750	$7,837,500	$77,306,250
Total	**$12,690,028**	**$26,130,893**	**$35,607,691**	**$30,682,401**	**$24,241,265**	**$129,352,278**
Operations	**2012**	**2013**	**2014**	**2015**	**2016**	**Annual Average**
Modified business tax	$40,138	$40,138	$40,138	$40,138	$40,138	$40,138
Ad valorem property tax – real	$8,960,595	$8,826,090	$8,826,090	$8,557,080	$8,422,575	$8,718,486
Ad valorem property tax – personal	$6,882,630	$6,245,926	$5,694,118	$5,209,083	$4,773,813	$5,761,114
Retail sales and use tax	$2,351,250	$2,351,250	$2,351,250	$2,351,250	$2,351,250	$2,351,250
Total	**$18,234,613**	**$17,463,404**	**$16,911,596**	**$16,157,551**	**$15,587,776**	**$16,870,988**

Source: Applied Analysis, 2005

[a] Monetary values are in 2006 dollars.

[b] Values represent direct fiscal impacts. Indirect and induced fiscal effects have not been estimated.

[c] Motor Fuels tax revenue and franchise fees are not included in the fiscal analysis.

Sales and use tax revenues are expected to be the largest source of tax revenues generated by the Station, averaging about $15.6 million per year over the construction period. This type of tax revenue is collected by the State of Nevada, which, in turn, distributes a portion of the money back to local jurisdictions based on established formulas. Based on historic distributions, it is estimated that annual sales/use tax revenues generated by Station construction would be distributed as follows: White Pine County (including White Pine County School District) (approximately $10.3 million), State of Nevada (about $4.4 million), and other Nevada counties (approximately $733,000). In total, sales tax revenues realized by White Pine County during Phase I construction are estimated at $51.6 million. These tax revenues would be a major fiscal benefit to state and local government agencies, particularly those in White Pine County. To ensure that sales and use tax revenues are collected in a timely and appropriate manner, White Pine County and the Nevada Department of Taxaton would work with WPEA to develop policies and procedures for reporting and payment of sales and use taxes generated during project construction.

Station construction also would generate sales tax benefits from construction worker spending in the local economy. The extent of such benefits depends on how much labor income is retained in the county and the proportion of local spending on taxable goods and services. Although not quantified, these indirect sales tax revenues would be another positive fiscal impact of Station construction.

Property tax benefits would be realized by White Pine County and its local agencies/districts, as well the State of Nevada. It is estimated that of the approximate $50.6 million in property tax revenues generated by the Station, approximately $23.1 million would go directly to White Pine County (excluding local agencies/districts) and about $2.4 million would go to the state.

As indicated above, potential Motor Fuels Tax benefits have not been quantified for the proposed Station. Gasoline tax revenues are very difficult to quantify because of a range of statutory provisions that govern their applicability. For example, the following provisions apply to the Motor Fuels Tax in White Pine County: (1) it applies to gasoline but not diesel fuel; (2) fuel used by vehicles that are not registered and are used off road (on the construction site for example) is not taxed; (3) Motor Fuels Tax on vehicles that are registered out-of-state is distributed on a nation-wide formula rather than the state formula; and (4) fuel purchased for a centralized distribution point on the construction site is taxed on the wholesale price at the point of delivery, and if the contractors set up a central tank for construction vehicles, they can submit a claim to be reimbursed for the fuel used by unregistered off road vehicles. Discussions with the Nevada Department of Taxation indicate that gasoline tax revenues generated by the Station and realized by White Pine County would likely be minimal (Rajala, 2007).

Fiscal Impacts Associated with a Third Generating Unit (Phase II)

Based on estimates of construction spending for the third generating unit, which is expected to be approximately 50 percent of projected spending under Phase I, related fiscal impacts are expected to also be approximately half of the fiscal impacts presented for the two-generating unit scenario (see Table 4.17-4). This includes approximately $38.7 million in total sales and use taxes, $13.9 million in real property taxes, $11.4 million in personal property taxes, and $718,000 in modified business taxes. Although limited, additional gasoline tax revenue would also be generated during the construction of a third generating unit. In total, and excluding the limited gas tax revenues, the revenues generated during construction of Phase I and II of the Station are estimated to be over $194 million over an approximate 9-year construction period.

Property Values

The potential effect of the Station on local property values and related tax revenues is addressed below in Section 4.17.1.1.2, *Operations-Related Effects*.

TABLE 4.17-4

Summary of Estimated Tax Revenues Generated Under the Proposed Action (Phase II-Third Generating Unit) [a,b,c,d]

Construction	2012	2013	2014	2015		Total
Modified business tax	$70,463	$256,591	$256,591	$134,604		$718,250
Ad valorem property tax – real	$1,359,788	$4,951,640	$4,951,640	$2,597,549		$13,860,618
Ad valorem property tax – personal	$1,122,721	$4,088,367	$4,088,367	$2,144,690		$11,444,147
Retail sales and use tax	$3,792,042	$13,808,647	$13,808,647	$7,243,789		$38,653,125
Total	**$6,345,014**	**$23,105,246**	**$23,105,246**	**$12,120,633**		**$64,676,139**
Operations [e]	**2016**	**2017**	**2018**	**2019**	**2020**	**Annual Average**
Modified business tax	$20,069	$20,069	$20,069	$20,069	$20,069	$20,069
Ad valorem property tax – real	$4,480,298	$4,413,045	$4,413,045	$4,278,540	$4,211,288	$4,359,243
Ad valorem property tax – personal	$3,441,315	$3,122,963	$2,847,059	$2,604,542	$2,386,907	$2,880,557
Retail sales and use tax	$1,175,625	$1,175,625	$1,175,625	$1,175,625	$1,175,625	$1,175,625
Total	**$9,117,307**	**$8,731,702**	**$8,455,798**	**$8,078,776**	**$7,793,888**	**$8,435,494**

Source: ENTRIX, 2006

[a] Fiscal impacts are based on fiscal study prepared for Phase I (two generating units), and are based on the proportion of construction spending that would occur under Phase II (third generating unit).

[b] Monetary values are in 2006 dollars.

[c] Values represent direct fiscal impacts. Indirect fiscal effects have not been estimated.

[d] Motor Fuels taxes and franchise fees are not included in the fiscal analysis.

[e] Operations-related fiscal impacts shown in the table are incremental to the impacts presented for Phase I.

Community Infrastructure and Public Services

This section addresses potential impacts to public services in White Pine County. These types of potential effects are a concern given the County's relatively precarious financial condition (see Section 3.17.5) and the need for the County to provide some services before the new tax revenue stream estimated in the previous section begins. While the fiscal benefits of the Station would be substantial and would likely help fund a variety of public services in the county in addition to those needed by the Station and its construction work force, there would be an initial delay between the start of construction and when the revenue would become available to the County. The length of delay would vary based on the type of tax and is determined by the length of time it would take to go through the tax reporting and collection process, and because tax revenues are collected by the State of Nevada, the length of time it takes until these revenues are re-distributed to

White Pine County from the state. Generally, and based on discussions with the Nevada Department of Taxation, tax revenues generated by the Station's construction would be realized by White Pine County within 6 to 18 months after assessment and reporting (Rajala, 2007).

Since the new tax revenue stream is expected to eventually be more than sufficient to cover the costs of public services needed by the Station over the long-term, this section focuses on those local services that could be affected during the Station's construction phase and prior to when the new revenue stream associated with the Station would begin.

Law Enforcement

Based on the Station's relatively large construction work force and the County's previous experiences with crime increases during previous large construction projects (see Section 3.17.7.1), the Proposed Action would likely result in an increase in demand for traffic control and law enforcement services in the Station project area during construction. The increased demand for law enforcement services may strain police protection services in White Pine County, and preliminary discussions with the Sheriff's Department indicate that an additional one to two deputies and one patrol car would be needed to serve the Proposed Action power plant (Romero, 2005). The costs associated with adding these resources would ultimately be covered by the increased tax revenue generated by the Station. However, until this tax revenue stream is established, WPEA has agreed to provide funding for these additional resources such that there would be no interim service deficiencies. Other security-related BMPs have been included as part of the Station, consisting of an onsite security office to provide space and facilities for security personnel, a guardhouse for security personnel at the entrance to the power plant site, security fencing around the power plant site, and security vehicles to patrol the site. Speed limit and caution signs would be placed near construction sites and access routes. Traffic control personnel would also be employed at road crossings and construction access ingress and egress sites and would also help minimize the potential increase in demand for sheriff patrols and reduce the need for issuing speeding tickets.

Another type of law enforcement-related impact would be a likely increase in jail inmates during Station construction. Up to 1,200 workers and their families would live in the Station project area during the construction period and would thus increase the likelihood of arrests requiring the use of the County's jail facility or juvenile detention services, both of which have capacity limitations under existing conditions. While it is difficult to estimate related increases in the inmate or juvenile detention populations, the County has experienced such population increases in the past as discussed in Section 3.17.7.1. Therefore, WPEA has agreed to monitor this situation with the Sheriff's Department, and if necessary, would place a temporary building next to the jail to increase jail capacity, or would help the County expand its existing permanent facility, until a long-term solution can be implemented by the County at a later date. Such facilities would be developed in accordance with all applicable standards and regulations governing jail facilities. Given the large amount of tax revenue to be generated by the Station, some of the new revenue from the Station may be used to help fund long-term expansions and/or improvements to the existing jail and juvenile detention facilities.

Fire Protection and Other Emergency Services

Construction activities, in conjunction with the potential increase in the number of people temporarily residing in the Station project area during construction, may increase the need for emergency services in the project area, such as fire protection and emergency medical aid. An increase in demand for such services could result from accidents that could possibly occur with the use of heavy equipment, construction vehicles, toxic chemicals, or other hazardous materials. Also, approximately up to 25 percent of the peak construction work force (300 out of 1,200 workers) would commute to the Station site from the new housing units developed in or near Ely by WPEA (as opposed to living onsite) and thus could be involved in traffic accidents en route to the Station site.

The proposed Station would be served primarily by volunteer fire departments in the County, including emergency medical technicians (EMTs). The closest emergency services to the Station site are in McGill, approximately 22 miles south of the Proposed action power plant site. According to White Pine County, an important issue facing these outlying volunteer departments is covering emergencies during the day when most of their volunteers are at their regular places of employment during daytime business hours (Rajala, 2005). Because construction activities would occur during the time that most volunteers are at work, providing fire protection and emergency services to the Station may strain existing services levels in White Pine County or cause delays in response times until Station-related tax revenue can fund any necessary service upgrades (additional staff and/or equipment).

To address this issue, WPEA has agreed to have up to four permanent employees of WPEA that are trained in EMT and fire-fighting procedures on the site and available to serve as first responders during the Station's construction phase. Further, WPEA would coordinate these efforts with the White Pine Ambulance Service ensuring that all applicable licensing requirements are met and that onsite emergency response efforts are integrated with local emergency medical services, including transport of victims to local medical facilities. WPEA staff trained in EMT procedures would likely be supported by similar personnel that work for the contractor firms hired by WPEA to help construct the Station. At least one emergency ambulance/paramedic vehicle would also be supplied on the Station site by either WPEA or its contractors to expedite response and transport times as well as assist with treatment of patients while being transported to the hospital. WPEA would also make available within the power plant site an onsite helicopter pad, thus facilitating the use of helicopters during emergencies.

The Station's BMPs also include a number of measures that would effectively support first responders if they have to fight fires before fire-fighting personnel from McGill or Ely arrive, including extra water storage, backup diesel generators and pumps, water trucks, and other equipment.

Other Medical Aid

If necessary, serious medical emergencies occurring at the Station site or related to the construction work force temporarily residing in the Station project area would be directed to the William Bee Ririe Hospital in Ely, which provides emergency room services. Based on plans for hospital expansion and existing capacity levels, hospital capacity is not anticipated to be an issue, and no additional hospital beds and/or medical staff are expected to be required to serve Station workers or their families.

Education and Schools

The majority of construction workers are likely to come from outside White Pine County and would move into the Station project area temporarily. Most of these workers are not expected to bring their families with them or would be single without families, and would thus likely live in the 1,000 unit, onsite and temporary, housing facility that would be provided by WPEA. Married workers and workers with children would likely live in the temporary housing units that would be developed in or adjacent to Ely. WPEA has committed to building up to 300 of these family units. Using a range of census data for the county regarding people per household and children as a percentage of the population, a worst-case analysis approach leads to an estimate of 115 to 144 school age children potentially residing in the temporary family housing units. While 2000 census data for White Pine County indicate an average of 2.45 people per household, the county has a relatively high retirement population (WPCEDC 2006). (According to the 2000 Census, in White Pine County, persons 60 years and older account for 18 percent of the population, compared to 14 percent for Nevada as a whole and 15.2 percent for the United States., The percentage of the County's population that was 60 years and older in 2000 is higher than it was in 1990.) Also, because most of the workers are expected to come from areas outside of the county and families tend to have more people living in their households, a higher figure of 3.0 people per household was used to develop a range of the total number of people that may live in the 300 family housing units (735 to 900 people). County statistics on the average number of school age children as a percentage of the total population (15.67 percent) (Rajala, 2006) were then applied to this estimate to come up with an estimated range of school age children (115 to 144).

Based on the available data regarding school capacity summarized in Section 3.17.7.4, sufficient capacity is expected to be available in the White Pine County School District to accommodate this potential increase in enrollment.

Social Services

The relatively large number of jobs that would need to be filled by WPEA and its contractors to construct the Station would attract a number of workers seeking new employment in the county. Some of these people may be unemployed or may need assistance from the county's social services organizations. While an increase in demand for county social services can be expected, this increase would be temporary, the number of people needing assistance would likely not be large, and the county Social Services Department and other existing organizations described in Section 3.17.7.6 are expected to be able to help most, if not all, of these people (Hill, 2006). Nevertheless, and as discussed in Section 4.17.1.2, White Pine County and WPEA would monitor and mitigate social service and other types of socioeconomic impacts during project construction if warranted.

The county has very few homeless people that stay for extended periods of time, possibly because of very cold temperatures much of the year. Most of the unemployed that come to town looking for work are transients who typically leave town and seek opportunities elsewhere if they are unsuccessful securing employment locally (Rajala, 2006). Also, some of the increase in demand for temporary housing for those who need assistance while looking for other work locally, or before they leave the area, could be met with the new temporary housing that would be developed by WPEA.

In addition, the Proposed Action would have a minor affect on the ability of local motels to provide emergency shelter to the local residents as part of the county's existing motel voucher program. The demand for motel space generated by the Station would be minimal because construction workers would be required to utilize the onsite project housing.

Solid Waste Disposal

Construction of the Proposed Action power plant would generate solid waste (for example, wood and metal construction debris, household waste from onsite housing, etc.) that would require disposal. Until an onsite waste disposal facility is developed by WPEA, which is expected to take 1 or 2 years to construct, all solid waste generated during project construction would be hauled to the City of Ely Landfill for disposal. The City of Ely Engineer's office estimates that approximately 300,000 cubic yards of capacity is available at the landfill for construction waste (Rajala, 2006). In addition, the landfill has approximately 35 years of capacity for household waste (Rajala, 2007). If local landfill capacity becomes constrained during construction because of the disposal needs of the Station and other large construction projects in the area, it has been confirmed that the City of Elko Landfill has available capacity for construction and household waste and is licensed as a solid waste importer (Dotson, 2007). Once the onsite landfill facility is operating, it would be large enough to handle all of the solid waste generated by the Station's construction process. The Station would generate revenue for the City of Ely from disposal fees at the landfill and in the long-term, the new tax revenue generated by the Station could be a major source of funding for any necessary expansions at the landfill.

Road Maintenance

The single county road that would be used to transport gravel to the construction site could experience a relatively fast rate of wear and tear (compared to No Action Alternative conditions) as large gravel trucks would need to travel this route for as many as 96 months (assuming the third unit of the power plant is built after construction of the first two units is completed). However, gravel roads require less maintenance than paved roads and future tax revenues generated by the Station should be sufficient to maintain this road (Rajala, 2006). These tax revenues would be from motor fuel taxes on construction-related gasoline purchases, as well as other project-generated tax revenues deposited into the County General Fund. (There is also pending legislation that may authorize the use of sales tax revenues for road improvements.) Lastly, White Pine County and WPEA would monitor the condition of the County road affected by the Station and work together to develop and implement appropriate mitigate if needed.

Water and Wastewater

Water required to construct the Station would come from the proposed water supply system developed as part of the Proposed Action. The system would ultimately consist of eight ground water wells and an underground water pipeline system. It is anticipated that until the distribution system is developed, water would be trucked to the Station site for construction activities, including dust control. The Proposed Action well field is expected to provide sufficient water to support construction activities, and no existing water utilities would be affected.

Generation of wastewater during construction would be from human and industrial sources. An onsite wastewater treatment plant would be constructed to serve the wastewater treatment needs in the immediate vicinity of the Station. Until that time, portable toilets would be placed at the Station site and along linear facilities during construction and used to contain human wastewater. Waste in the toilets would be collected by the local companies that already service such facilities, treated at the City of Ely Waste Water Treatment Plant (WWTP), and disposed of at the Ely Landfill. Based on the temporary nature of this impact and low volume of waste generated, the Station is not expected to exceed local treatment capacity (Day, 2007). If capacity does become an issue at the Ely facility, the City of Elko WWTP has the capacity to accept the waste from the septic services' companies providing portable toilets during construction (Sawyer, 2007).

In addition, industrial wastewater and storm water runoff generated by Station facilities that is collected after coming into contact with potential pollution sources would be discharged to an onsite evaporation pond in accordance with applicable federal and state regulations.

Power

Power during Station construction, including electric service to the wells, would be supplied by the local electric provider, Mount Wheeler Power Cooperative. Mount Wheeler would also provide electrical service to construction workers residing in the temporary housing to be developed by WPEA. This electrical cooperative has adequate capacity to meet these needs, and the Station is not expected to affect its ability to adequately serve its other customers (Rajala, 2006).

Out-of-County Economic Effects

Construction of the Station would also result in notable economic benefits outside of White Pine County. These benefits are driven primarily by expenditures for large equipment and other goods and services that are not produced locally. Items that would likely be imported from out of the county include major equipment such as boilers, steam turbines, and pollution-control equipment, as well as standard construction materials (for example, pipe conduit, wiring, pumps, motors, and steel). It is estimated that approximately \$667 million worth of major equipment would be imported to serve the Station over the initial 52-month construction period, with an additional \$334 million in major equipment purchased from outside the county if a third generating unit is developed. These expenditures are in addition to the purchase of other construction goods and materials that cannot be provided by local industries. These out-of-county construction expenditures would result in direct and indirect economic benefits (income and employment) in the economies where these items are produced. In addition, to the extent that local labor is not available and/or specialized labor is needed, workers could be drawn in from surrounding counties, including Clark County or Salt Lake City, which have relatively large and diverse construction work forces. This would result in employment benefits and generate wage earnings that are spent primarily outside the county. Finally, fiscal benefits would be realized by those jurisdictions where this out-of-county spending occurs.

Another potential economic benefit to other Nevada counties is an increase in tax revenues resulting from White Pine County no longer being a "guaranteed" tax county. Currently, the county earns a guaranteed amount of tax revenue based on its past fiscal hardship. The tax revenue benefits generated by the Station would likely change the county's status from a guaranteed tax importer to a tax export county, which would allow more tax revenues to be distributed to other Nevada counties.

4.17.1.1.2 Operations-Related Effects

Population

The size of the work force needed to operate the first two generating units is expected to be approximately 135 full- and part-time staff. It is assumed that approximately half of the workers would be hired from the labor pool in White Pine County, while the remaining positions would need to be filled by workers with specialized skills not available locally. New employees involved in Station operation that are not existing county residents would be expected to relocate to the county with their families. Based on the estimated proportion of employees that would need to relocate and the average household size in the county, there could be a long-term increase in the local population of about 165 people, a 1.8 percent increase relative to existing conditions. If a third-generating unit is developed under Phase II, an additional 40 permanent employees would be required at the power plant, and the total population increase is estimated to be 214 new people in the county. The potential effects on related resources, and associated with this long-term increase in population, are addressed below.

Housing

To the extent that new workers elect to move into the local area from outside the county or from other areas within the county, the Station's operational phase would result in a minor increase in demand for permanent housing. Based on existing vacancy rates and ongoing efforts by the County to facilitate the development of new housing in the county, including up to 170 new housing units in the Ely/Ruth/McGill area over the next two years, existing and anticipated future housing resources in the county would likely be sufficient to meet demand. Additionally, new housing may be constructed and financed by the salaries of these new employees during Station operation, some of whom may be able to afford to build their own homes on undeveloped lots.

Local Economic Activity

Operation of the Proposed Action power plant would result in long-term economic benefits to the local economy of White Pine County. The direct economic benefits of power plant operations consist of the value of power generated by the plant (this includes the value of the Station's power sales and is referred to by economists as the direct output effect) and operations-related work force requirements and related payroll (direct employment and labor income effects, respectively). These direct effects, in turn, generate additional economic activity (indirect and induced effects) based on local expenditures that are required for the power plant to operate and local spending of income earned by the operations work force and other local workers.

Based on the maximum capacity of the power plant if only the first two generating units are built (1,060 MW), and assuming an operational load factor of 85 percent, the proposed Station would generate approximately 7.9 million MWh of electricity annually, with an estimated wholesale market value of approximately $315.7 million per year. This estimated value of the power produced represents the direct output effect of the Station. It is based on representative current wholesale market values for electricity in the southwestern United States, which serves as a proxy for the value of power that would be generated at the plant. For purposes of this analysis, the wholesale value of electricity in the regions served by the Proposed Action power plant is estimated at $40/MWh and is based on data in the California Independent System Operator's (ISO) 2005 "Annual Report on Market Issues and Performance," and related spot market and power exchange data provided by California ISO staff. Representative market values were used because the proposed power plant would be a private merchant facility and contract agreements and projected revenue data are proprietary.

Power plant operations would require local expenditures for goods and services, which would generate additional economic activity in the county. Operational expenditures (excluding labor and fuel costs) are estimated to be approximately $25 million annually, a portion of which would be spent locally (as estimated by IMPLAN). This value includes expenditures for items such as lime, ammonia, water treatment additives, electricity, fuel oil, lubricants, office supplies, janitorial services, landscaping services, asphalt, vehicles, rail cars, etc. This figure does not include the cost of coal that would be used to fuel the power plant (about $36.5 million annually in 2004 dollars) and related coal shipping costs (about $49.5 million annually in 2004 dollars). Because the coal would be imported from out of state (the Powder River Basin in Wyoming), coal purchases and shipping costs would not affect local economic conditions. These out-of-county effects are discussed separately below.

In terms of employment and payroll, power plant operations would require 135 full- and part-time staff, which represents the direct employment effect of operations. The annual payroll associated with the operations work force is estimated at $10.5 million annually.

Similar to construction-related effects, operations-related expenditures and labor income would generate additional economic benefits in White Pine County beyond the direct effects described above. A summary of operations-related economic effects, as measured by changes in output, earnings/income and employment, is presented in Table 4.17-1 above.

The total value of economic output generated in White Pine County as a result of power plant operations is estimated at $319.7 million annually. This includes the direct value of power production ($315.7 million), as well as an additional $4.0 million in output that is generated from local operational expenditures and local spending of labor income.

As for employment effects, in addition to the operations work force at the power plant (135 employees), it is estimated that the Station would generate an additional 45 jobs annually in the county during operations. Total employment generated by Station operations (about 180 jobs) accounts for approximately 4 percent of the county's employment base and labor force, and could potentially lower existing unemployment rates. Overall, these employment effects represent a positive and long-term economic benefit for White Pine County.

Operation of the Proposed Action power plant would also have a positive long-term effect on income levels in White Pine County. The total income generated by Station operations is estimated at $11.7 million annually, which consists of direct income effects ($10.5 million in operations payroll) and indirect and induced income effects totaling $1.2 million annually. Total labor income that would be generated by the Station represents about 7 percent of wage earnings and almost 5 percent of total personal income generated in the county under existing conditions.

The operations-related economic benefits described in this section would continue to be generated through the life of the Station (expected to be 40 years or longer).

Economic Effects Associated with a Third Generating Unit (Phase II)

If a third generating unit were developed at the power plant site, the operations-related economic benefits of the Station would increase. Table 4.17-2 shows the incremental increase in economic benefits with the construction of a third generating unit under Phase II of the Station. The incremental economic benefits resulting from Phase II of the Station, if developed, include $157.9 in direct annual economic output, $3.0 million in direct annual labor income, and 40 additional jobs at the power plant. Considering the additional (indirect and induced) economic benefits generated by these direct effects, Phase II of the Station would result in an incremental increase of $159.2 million in total output, $3.4 million in total labor income, and 56 jobs on an annual basis during Station operation.

Tax Receipts and Fiscal Resources

Similar to construction, operation of the Proposed Action power plant would generate sales/use, property (real and personal), and business tax revenues, which represent major long-term fiscal benefits that would be realized at the local and state level (see Table 4.17-3). Based on the fiscal study prepared by Applied Analysis, it is estimated that an average of $16.9 million per year in total tax revenues would be generated during Station operations. The fiscal study evaluated fiscal effects over the first 5 years of Station operations. The largest source of tax revenues during operations are property taxes ($14.5 million annually), followed by sales/use taxes ($2.4 million annually) and business taxes ($40,000 annually).

Property taxes generated during Station operations would provide a fiscal benefit to White Pine County and the state. Because the Station would generate electricity that is sold outside of White Pine County, Station facilities would be centrally assessed by the Centrally Assessed Properties Section of the State Department of Taxation, which is responsible for the valuation, assessment, collection, and distribution of ad valorem taxes related to property of an interstate or inter-county nature (NRS 361.320). Recent legislation (NRS 361.320 (4)) provides that all property taxes generated by a facility such as the proposed power plant remain in the county of origin and not be proportioned out over the system using the unitary system of value. However, the state would still collect 17 mils of the assessed value. Based on estimated revenues and historic distributions of property tax revenues, White Pine County, excluding the local school district and special districts, would receive approximately $6.6 million in property tax revenues annually, and the state would receive about $673,000 per year, during the initial construction period.

A minor increase in property tax revenues would result from the transfer of public lands into private ownership upon purchase of the power plant site from BLM. These property tax effects would depend on the appraised value of the land and changes in PILT payments received by the County, and are considered negligible in the context of the other type of potential property tax revenues described above.

Taxable sales would be generated from expenditures during Station operations. White Pine County would collect sales and use tax on all taxable real property purchased and delivered to the Station site, including coal. Sales/use taxes generated by Station operations would result in an estimated $1.6 million in revenues to White Pine County, $671,000 to the State of Nevada, and $112,000 to other Nevada counties annually.

Fiscal Effects Associated with a Third Generating Unit (Phase II)

The fiscal impacts of the Station under the scenario where a third generating unit is built are presented in Table 4.17-4. It is estimated the average incremental fiscal effect of the third unit includes an additional $7.2 million in property tax revenues, $1.2 million in sales/use tax revenues, and $20,000 in business tax revenues annually. These benefits would be realized at the county and state level.

Property Values

Local property values could be affected by the construction and long-term operations of the proposed Station. In fact, since the Station has been proposed, properties near the Station site (which are currently undeveloped for the most part and used for some cattle grazing) have been rising in value as speculators are hoping additional economic development will take place in the area near the Station (According to the County Assessor, property values in Steptoe Valley have increased at a greater rate than the rest of the county and roughly doubled from 2005 to 2006; Bishop. 2007).

Overall, and from a county-wide perspective, the positive employment and income effects associated with the Station, and its potential for helping to improve public services, recreational amenities and other important elements affecting the quality of life in White Pine County (by providing important new tax revenues), are expected to cause positive property value effects and should outweigh any negative effects on nearby properties that may experience adverse air quality, noise, or visual effects. Therefore, the Proposed Action is expected to have an overall positive effect on property values and the additional tax revenues and community amenities the Station would make possible would benefit all county residents. Increasing land values in Steptoe Valley would also provide a favorable market for those who elect to sell their property near the proposed site.

Some individual property owners who own property near the Station site may experience negative effects. There could be some isolated and negative effects on properties where air quality, noise, or visual effects take place, or where those residing near the Station experience other changes in their quality of life.

The different types of property value effects that could be associated with the

Proposed Action are described in more detail below.

The effect that different industrial facilities have on property values has been researched in numerous economic studies. The primary technique used to evaluate these effects is the hedonic property-pricing method, which uses statistical techniques to isolate the effects of a range of distinct housing characteristics on a property's value. A summary and review of such studies has been conducted and presented in *A Survey of House Price Hedonic Studies of the Impact of Environmental Externalities* (Boyle and Kiel, 2001). Several studies included in this article specifically evaluated the effect that power plants have on property values. For example, Blomquist (1974) concluded that distance to a power plant (up to 11,500 feet, or approximately 2 miles) has a positive and statistically significant effect on property values (the price increases with distance from the plant, all else being constant). Clark and Nieves (1994) conducted a large empirical study that found that property values are lower in areas that have a greater density of "noxious" facilities, which included power plants that emit pollutants and cause adverse noise and visual impacts. Generally, the results of studies that focused on the effect that industrial land uses have on property values showed a statistically significant relationship that implies these types of facilities adversely affect property values for properties directly affected by air, noise, and/or visual impacts. However, the magnitude of these effects varies substantially and some individual property owners owning property near the proposed Station may not feel that the county-wide positive impacts outweigh the negative impacts they perceive for their property and their way of life. They may attribute values to their property other than dollar values. Thus, increasing land values may not resolve concerns they have over changes in nearby land uses that become more industrial in nature, or if they experience new and adverse visual, air quality or noise impacts at their property. They may place a high value on their specific piece of property because of family history, the investment they made for their retirement years, or because of the peace and quiet and pristine surroundings they experienced when they originally purchased the property.

The construction of the Proposed Action power plant could positively affect local property values by creating approximately 135 to 175 permanent jobs in the local area during its operational phase, and thus increasing the long-term demand for housing in the county. While some of these jobs would be filled by local residents who already live in the county, some workers from other areas could be expected to be drawn to the region as these jobs are filled. To the extent that employees permanently move into the area, the demand for local housing would increase, tending to increase local housing prices, particularly if there is no change in supply.

The proposed Station would generate a substantial amount of new tax revenue that would be available to local government agencies to improve community infrastructure, including schools, crime control, libraries, parks and recreational opportunities, social services, and other public services. Improvements to these services would likely result in an improvement in the quality of life for local residents. This would make the county's local communities a more desirable place to live and could draw people to the region, resulting in higher property values.

Community Infrastructure and Public Services

This section addresses potential direct and operations-related effects on community infrastructure and public services, including impacts on law enforcement, emergency services and medical aid, education and schools, solid waste disposal, and public utilities (water, wastewater, and power). Potential indirect effects on community infrastructure and public services are covered in the "Other Indirect Economic Benefits" section below.

Direct effects on community infrastructure and public services would primarily be caused by the potential long-term increase in population attributed to the Station and associated with the creation of permanent employment opportunities. The estimated operations work force is expected to be 135 to 175 staff, which is estimated to result in a permanent population increase in the county of up to approximately 165 to 215 people, which is only about 2 percent of the county's existing population. As a result, adverse effects on community infrastructure and public services from the Station-related population increase are expected to be minimal during Station operations. Other aspects of the Station's operation, aside from population increases, could potentially affect community infrastructure and public services. These effects are discussed in the following text.

Law Enforcement

Although the number of sheriff patrols of the power plant site during operation would be less than those needed during the construction phase, patrols during operations would likely be needed, especially given concerns regarding utility infrastructure as terrorist targets, potential vandalism, stealing of equipment, etc. However, public law enforcement services would be funded by project-generated tax revenues, and private security officers, fencing, a guard station, alarms and other security measures would be employed at the site by WPEA, thus likely reducing the need for assistance from the Sheriff's Department.

Fire Protection and Other Emergency Services

Operation of the proposed Station involves public safety risks that are inherent to all major power plants and industrial facilities. However, the Station would incorporate a wide range of safety features to minimize the risk of injury that would require medical attention. For example, public access to the power plant site would be restricted through the use of fencing and security gates, and the power plant would be equipped with numerous fire suppression systems and industry-recognized BMPs would be implemented to minimize fire and safety risks. In addition, by the time the power plant starts operating, any necessary increase in fire or emergency services would be funded by the new tax revenue generated by the Station.

Water and Wastewater

Operation of the proposed power plant would also generate a demand for water and wastewater treatment. Water supplies that would be used for power plant operations and potable water needs would come from the Station's proposed water supply system. No public water supplies are available in the Station project area. Industrial wastewater and storm water runoff generated by project facilities and collected after coming into contact with potential pollution sources would be discharged to an evaporation pond in accordance with applicable federal and state regulations. Domestic wastewater would be treated at the Station site with onsite septic systems. Therefore, public water and wastewater service providers would not be affected.

Solid Waste

The different types of solid waste that would be generated during the project's operational phase are described in Section 2.2.3.1.3. An onsite solid waste disposal facility would be constructed and operated to dispose of the coal combustion byproducts and the other types of wastes described in Section 2.2.3.1.3. All other types of waste generated by the Station (for example, office wastes, oil, liquids, etc.) would be hauled to the City of Ely's offsite landfill facility, which should have sufficient capacity to handle waste that is not treated at the onsite facility. If the Ely facility does not have sufficient capacity, waste from the Station can be sent to the Elko facility as described in the sub-section above regarding waste disposal during construction.

Out-of-County Economic Effects

Operation of the Proposed Action would generate notable and positive economic effects outside of White Pine County. These effects include: (1) economic benefits (jobs and income) in areas where coal is extracted and purchased for use at the power plant; (2) benefits related to the purchase of goods/services from outside the local area; (3) benefits attributed to regional rail operations; (4) benefits associated with renewable energy development in eastern Nevada counties; and (5) power reliability- and cost-related benefits in areas where White Pine Energy Station power is used. Also, long-term tax benefits to other Nevada counties would extend from the construction phase to the operational phase if White Pine County is no longer a guaranteed tax county and instead becomes a tax revenue exporter.

Coal used to fuel the proposed power plant would come from the Powder River Basin in Wyoming. Approximately 4.5 to 6.8 million tons of coal would be needed to fuel the power plant annually (depending on the number of generating units built) at a cost of approximately $36.5 to 54.7 million per year. Expenditures made to purchase the coal that fuels the plant would support mining-related employment and income in the Powder River Basin area of Wyoming. An additional $49.5 to 74.3 million would be spent annually to ship the coal from its origin to the Proposed Action power plant site. This money would support jobs and generate income for the railroad companies serving the plant, which may include Union Pacific, Burlington Northern Santa Fe, or the Nevada Northern Railroad.

Some goods and services required to operate the proposed power plant, other than coal, would be purchased locally in White Pine County. However, most operating expenses would require expenditures outside the county resulting in out-of-county economic benefits. Operational expenditures for goods and services not available in White Pine County would likely occur in surrounding counties with a relatively more diversified economy (for example, Clark County). However, it is plausible that the local economy would adapt quickly, with new businesses established to meet the needs of the Station, thereby capturing a much larger share of operational expenditures and related economic benefits that would otherwise by enjoyed by out-of-county businesses.

Economic benefits would also be realized outside White Pine County because of expanded railroad operations. By improving the regional rail network to serve the Station, other regions would be able to supply White Pine County and utilize the improved transportation infrastructure, thereby resulting in employment opportunities (and related income benefits) in the transportation sector, as well as potential expansion of industries utilizing rail services. These regional economic benefits would be realized mainly in surrounding counties, such as Elko County, including the cities of Elko and Wells.

Another out-of-county benefit is the possible expansion of renewable energy projects throughout eastern Nevada, including Eureka, Elko, and Lincoln counties. Such expansion would be attributed to the development of required infrastructure under the Proposed Action and connected actions, especially transmission capacity, which would help to encourage smaller, renewable energy projects that could not physically support or afford the transmission capacity on their own. This would also help support the state's goals of increasing the use and development of the technology to support renewable energy options. The State of Nevada has an aggressive renewable energy portfolio standard that requires the state's utilities to rely on renewable power sources for 25 percent of their generation over the long-term. This is indicative of the state's desire to further develop its ample biomass (including the use of pinyon-juniper as a fuel source), wind, and other renewable power sources. Such projects can increase local employment and income opportunities, and generate additional tax revenue for local government. The BLM's Ely District, NDOW and others are also planning on thinning much of the dense, pinyon-juniper trees found in eastern Nevada to improve sage-grouse, elk and other wildlife habitat, reduce fire risks, and improve local economic opportunities. An important piece of the puzzle for achieving these goals is facilitating the development of biomass energy projects that can use the pinyon-juniper as a fuel source, and the enhanced transmission capacity associated with the Proposed Action and its connected actions would be needed by future biomass projects.

Finally, the electrical power produced by the Station would generate economic benefits to the region and state. The Station is expected to generate nearly 7.9 to 11.8 million MWh of power annually, which would be used to serve the State of Nevada (via the Falcon-to-Gonder and SWIP transmission systems) as well as surrounding states in the west. By providing more power to the market, power rates would potentially decrease if demand remains relatively constant. Furthermore, the proposed Station is expected to be operated as a "base load" plant (in contrast to more expensive power plants that operate less frequently, for example, just during peak power usage periods), and coal as a fuel source is less expensive than such other traditional power plant fuels as oil, natural gas, and uranium. Additional power supplies on the market from the Station combined with a low-cost fuel source and its baseload operating mode should result in lower operating costs for the utilities and businesses that use Station power, which in turn, enhances profit margins, improves the efficiency of the regional economy where the businesses are located, and has positive effects on income, jobs, and agency tax revenues. In addition, lower power rates have a positive effect on disposable incomes of residential customers, thus allowing people to spend more money in the local economy, which stimulates economic activity.

The Proposed Action power plant would also provide important power benefits related to what are collectively referred to as "ancillary benefits." Ancillary benefits include voltage support and greater system stability for those portions of the western U.S.'s transmission system that would be connected to Station-related transmission lines. Improvements in system stability in turn result in less frequent and shorter power outages, thus helping avoid reductions in business output and related adverse income and employment effects.

Other Indirect Economic Benefits

Construction and operation of the Station would help White Pine County realize some other economic benefits that are less tangible than the other economic effects described in this section, but nevertheless, important to the local economy.

The first type of indirect benefits would be associated with planned railway improvements to the NNR. These upgrades are necessary to allow the delivery of coal to the Proposed Action power plant site and could lead to other benefits as well. In addition to improvements directly paid for by WPEA, a local redevelopment agency may be created to help fund the rehabilitation costs of the railroad. These improvements may extend beyond the segment to be used by WPEA and approximately 20 percent of the property tax revenues from the Station may be used by this redevelopment agency. This money would be invested locally for the railroad infrastructure and could attract new business to White Pine County, including the City of Ely, and provide additional rail access for a variety of materials needed for new commercial and industrial developments in the county, or expansion of existing industrial activities or mining operations. The improved rail system may also be used to help boost rail-related tourism.

Another type of indirect benefits would be associated with putting the water needed by the Station to beneficial use locally, as opposed to exporting the water outside the county for beneficial uses elsewhere. There is great concern in the counties north of Las Vegas, primarily White Pine and Lincoln Counties, that the Southern Nevada Water Authority (SNWA) will eventually try to export more ground water from these counties to help meet the fast-growing water demands of the Las Vegas metropolitan area. While SNWA has not filed for the rights to water underlying Steptoe Valley where the Station would be located, it has filed for the rights to appropriate ground water from Spring and Snake Valleys, which are east and south of Steptoe Valley. By using the ground water of Steptoe Valley for in-county economic development purposes, the many direct and indirect employment, income, and tax revenue benefits associated with the use of local water resources can be realized locally as opposed to being exported out of the county.

As described in the potential property value impacts section above, another type of indirect benefit from enhanced tax revenues are the many positive community and social benefits that occur when community infrastructure and public services improve once the additional revenue is available.

4.17.1.2 Mitigation

BMPs (see Appendix A, *Best Management Practices*) and the other measures and commitments described in this section would minimize adverse socioeconomic effects. These BMPs and other measures and commitments were designed to address all of the major socioeconomic issues associated with the Proposed Action. Therefore, socioeconomic mitigation is not proposed at this time. In addition, White Pine County would work closely with WPEA to monitor socioeconomic impacts during the Station's construction and operation phases. If the socioeconomic effects are of a greater magnitude than currently expected and problematic, appropriate mitigaton would be developed and implemented by the County and WPEA as warranted.

4.17.2 Alternative 1

4.17.2.1 Impacts

Development of the White Pine Energy Station under Alternative 1 would entail approximately the same level of capital and operating expenditures, labor force requirements, and power generation as the Proposed Action. Because the proposed transmission line route would be shorter under Alternative 1, there would be slightly lower construction-related expenditures compared to the Proposed Action, However, this difference is expected to have a negligible effect on socioeconomic conditions. Therefore, the values reported in the summary tables (Tables 4.17-1, 4.17-2, 4.17-3, and 4.17-4) also apply to Alternative 1. The primary difference between Alternative 1 and the Proposed Action is the physical location of the Station. Under Alternative 1, the Station would be located approximately 10 miles south relative to the Proposed Action, closer to the communities of McGill and Ely. This location could lead to minor benefits related to response times for law enforcement and emergency services. With that exception, Alternative 1 is expected to result in the same type and magnitude of socioeconomic impacts as described above under the Proposed Action.

4.17.2.2 Mitigation

Alternative 1 is expected to result in the same types (and nearly identical levels) of impacts as described for the Proposed Action. The BMPs and other measures and commitments described in Section 4.17.1.2 and provided in Appendix A, *Best Management Practices*, would apply. As described in Section 4.17.1.2, WPEA and White Pine County would also monitor socioeconomic effects during the Station's construction and operation and mitigate such effects if warranted. Therefore, mitigation is not required at this time.

4.17.3 Connected Actions

4.17.3.1 SWIP

4.17.3.1.1 Construction Impacts

The analysis of SWIP construction impacts considered the size and staging of the construction effort, the nearness and size of communities along the transmission line route, and available accommodations (BLM, 1993). A minimum of 105 workers would begin construction of the SWIP at one end of the route, with another group of workers possibly beginning construction at the opposite end of the route. Fenced construction yards would be spaced every 20 to 30 miles. Construction would occur over 3 years. About 60 percent of the workers would be unskilled laborers hired locally and the remainder would be skilled laborers from other areas. About half the workers would require temporary accommodations near the construction site. Temporary accommodations were anticipated to be adequate to house workers, except in Elko where there was a housing shortage (at the time of analysis in the early 1990s) because of mining activity. Local communities would benefit from purchases by construction workers, but benefits would be minimal because the work force would be small and moving from one worksite to the next (BLM, 1993).

4.17.3.1.2 Social and Economic Impacts

The effects of transmission lines on social structures and economic activities are generally relatively small (BLM, 1993). Construction effects are typically minimal because of the small, short-term work force and their mobile nature. Potential adverse effects may include conflicts with tourist activities, such as space for lodging (motels, parks, trailers, and campgrounds) and increased traffic from construction workers and equipment. Mitigation for such conflicts includes scheduling construction to avoid tourist areas during holidays, establishing worker camps, and busing workers. Principal areas of tourist-related concern in the vicinity of the SWIP project in Nevada are Humboldt National Forest and Great Basin National Park. Additional social and economic concerns in Nevada include potential disruptions to residences, agricultural properties, the Moapa Indian Reservation, gravel pits or quarries, a school, and two airstrip clear zones. New land rights would be required for the transmission line and transmission line access roads. Use of federal lands would require ROW grants, while use of private lands would be via easement or purchase (BLM, 1993).

4.17.3.1.3 Fiscal Impacts

Annual property tax revenues during the first year of SWIP operation were estimated for the States of Idaho and Nevada and for each of the counties the transmission line would pass through (BLM, 1993). Estimated revenue (in 1992 dollars) during the first year of SWIP operation would be over $1 million for Idaho and over $2.2 million for Nevada.

4.17.3.2 NNR

4.17.3.2.1 Demographics and Population

Reinstatement of operations on the NNR is expected to indirectly benefit the demographics and population of the City of Ely, White Pine County, and Elko County. Economic diversification and increased employment opportunities associated with NNR operations could lead to long-term, sustained growth in the region (David Evans and Associates, Inc., 2002).

4.17.3.2.2 Employment and Income

Restoration and operation of the NNR rail freight service is expected to result in direct and indirect short-term and long-term employment opportunities and income for skilled and unskilled laborers. CRS and MSC (2005) anticipate that NNR rehabilitation between mileposts 18.5 and 115 would take one or two construction seasons, occurring primarily during the dry months (May through November). Construction crew size usually ranges from 6 to 12 men. Three or four crews of this size would be able to complete the work in one construction season while one or two crews of this size may require two construction seasons (CRS and MSC, 2005). Expanding the excursion tourist train operation would result in increased tourism activities and generate additional income. These effects would economically benefit the City of Ely, White Pine County, and Elko County (David Evans and Associates, Inc., 2002).

4.17.3.2.3 Community Infrastructure

No NNR-related impacts on community infrastructure are anticipated. Infrastructure-related activities would be limited to reconstruction and improvement of NNR road and highway crossings and replacement or possibly addition of NNR culverts to facilitate storm drainage (David Evans and Associates, Inc., 2002; CRS and MSC, 2005).

4.17.3.2.4 Public Services

Reinstatement of NNR operations would potentially cause a slight increase in the demand for fire protection, law enforcement, and emergency services in the area because of more people in the vicinity. No major demands for medical services are anticipated. No direct impact on school services is anticipated because residential growth is not expected to generate a substantial increase in the student population (David Evans and Associates, Inc., 2002).

4.17.4 No Action Alternative

No Station-related socioeconomic effects would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.18 Transportation

This analysis addresses the potential temporary traffic impacts from Station construction activities, and the potential traffic impacts from Station operation.

4.18.1 Proposed Action

4.18.1.1 Impacts

Construction of the Station Proposed Action Scenario 1 as described in Chapter 2 (constructing Units 1 and 2 simultaneously, and constructing Unit 3 at a later date) would last approximately 52 to 55 months (see Section 2.2.4.2, *Construction Schedule and Workforce,* and Table 2-2. As such, constructing Units 1 and 2 would result in a 52- to 55-month temporary direct increase in average daily traffic (ADT) on highways that are considered potential access routes to the Proposed Action power plant site. Constructing Unit 3 would result in an approximate 44-month temporary direct increase in ADT on those same highways at a later date. Normal construction hours are expected to be from 6:00 a.m. to 6:00 p.m. on weekdays. Some activities may require weekend construction. Nighttime construction may be necessary to meet the overall Station schedule.

The construction workforce for the two construction durations would range from a low of 20 workers to a peak of 1,200 workers, with the average number of construction workers expected to be 760 to construct Units 1 and 2, and approximately 500 to construct Unit 3. The peak construction force would work for approximately 10 months of the 52- to 55-month construction period for Units 1 and 2. For Unit 3, the peak construction force would work for approximately 3 months.

Housing and dining facilities for 1,000 Station construction workers would be provided at the power plant site. As a conservative worst-case scenario, for this analysis, it is assumed that, of the 1,200 construction workers who would be working at the Station during the peak construction period, up to 200 workers would commute on Tuesday, Wednesday, and Thursday to the worksite during the peak construction period, resulting in 200 trips arriving at the power plant site by 6:00 a.m., and 200 trips leaving the power plant site at 6:00 p.m. on those days (assuming that each worker drove alone to and from the power plant site). As indicated in Section 3.18, *Transportation*, the potential source towns and cities in Nevada and Utah for construction workers include Elko, McGill, Wells, West Wendover, Wendover, Salt Lake City, Ely, Eureka, Austin, Pioche, and Las Vegas. It is likely, however, that the majority of construction workers would originate from Ely, Elko and Wendover (Leegard, 2007). The increase of 200 vehicle trips would result in a Level of Service (LOS) A for all highways and freeways being evaluated (I-15 and I-80, and U.S. 6, U.S. 50, U.S. 93, and SR 318) (Leegard, 2007), resulting in no impact on LOS. LOS A represents a free flow of traffic with low volumes and high speed (see Table 3.18-2).

Also as a worst-case scenario, it is assumed that all 1,200 workers could leave the Proposed Action power plant site on Fridays at 6:00 p.m. to travel to such towns and cities in Nevada and Utah as Elko, McGill, Wells, West Wendover, Wendover, Salt Lake City, Ely, Eureka, Austin, Pioche, and Las Vegas. Then all 1,200 workers would return to the power plant site on Mondays by 6:00 a.m. This scenario would result in 1,200 trips on Friday evenings after 6:00 p.m. and

1,200 trips on Monday mornings before 6:00 a.m. added to the existing condition ADT. This increase of 1,200 vehicle trips would result in a LOS A for I-15 and I-80, and LOS C for U.S. 6, U.S. 50, U.S. 93, and SR 318 (Leegard pers. comm., 2007). LOS C indicates a stable flow zone of traffic, but most drivers are restricted in the freedom to select their own speeds (see Table 3.18-2).

Construction workers are expected to start their work day at 6:00 a.m. The 200 construction workers who are expected to commute daily to the power plant site may live in local motels, apartments, or RV parks and/or campgrounds. Their commute to the power plant site would occur before 6:00 a.m. For most of the highways in the area, the morning peak hour traffic is expected to occur between 6:00 a.m. and 7:00 a.m. Construction worker traffic would have already subsided by the time the morning peak hour traffic starts. Similarly, construction workers would end their work day at 6:00 p.m., which is at the end of the p.m. peak hour (5:00 p.m. to 6:00 p.m.) for highway traffic. Therefore, no impact on the local peak hour traffic is expected.

If construction workers are required to work at night, the additional traffic would increase the ADT on the highways; however, with lower local and through traffic on the highways at night than day, the impact on traffic flow and LOS would be less than if it occurred during peak hours.

In addition to construction workforce traffic, traffic would also be generated by deliveries of equipment. However, once equipment is delivered to the Station project area, no effect on traffic would occur until the equipment is removed. These infrequent deliveries would not result in an impact on local highway traffic. Deliveries of materials and concrete would also generate traffic, and would average 10 deliveries per day over the 52 to 55-month construction period. This would result in approximately 20 daily vehicle trips (10 trips accessing the Station project area and 10 trips leaving the Station project area). This increase in traffic would not adversely impact existing highway traffic, but could result in a potential public safety impact to children traveling to and/or from school (see discussion below).

Classes at the elementary and secondary (middle and high) schools in the White Pine County School District begin daily between 8:00 a.m. and 8:30 a.m., with children arriving at school beginning at 7:45 a.m. Classes at school end between 2:30 p.m. and 3:15 p.m. (Farnworth, 2007). Bus service to schools in the district typically runs between 7:00 a.m. and 8:30 a.m. and between 2:00 p.m. and 5:00 p.m.; this bus schedule accommodates both regular school hours and the after-school tutor programs (White Pine County School District, 2007; Walker, 2007). In addition, high school children are allowed to leave campus at lunch time (approximately 11:20 a.m. to 12:30 p.m.), children leave school at noon on Wednesdays to allow for teachers' continuing education (known as Professional Learning Communities), and Lund Elementary School has a 4-day school week (school is closed on Fridays) (McIntosh, 2007). As indicated above, construction workers would not be commuting at the time when children are traveling to or from school, so no public safety impact from construction worker traffic is expected. It is possible, however, that the 20 daily trips to deliver materials and concrete to the project site could occur during the times when children are traveling to and/or from school, resulting in a potential public safety risk to those children because of increased traffic.

It should be noted that the daily commuter construction workers and those leaving for the weekend may carpool. If that occurs, then the increase in vehicles on the road because of project construction would be less than the 200 and 1,200 vehicles mentioned previously.

Parking for the construction workers (including those commuting daily and those living onsite would be provided at the power plant site, which has sufficient area to accommodate large numbers of personal vehicles.

Because I-15 and I-80 were designed to handle interstate traffic, they would adequately handle the loads of semi-trucks and trailers. Therefore, construction of the Station Proposed Action would not affect existing interstate highway conditions. Similarly, the U.S. and state highways were designed to handle semi-truck and trailer loads. Therefore, Station construction would not affect existing U.S. and state highway conditions.

Prior to project construction, access roads to the Proposed Action power plant site and ancillary facilities (transmission line, water pipeline, wells, and rail spur) would be improved to accommodate materials delivery vehicles, equipment, and construction worker transport vehicles. The access roads would be constructed to be wide and straight enough to accommodate semi-trucks and trailers, and may need to be paved.

The Proposed Action power plant would operate 24 hours per day, 365 days per year. The plant would be operated by an estimated 135 full-time employees who would work in three shifts: 65 employees from 7:00 a.m. to 3:00 p.m.; 35 employees from 3:00 p.m. to 11:00 p.m.; and 35 employees from 11:00 p.m. to 7:00 a.m. These 135 employees would generate an additional 270 vehicle trips per day associated with project operation (if they all commuted daily (100 trips at 7:00 a.m., 100 trips at 3:00 p.m., and 70 trips at 11:00 p.m.). This amount of operation-induced traffic would not adversely affect local highways or the traffic patterns of the U.S. 93 onramp/offramp to the project site. In addition, it would not change the LOS of the highways. The operations personnel vehicle trips at 7:00 a.m. and 3:00 p.m. have the potential to create a public safety risk to children traveling to and from school at those times because of increased traffic.

Because no train deliveries to the power plant site are anticipated to occur during Station construction, no effect on NNR operations is expected. However, if the NNR is upgraded in time for train deliveries during Station construction, this use would be consistent with one of the intended and desired uses of the NNR and would reduce the number of highway deliveries. The proposed transmission line would be aligned so that it would cross the NNR rail line in one location. Construction of the transmission line would be coordinated with NNR operations personnel to minimize impacts on rail operation in the Station vicinity.

An estimated 12 loads of coal would be delivered by train to the Proposed Action power plant site each week when the power plant is operational. Prior to the plant becoming operational, the existing NNR rail line would be rehabilitated in the vicinity of the Proposed Action as part of a separate, but connected, action. The NNR rehabilitation would be 110 miles long and extend from Shafter south past the

Proposed Action (and Alternative 1) power plant site to McGill. That rehabilitation would allow service to the Proposed Action power plant site in addition to other proposed uses of the railroad. The increased rail traffic from the Proposed Action would not affect these other uses. Several sidings to allow the passage of trains would be provided along the NNR (perhaps one near Shafter and one approximately midway between Shafter and the Proposed Action power plant site).

The Proposed Action would include a spur line from the main track to the power plant site. Construction of the spur line would not interfere with existing road or rail traffic patterns in the area because of the lack of existing roads in the area and because the construction contractor would coordinate construction activities with NNR operations personnel.

Potential impacts of NNR rehabilitation and operation are addressed in an Environmental Assessment (David Evans and Associates, Inc., 2002) that was prepared in support of a grant application to the U.S. Department of Commerce, Economic Development Administration, by the City of Ely. Potential transportation-related impacts of NNR rehabilitation and operation are summarized below in Section 4.18.3, *Connected Actions*. Potential impacts of coal train traffic (12 trains per week) are addressed in applicable sections of Chapter 4.

4.18.1.2 Mitigation

As a component of requirements to obtain, an enchroachment permit to access U.S. 93, WPEA will coordinate with the Nevada Department of Transportation regarding levels of traffic expected during Station construction, modifications that may be required to U.S. 93 to accommodate Station construction and operation workforce traffic. In addition, WPEA will work with the White Pine County School District and the White Pine County Road Department regarding the routes used by school buses and by children walking to local schools so that routes to the Station site can be established for Station materials and concrete deliveries and Station operation personnel that would minimize the public safety impact.

4.18.2 Alternative 1

Traffic impacts associated with Alternative 1 for both Station construction and operation would be similar to those described for the Proposed Action.

Mitigation taken as part of the Proposed Action to minimize traffic impacts would also be applicable to Alternative 1.

4.18.3 Connected Actions

4.18.3.1 SWIP

Construction of the SWIP would require that heavy vehicles access the tower sites along the transmission line ROW. Roads along existing utility corridors would be used where possible. When existing roads are used, spur roads would be constructed to the tower sites. Where no roads exist, new access and spur roads would be constructed to the tower sites. Impacts on highways and other major public roads would be limited to the increase in traffic from trucks and equipment used to construct new access roads and from equipment used to construct towers. Disruptions to existing traffic from this additional traffic would be short-term, minimal, and localized (BLM, 1993).

4.18.3.2 NNR

Restoration of NNR freight service would improve the rail transportation of goods to and from White Pine County, which is a beneficial impact. However, the potential exists for train-vehicle accidents at grade crossings, delays of vehicle traffic at grade crossings, train collisions at crossings with other rail lines, and train derailments (David Evans and Associates, Inc., 2002). CRS and MSC (2005) reported that there are 9 public and 13 private at-grade road crossings between NNR mileposts 18.5 and 115. These crossings generally do not meet current standards and would require rehabilitation because of structural deficiencies and lack of proper signage and paint striping. Rehabilitated road crossings would comply with requirements and specifications of the Nevada Department of Transportation, White Pine and Elko Counties, Public Utilities Commission, and the Federal Railroad Administration (CRS and MSC, 2005).

David Evans and Associates, Inc. (2002) stated that the potential for transportation conflicts and accidents would be prevented or minimized by providing railroad crossing stop signs at private road crossings, flashing lights and crossbucks at public road crossings, and electric locks at crossings with other rail lines. Tourist excursion trains and rail freight services on the NNR would be scheduled to avoid conflicts and the potential for collisions with one another (David Evans and Associates, Inc., 2002). CRS and MSC (2005) recommended that a railroad siding be constructed somewhere between NNR mileposts 49 and 61 to allow trains to safely pass. CRS and MSC (2005) also identified the likely need for the rehabilitation and enlargement to approximately 10,000 feet of the NNR and Union Pacific Railroad sidings near the Shafter Interchange to allow room for trains, locomotives, and clearances from the switches and signals at these locations.

The likelihood of an NNR train derailment and release of a hazardous material is quite small, but it is not zero. David Evans and Associates, Inc. (2002) concluded that if such an event were to occur, the potential impact is not expected to be substantial because of the largely vacant and undeveloped lands adjacent to the NNR Rail Line, the low density of nearby developments, anticipated limited train traffic, compliance with Federal Railroad Administration safety regulations to prevent derailment, and implementation of emergency procedures if a spill occurred (David Evans and Associates, Inc., 2002).

4.18.4 No Action Alternative

No Station-related impacts on transportation would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.19 Cumulative Impacts

4.19.1 Introduction

This section addresses potential cumulative impacts that would result from the effects of the White Pine Energy Station Proposed Action or Alternative 1 when combined with the effects of other past, present, and reasonably foreseeable future projects. Reasonably foreseeable projects include those future actions that have been sufficiently defined to be: (1) relevant to potential impacts; (2) within the Station project area of influence; and (3) of a magnitude that could potentially result in a significant cumulative impact. Eleven interrelated projects were identified in Section 1.7 whose effects may extend across a broad range of resources assessed in this document and possibly result in cumulative impacts on those resources. Descriptions of these interrelated projects are presented in the following text in Section 4.19.2, *Description of Projects Considered for Cumulative Analysis*. A discussion of the specific resources not cumulatively impacted is presented in Section 4.19.3, *Resources Not Cumulatively Impacted.* That section is followed by a discussion of resources that were analyzed in detail for potential cumulative impacts (see Section 4.19.4, *Resources Analyzed in Detail for Potential Cumulative Impacts*).

Potential cumulative effects of the 11 interrelated projects, and of any other interrelated projects whose potential cumulative effects would be very resource-specific (for example, other projects that may only affect air quality), are described in the following text. Data on interrelated projects were sufficient for determining those resource areas where cumulative impacts would be expected and where they would not, and for assessing qualitatively or quantitatively (depending on the level of detail available) the potential for cumulative impacts on regionally important resources such as ground water, air quality, and others.

4.19.2 Description of Projects Considered for Cumulative Analysis

Eleven projects were considered in the cumulative impact analysis. They include six power generation or conveyance projects, two railroad (upgrade and operation) projects, and three individual projects associated with a municipal airfield, ground water production, and lake expansion. Figure 1-2 in Chapter 1 shows the locations of these projects in relation to the White Pine Energy Station Proposed Action and Alternative 1 power plant sites.

4.19.2.1 Southwest Intertie Project (also a connected action)

The Southwest Intertie Project (SWIP) was described in Chapter 2 in the discussion of connected actions (see Section 2.2.3.7.2, *Southwest Intertie Project).*

4.19.2.2 Nevada Northern Railway Upgrade (also a connected action)

The Nevada Northern Railway (NNR) upgrade was described in Chapter 2 in the discussion of connected actions (see Section 2.2.3.7.1, *Rehabilitation and Operation of Nevada Northern Railway).*

4.19.2.3 Nevada Northern Railway Operation (also a connected action)

The Nevada Northern Railway (NNR) operation was described in Chapter 2 in the discussion of connected actions (see

Section 2.2.3.7.1, *Rehabilitation and Operation of Nevada Northern Railway).*

4.19.2.4 White Pine County Airport (Yelland Field) Expansion

The proposed expansion of the White Pine County Airport consists of the conveyance of approximately 1,545 acres of public land to the county and the lengthening of the runway by approximately 5,000 feet. Facilities to be added include hangars for small aircraft. The airport would be fenced. An Environmental Assessment for the project is being prepared. Following the NEPA process, FAA will evaluate the project. No schedule for construction is available.

4.19.2.5 Basset Lake Expansion

White Pine County negotiated with Kennecott Copper Company of Nevada and NDOW regarding the purchase of Bassett Lake, surrounding acreage, and water rights. The County applied for a state Question 1 grant for 75 percent of the purchase price and worked with the Rocky Mountain Elk Foundation and other groups to secure the 25 percent match required. The purchase includes 6,000 acres and 53 cfs of water rights. The County would secure the funding, but NDOW would take ownership of the property and water rights directly from Kennecott. The proposal for development of the area once acquired is to replace the dam, improve the lake and wetlands, and provide recreational developments in the form of picnic areas, a boat launch, and restrooms. The Bassett Lake project grant funds have been awarded and a matching commitment has been made by the Rocky Mountain Elk Foundation, completing the agreement among Kennecott, White Pine County, and the State Lands Division.

4.19.2.6 Egan Range Wind Generating Project

A maximum of 200 wind turbine generators, with a maximum nominal design capacity of 1,800 MW, would be constructed in the proposed Egan Mountain Range near Telegraph Peak. The wind turbine generators would be supported on 140- to 328-foot-tall conical tubular steel towers with a foundation diameter of approximately 15 feet. They would be spaced a minimum of 400 feet apart. Rotor diameters would range from 229 feet to 361 feet. Ancillary improvements would include transformers, underground and overhead 34.5-kV collection and distribution lines, communication systems, access roads, meteorological towers, electric substations, and an operation and maintenance building. The overhead distribution line system would connect the energy-generating area to a new electrical substation. Power from the Proposed Egan Range Wind Energy Generating Facility would be transmitted approximately 32 miles via a new overhead transmission line to the existing Gondor Substation near McGill, Nevada, for delivery to the Sierra Pacific Power Company system serving northern Nevada. The 2.1-acre electric substations would be enclosed in a 10-acre fenced area. Access to the wind turbine generators in the Egan Mountain area would be via U.S. 93 and Warm Springs Road through Log Canyon Road. Road improvements and new road construction would be required on Egan Mountain. New construction and improvements to existing roads would be required for turbine access. An operations and maintenance facility would be constructed within the 2-acre laydown area collocated with the Proposed Egan Range Wind Energy Generating Facility.

4.19.2.7 Intermountain Power Project Phase III

Intermountain Power Service Corporation (IPSC) currently operates the Intermountain Power Project (IPP) site located near the town of Delta in Millard County, Utah. The plant consists of two conventional Babcock & Wilcox, drum-type, pulverized coal-fired, generating units. These units are designated Unit 1 and Unit 2, and have a currently approved, combined gross generation capacity of 1,900 MW. The IPP facility is a major stationary source of air emissions. The Intermountain Power Agency is proposing to expand the IPP facility by adding one additional nominal 950-gross MW (nominal 900-net MW) unit designated as Unit 3. The addition of Unit 3 to IPP would constitute a major modification of the existing major stationary source.

The IPP facility is located in an area of relatively low population density in the Sevier Desert of west central Utah. The IPP facility is situated in a broad valley that is favorable to plume dispersion. The nearest Class I area is approximately 149 kilometers southeast (Capitol Reef National Park). State-of-the-art pollution controls are proposed for Unit 3 that would make the new unit one of the cleanest pulverized coal-fired power plants in the nation. Nitrogen oxides emissions would be controlled by low nitrogen oxide burners, overfire air, and selective catalytic reduction to an outlet concentration of 0.07 pound/million British thermal units (lb/mmBtu). Sulfur dioxide emissions would be controlled by forced oxidation wet limestone flue gas desulfurization to an outlet concentration of 0.10 lb/mmBtu. Particulate matter less than 10 microns in diameter emissions would be controlled by a reverse air fabric filter baghouse to an outlet concentration of 0.015 lb/mmBtu.

The atmospheric dispersion modeling aspects of the project are required to ensure that construction of Unit 3 would not result in adverse impacts to the many National Parks and wilderness areas in Utah or to the area surrounding the plant. The air quality modeling performed by CH2M HILL demonstrates that the IPP will meet all NAAQS and the Class I and Class II PSD increments in the vicinity of the plant, which is described at (http://www.ch2m.com/corporate/services/site_and_infrastructure_planning/assets/ProjectPortfolio/Intermountain.pdf). Unit 3 is scheduled to start operation in 2012.

4.19.2.8 Newmont Gold Coal-Fired Power Plant

Newmont Gold's Nevada operations are constructing a 200-MW coal-fired power plant near the Carlin Trend. The Carlin Trend is North America's most prolific gold producing area, situated in north-central Nevada near Elko. It is a 40-mile-long northwest/southeast strip of low grade, epithermal deposits of ore, first located in 1961. Newmont plans to sell excess capacity from the plant to local utility Sierra Pacific Power Company. The plant will use low sulfur coal sourced from the Powder River Basin in northeastern Wyoming. Power plant construction commenced in 2006 with startup scheduled for the first half of 2008. The proposed power facility will employ up to 200 people during its 2-year construction period and will have an operating staff of about 25 employees.

4.19.2.9 Clark, Lincoln, and White Pine Counties Ground Water Development (GWD) Project (SNWA Project)

Southern Nevada Water Authority (SNWA) has applied to the BLM for ROWs to construct and operate a system of regional water supply facilities. The GWD Project includes construction and operation of ground water production wells, water conveyance facilities, and power facilities.

Total volume of water to be developed and conveyed through the project would be 180,000 acre-feet per year from Coyote Spring Valley, Delamar Valley, Dry Lake Valley, Tikaboo North Valley, Cave Valley, Spring Valley, and Snake Valley. The primary transmission pipeline would extend north from the Las Vegas Valley through Coyote Spring, Delamar, Dry Lake, and Spring Valleys. Secondary lateral pipelines are also planned into Snake, Cave, and Tikaboo North Valleys. All pipelines would be buried. Pumping stations would pump water over higher elevations. An aboveground 230-kV power line would be constructed along the transmission pipeline route with at least two new primary substations. The 230-kV power line would connect on the north end into the existing Gondor Substation near Ely.

4.19.2.10 Toquop Energy Coal-Fired Power Plant

Sithe Global Power's Toquop Energy Project is a proposed 750-MW coal-fired electric power plant with a natural draft cooling tower located 14 miles northwest of the City of Mesquite, Nevada in Lincoln County. The project would be fueled by Wyoming, Powder River Basin low-sulfur coal and provide electrical power to utilities in Nevada. The electric power-generating facility would be located on a 640-acre parcel of land. The plant would average 812 construction workers for the 4-year construction period, and 110 full time operations personnel. The direct and indirect payroll during construction would average $159 million per year over the 4-year construction period and $14.8 million per year during plant operations.

In 2003, an EIS for the proposed Toquop Power Project and other permitting requirements were completed for a 1,100-MW natural gas-fired power plant in Lincoln County. In July 2005 an amended application was received for a coal-fired power plant at the same location. BLM has determined that a new EIS must be completed to evaluate the components of Sithe Global's proposed project that vary from previously permitted technology and facilities. These components include the reduction of plant capacity from 1,100 to 750 MW, an expanded site plan for coal and coal-handling facilities, construction of a rail spur for the coal, and the change in technology for a coal-fired facility, including air pollution control technology. The plant would require up to 2,500 acre-feet of water annually and would be supplied by existing water rights purchased via the Lincoln County Water District.

4.19.2.11 Ely Energy Center

Sierra Pacific Power Company and Nevada Power Company propose to construct a coal-fired power facility in White Pine County and approximately 540 to 630 miles of new 500-kV electric transmission line. Proposed and alternative power plant sites for the Ely Energy Center are located in Steptoe Valley, approximately 18 miles north of Ely

(South Steptoe Valley site—the preferred site) and 50 miles north of Ely (North Steptoe Valley site). Each power plant site would require approximately 3,000 acres of land, including approximately 1,000 acres for landfilling ash and other combustion by-products.

The facility would be constructed in two phases. Phase 1 would include constructing two, 750-MW units that use pulverized coal technologies. The first unit is expected to become operational in December 2011 followed by the second unit in June 2013. Phase 2 would include constructing two 500-MW integrated gasification combined cycle units when this technology is determined to be commercially viable. When fully built out, the project would total 2,500 MW of generating capacity. Project life is estimated to be 50 years

The electric transmission facilities would interconnect the Ely Energy Center with the Sierra Pacific Power Company and Nevada Power Company electric system in northern and southern Nevada. Specific facilities would include two new 500-kV transmission lines, expansion of the existing 500-kV Harry Allen switching station, one new 500-kV switching station at the Ely Energy Center, and one new 500/345-kV switching station. Other facility requirements include a water supply well field and pipeline to the power plant, power to the water supply pump stations, a rail spur for access to the existing NNR system for fuel delivery, permanent and temporary access roads from U.S. 93 to the power plant site, an electrical distribution line for construction power, and access along all of the linear facilities. Approximately 8,000 acre-feet of water would be required annually for both Phase 1 units, with a peak flow rate of approximately 15,000 gallons per minute (gpm). Water supplied to the South Steptoe Valley power plant site would come primarily from ground water at a well field in southern Butte Valley via a 40-mile-long pipeline. Two other possible water sources for the South Steptoe Valley site that are being evaluated are a surface water supply at Duck Creek impoundment and a ground water supply near Lages Station in northern Steptoe Valley. Possible water sources being evaluated for the North Steptoe Valley power plant site are the southern Butte Valley well field, the ground water supply near Lages Station in northern Steptoe Valley, and the Duck Creek impoundment.

4.19.3 Resources Not Cumulatively Impacted

Results of impact analyses presented in Sections 4.2 through 4.18 of this chapter show that some resources in the White Pine Energy Station project area would either: (1) not be impacted by the Station Proposed Action or Alternative 1; or (2) potential impacts would be very minor, localized, and/or temporary and not overlap with the area of influence for interrelated projects. In these instances, neither the Station Proposed Action nor Alternative 1 would contribute to cumulative impacts. These resource areas were not selected for detailed analysis for cumulative impacts and are not discussed further in this section. They are as follows:

- Geology and Minerals
- Surface Water Resources
- Rangeland Resources
- Wilderness and Areas of Critical Environmental Concern
- Wastes, Solid and Hazardous
- Native American Religious Concerns
- Environmental Justice

- Paleontological Resources

4.19.4 Resources Analyzed in Detail for Potential Cumulative Impacts

The potential for cumulative impacts was analyzed for those resources that would be impacted by the Station Proposed Action or Alternative 1. Potential cumulative impacts for affected resources are discussed in the following text. Those resource areas are as follows:

- Soils
- Ground Water Resources
- Biological Resources
- Air Quality and Noise
- Visual Resources
- Recreation Resources
- Land Use
- Cultural Resources
- Socioeconomics
- Transportation

4.19.4.1 Soils

4.19.4.1.1 Proposed Action

Potential Station-related impacts on soils (removal, covering, compaction, and loss from production) would be localized and limited to areas associated with project features. Potential regional cumulative effects on soils may result from nearby projects, including construction and operation of the proposed Ely Energy Center, upgrade and operation of the NNR, and construction and operation of the SWIP. The degree and types of potential effects of the Ely Energy Center on soils would be expected to be generally similar to those of the White Pine Energy Station Project, while NNR effects on soils would be minimal and limited to the area within the NNR rail line alignment. Potential SWIP-related cumulative effects on soils would be minimal and localized or lacking. Potential cumulative effects on soils resulting from several other projects in the vicinity, including the proposed Egan Range Wind Generating Project and the White Pine County Airport Expansion, also would be expected to be minimal and localized.

4.19.4.1.2 Alternative 1

Potential cumulative effects on soils under Alternative 1 would be similar to those described for the Proposed Action.

4.19.4.2 Ground Water Resources

4.19.4.2.1 Proposed Action

Under the Proposed Action, pumping ground water from basin-fill aquifers in Steptoe Valley could result in localized ground water level declines between 2 and 6 feet in the vicinity of several nearby springs on the floor of Steptoe Valley. To the extent possible, operation of the water supply wells would be planned to avoid adversely affecting ground water levels in the vicinity of other existing wells and water resources features, such as springs. However, it is unknown at this time whether all potential effects could be avoided.

The Ely Energy Center would be located approximately 15 miles south (proposed Ely Energy Center site) or 15 miles north (alternative Ely Energy Center site) of the White Pine Energy Station Proposed Action site. Depending on the location of the Ely Energy Center well-field compared to the White Pine Energy Station well-field location, the potential exists for cumulative effects on ground water resources.

The proposed primary source of water to the Ely Energy Center is a wellfield located in Butte Valley, which is the hydrographic area to the west of Steptoe Valley. If the source of water is a wellfield in Butte Valley, then no cumulative impacts would be related to the Proposed Action and ground water resources in Steptoe Valley. However, the proposed secondary source of water for the Ely Energy Center is the Lages Station ground water source. Although the well field associated with this source of water is only conceptual at this stage, it would be located approximately 14 miles north of the northern-most well in the White Pine Energy Station Proposed Action well field. If all of the water demand for the Ely Energy Center (16,000 acre-feet pre year at completion of the Phase II buildout) were obtained from pumping at the Lages Station ground water source, there most likely would be cumulative effects on ground water resources in the Steptoe Valley, including impacts to spring discharge that would not be anticipated to occur with only the White Pine Energy Station. Most likely, these impacts would be largely from the concentrated pumping of this much water from a single general area in the northern portion of Steptoe Valley to meet the demands of the Ely Energy Center, irrespective of the White Pine Energy Station. If only Phase I of the Ely Energy Center were ultimately built, pumping the associated water demand from the Lages Station ground water source (8,000 acre-feet per year) could also have cumulative effects on ground water resources in Steptoe Valley including spring discharge. Noted springs in the vicinity of Lages Station (for example, Collar and Elbow Spring) could be affected by Phase I of the Ely Energy Center irrespective of the White Pine Energy Station.

The intent is to operate the White Pine Energy Station in a manner that would minimize or avoid adverse effects on ground water resources including related effects on spring discharge. No quantitative ground water modeling results or other information are available for the proposed Ely Energy Center to assess further the potential for cumulative impacts on ground water resources. No other projects considered in the cumulative impacts analysis would be close enough to the Station or are expected to require ground water resources to the extent that cumulative effects would be expected.

4.19.4.2.2 Alternative 1

No potential Station-related impacts on ground water resources are predicted to occur under Alternative 1. In addition, the potential sources of ground water supply to the Ely Energy Center are located either in another hydrographic area (Butte Valley) or over 40 miles from the White Pine Energy Station Alternative 1 wellfield (Lages Station ground water source). It is anticipated there would be no cumulative effects on ground water resources under Alternative 1. However, as noted for the White Pine Energy Station Proposed Action, the water demands and the location of the identified potential source of ground water for the Ely Energy Center could impact ground water resources and associated spring discharge in the Steptoe Valley irrespective of the White Pine Energy Station.

As also noted for the White Pine Energy Station Proposed Action, no quantitative ground water modeling results or other information are available for the proposed Ely Energy Center to assess further the potential for cumulative impacts on ground water resources. In addition, no other projects considered in the cumulative impacts analysis would be close enough to the Station Alternative 1 well field or are expected to require ground water resources to the extent that cumulative effects would be expected.

4.19.4.3 Biological Resources

4.19.4.3.1 Vegetation

Proposed Action

The White Pine Energy Station would disturb vegetative cover that provides habitat for a variety of wildlife species. Potentially reduced flows and water levels at 12 springs near the Proposed Action power plant site resulting from ground water pumping may adversely affect plant species associated with spring environments. Cumulative impacts to vegetation resources resulting from the projects described in Section 4.19.2 would result in additional loss of native vegetation within the development footprint and areas of increased activity in Steptoe Valley. Construction and operation of the Ely Energy Center in Steptoe Valley would result in a similar amount of impact to vegetation resources as the Proposed Action. In addition, the Ely Energy Center could result in additional impacts to vegetation communities associated with springs and drainages if ground water pumping lowers water availability.

SWIP development would result in the temporary disturbance to vegetation during construction and the permanent loss of vegetation at tower bases, access roads, spur roads, and substations (BLM, 1993). Increased access associated with construction and long-term maintenance of the SWIP would result in impacts to vegetation in some areas. In addition, if the proposed expansions of Basset Lake and the White Pine County Airport move forward, they would have a very localized cumulative effect on vegetation in proximity to the White Pine Energy Station project area.

The upgrade and operation of the NNR would result in some removal of vegetation within the existing NNR Rail Line alignment during restoration activities. Impacts to vegetation communities would not likely be substantial because of the abundance of vegetation in the surrounding areas. Some wetlands along the NNR tracks could be impacted. Approximately 2 to 7 acres of wet or vegetated areas within the NNR Rail Line alignment would be permanently impacted from widening the NNR roadbed (CRS and MSC, 2005).

In addition to the projects listed in Section 4.19.2, continued livestock grazing on BLM-administered lands would contribute to determining the overall species composition and structure of vegetation communities throughout the area.

Alternative 1

Potential cumulative effects on vegetation under Alternative 1 would generally be the same as described for the Proposed Action, with the following exception. It is not anticipated that springs or plant species associated with spring environments would be affected under this alternative.

4.19.4.3.2 Noxious and Invasive Weeds

Proposed Action

Cumulative impacts described in the preceding text for vegetation could also result in an increase in noxious and invasive weed populations if temporarily disturbed areas are not properly reclaimed. The additional public access is likely to result in an increase of weed populations along access roads and developed areas.

Alternative 1

Cumulative impacts under Alternative 1 would be the same as described for the Proposed Action.

4.19.4.3.3 Wildlife and Fisheries Resources

Proposed Action

The White Pine Energy Station Project, NNR, SWIP development, and Ely Energy Center would disturb habitat for a variety of wildlife species within Steptoe and Butte Valleys. Some residual unavoidable adverse effects on wildlife would potentially occur from all projects, including mortalities of unprotected reptile and small mammal species, loss of foraging and nesting habitats, and increased noise and human disturbance in the valleys. Potentially reduced flows and water levels at 12 springs near the Proposed Action power plant site resulting from ground water pumping may adversely affect wildlife and fisheries resources associated with spring environments. The Ely Energy Center may also add to ground water declines that could lead to impacts to sensitive aquatic resources. Elevated noise levels as the result of operation and construction of cumulative actions would reduce habitat suitability near these features.

The other activities and projects described in Section 4.19.2 would contribute to cumulative habitat loss, disturbance, and direct mortality of wildlife. Of these activities and projects, the Ely Energy Center would potentially contribute the greatest number of cumulative effects to all wildlife. Construction and operation of multiple energy developments in Steptoe Valley would result in cumulative impacts to wildlife including: increased noise and human activity leading to wildlife disturbance; increased direct mortality of wildlife species within the development footprint; further removal and fragmentation of foraging habitats and of winter, summer, and breeding habitats for a variety of wildlife species; potential aquatic and water quality impacts; increased risk of collision as a result of additional power and distribution lines; increased perching opportunities for birds of prey, leading to further adverse effects on prey species such as the greater sage-grouse and other ground-nesting birds; and increased poaching potential. As discussed previously for ground water resources under the Proposed Action, it is uncertain whether there is a potential for cumulative effects on spring water levels and, therefore, cumulative effects on wildlife and fisheries resources using those springs.

Alternative 1

Potential cumulative effects on wildlife, fisheries, and their habitat under Alternative 1 would generally be the same as described for the Proposed Action, with the exception of impacts to spring resources. It is anticipated there would be no effects on ground water under Alternative 1 and, therefore, no cumulative effects on springs or on wildlife and fisheries resources using those springs.

4.19.4.3.4 Threatened, Endangered, Candidate, and Sensitive Species

Proposed Action

Potential effects of the Proposed Action on special status species in the project area were described in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*. The other activities and projects described in Section 4.19.2 are likely to contribute to cumulative effects to special status species, when combined with the effects of the White Pine Energy Station.

Of the projects and activities listed above, the proposed Ely Energy Center would be expected to potentially contribute the greatest number of cumulative effects to all wildlife species, including special status species, in Steptoe Valley and Butte

Valley. Construction and operation of multiple energy developments in Steptoe Valley would result in cumulative impacts to special status species including: increased human presence; increased direct mortality of wildlife species within the development footprint; further removal and fragmentation of foraging habitats and of winter, summer, and breeding habitats for a variety of wildlife species; potential aquatic and water quality impacts; increased risk of collision as a result of additional power and distribution lines; increased perching opportunities for birds of prey, leading to further adverse effects to prey species such as the greater sage-grouse; and increased poaching potential. If built closer to Basset Lake, another energy project such as the Ely Energy Center could have greater impacts to species associated with Basset Lake through increased noise levels and human activity.

Increased transmission line development in both Steptoe Valley and Butte Valley would continue to fragment habitat for a number of special status species, particularly greater sage-grouse. Within Butte Valley, former active leks located adjacent to or within an existing power line ROW are no longer in use. Increased development in Steptoe Valley would continue to cause a reduction in overall habitat quality and extent within the valley.

In addition to those projects described in Section 4.19.2, continued livestock grazing may contribute to adverse effects on endemic springsnail populations that rely on the isolated springs. Livestock grazing can reduce water quality and lead to a reduction in the health of spring function and vegetative structure.

Further water diversion in Steptoe Valley may lead to additional adverse effects to endemic springsnail populations, relict dace, and northern leopard frogs. Reduction in available ground water over time as a result of water diversion projects would eventually result in adverse effects to waterfowl, migratory bird species, and greater sage-grouse, among others. However, as discussed previously for ground water resources under the White Pine Energy Station Proposed Action, it is uncertain whether there is a potential for cumulative effects on spring water levels, and therefore on special status species using those springs, that would be attributable to the White Pine Energy Station.

Alternative 1

Potential cumulative effects on special status species under Alternative 1 would generally be the same as described for the Proposed Action, with the following exception. As described previously for ground water resources, it is anticipated there would be no cumulative effects on ground water under Alternative 1 and, therefore, no cumulative effects on springs or on special status species using those springs.

4.19.4.4 Air Quality and Noise

4.19.4.4.1 Air Quality

Nevada Northern Railway

The NNR line was originally built by Nevada Consolidated Copper Company in 1905. The rail line extends approximately from the historic town of Cobre to Ely, Nevada. Use of the rail line ceased in the late 1990s and it has fallen into disrepair. The City of Ely and the White Pine Railroad Foundation currently own the rail line and intend to rehabilitate the track. Railroad upgrade activity would involve emissions from the constructions. However, these emissions would be of short duration. The increase in railroad operations for freight rail service and tourist excursions would also have emissions from the diesel engines. Air quality impacts of these actions would be of short duration and intermittent. Even though these impacts are cumulative, the impacts from construction activities and locomotive operations would not be expected to contribute substantially to cumulative impacts on the local air quality.

White Pine County Airport Expansion

The proposed White Pine County Airport expansion has been planned at the current airport site approximately 20 miles south of the Station Alternative 1 power plant site. No data were available to conduct an in-depth analysis of cumulative air quality impacts from this project.

Basset Lake Expansion

No significant air quality impact is expected from the development of recreational use of Basset Lake.

Intermountain Power Project Phase III

The proposed IPP Unit 3 would be located near the town of Delta in Millard County Utah, approximately 120 miles east of the proposed Station site and well outside the radius of impact of the Station. Air quality impacts from the proposed IPP Unit 3 on the Class II area surrounding the Station site would be insignificant. No cumulative analysis was conducted for IPP Unit 3 impacts.

Newmont Gold Coal-Fired Power Plant

Newmont Gold has permitted a 200-MW coal-fired power plant approximately 120 miles north of the Station site near Carlin Trend. Again, the project is well outside the radius of impact of the Station and as such it is assumed that the air quality impact from the proposed Newmont Gold power plant would be insignificant on the surrounding Class II area.

Toquop Energy Coal-Fired Power Plant

Because permit applications have not been filed for the Sithe Global Power Toquop Plant, any emission estimates from this facility would be speculative. Furthermore, the Toquop project would be well outside the radius of impact of the Station. As such, the project was not considered for cumulative impacts analysis.

Ely Energy Center

Nevada Power Company and Sierra Pacific Power Company have filed a Preliminary Plan of Development with the Public Utility Commission of Nevada for the construction of 2,500 MW coal–fired generation facility near Ely, Nevada. The initial phase would consist of two 750-MW supercritical pulverized coal–fired units. The second phase would be comprised of two additional 500-MW IGCC units, when the IGCC technology is commercially viable. The impact of the Ely Energy Center and the White Pine Energy Station would likely overlap due to close proximity. However, at this time no detailed emissions information or stack height information for the Ely Energy Center is available to estimate cumulative impacts of the Station and the Ely Energy Center. The Nevada Department of Environmental Protection in their air permit review process would consider cumulative impacts where one or both projects are greater than Significant Impact Levels.

4.19.4.4.1.1 Proposed Action

The air quality impact assessment presented in Section 4.6.1, *Air Quality,* also contains a cumulative impacts analysis. That analysis considered all increment-consuming sources as required by federal land managers and concluded that all predicted concentrations are well below the regulatory PSD Class I increments.

4.19.4.4.1.2 Alternative 1

Conclusions for the air quality cumulative impacts analysis for the Proposed Action also apply to Alternative 1.

4.19.4.4.2 Noise

The potential for cumulative effects of noise from the White Pine Energy Station and several other projects identified in Section 14.9.2 on wildlife resources and on Threatened, Endangered, and Candidate species was described in Sections 4.19.4.3.3 and 4.19.4.3.4, respectively.

4.19.4.5 Visual Resources

4.19.4.5.1 Proposed Action

Some of the larger facilities associated with the Proposed Action such as cooling towers, stacks, and transmission lines would be visible from many locations throughout Steptoe Valley. Depending on the distance from which the facilities would be viewed and the VRM Class in which they are located, the larger Station facilities would be consistent with VRM objectives from some locations and inconsistent from other locations. The cooling towers and stacks would not meet VRM Class II objectives (and in some cases Class III objectives) when viewed from relatively close proximity (within approximately 1 to 2 miles of viewers). However, as described in Chapter 4, most views of the Station facilities would be from greater distances and frequently would meet both Class II and Class III objectives.

Several of the projects identified in Section 4.19.2 would have cumulative impacts to visual resources. Many of these projects would have challenges meeting VRM Class II and III objectives when viewed up close, but would meet them when viewed from greater distances. The project that would have the greatest cumulative impact on visual resources would be the proposed Ely Energy Center. It would contain many of the large-scale facilities that the Station Proposed Action would contain and would be very visible from throughout Steptoe Valley. It would be more visible from McGill and Ely than the Proposed Action would be. If the same precautions regarding reducing the impacts of project lighting that are proposed for the White Pine Energy Station would be used for the Ely Energy Center Project, the cumulative impacts on "Dark Skies" would be greatly reduced. The Egan Range Wind Generating Project would introduce new large-scale visual elements (turbines and transmission lines) along the top of the Egan Mountain Range on the west side of Steptoe Valley. Some project elements such as the turbines and FAA-required lights on top of turbines (that would be seen at night) would potentially be seen throughout parts of Steptoe Valley. They would cumulatively add more human-made elements to the viewed landscape of what is currently an area largely devoid of large-scale human development. The SWIP would also add large-scale human-made elements (transmission line towers) to the viewed landscape. Its impacts would be most obvious in areas where the transmission line would parallel U.S. 93, designated Byways, and along access ways into the Goshute Canyon Wilderness.

4.19.4.5.2 Alternative 1

Potential cumulative effects on visual resources under Alternative 1 would generally be the same as described for the Proposed Action. However, depending on the location of the Ely Energy Center, the impacts could be more concentrated farther south in Steptoe Valley.

4.19.4.6 Recreation Resources

4.19.4.6.1 Proposed Action

The projects described in Section 4.19.2 would add additional large structures in addition to those of the proposed White Pine Energy Station that could be visible from Cherry Creek, from some of the lower slopes of the Goshute Canyon Wilderness and possible from parts of three other recently designated Wilderness Areas (Bristlecone, Becky Peak, and High Schells). Because Wilderness is intended to provide for the experience of an area being "untrammeled by man," this could present a negative recreational experience to the user. The SWIP, NNR, and northern alternative of the Ely Energy Center would be those projects most likely to be visible and potentially contribute to cumulative adverse effects on Wilderness. The southern alternative of the Ely Energy Center would also be highly visible from Bassett Lake. The expansion at Bassett Lake itself would have a positive effect on recreation in Steptoe Valley. Depending on the location of wind turbines and related transmission facilities, elements of the Egan Range Wind Generating Project, it too could be visible from key recreational areas in Steptoe Valley.

Development of the Egan Range Wind Generating Project and Ely Energy Center would eliminate additional open space that is presently available for recreational uses. During the construction periods, an influx of temporary workforce would increase pressure on existing recreational resources in the Ely area. Although recreational resources in the area were determined to be capable of accommodating the demand for recreation associated with the White Pine Energy Station construction and operation workforce, the cumulative demand for recreation added by the construction and operation of other reasonably foreseeable future projects may exceed the capability of recreation resources in the Station project area to meet said demands.

Four Wilderness Areas lie within the White Pine Energy Station study area. Goshute Canyon Wilderness is located in the Cherry Creek Mountains in northern White Pine County. Goshute Canyon Wilderness comprises approximately 42,544 acres of BLM-managed land. Bristlecone Wilderness is located in the Egan Range, approximately 3 miles west of McGill. Bristlecone Wilderness comprises approximately 14,095 acres of BLM-managed land. Becky Peak Wilderness is located in the Schell Creek Range in northern White Pine County. Becky Peak comprises approximately 18,119 acres of BLM-managed land. High Schells Wilderness is located in the Schell Creek Range, approximately 3 miles east of McGill. High Schells Wilderness comprises approximately 121,497 acres of USFS-managed land.

4.19.4.6.2 Alternative 1

Potential cumulative effects on recreation under Alternative 1 would be nearly identical to those described for the Proposed Action. The degree and location of potential cumulative impacts during construction would depend on whether the Ely Energy Center is constructed 90 miles north (Ely alternative site) or 10 miles south (Ely Proposed Action site) of the White Pine Energy Station Alternative 1 site and how many workers are in the area at any one time.

4.19.4.7 Land Use

4.19.4.7.1 Proposed Action

Potential cumulative effects of the projects described in Section 4.19.2 on land use include an incremental loss of public grazing land, and depending on the exact location of the other projects, increased conflicts with private land uses, mining districts, or BLM land use authorizations. The Ely Energy Center and the Egan Range Wind Generating Project present the greatest potential for effects because of their size and location. Although available rangeland would be reduced, the relative reduction resulting from the cumulative development would be minimal.

4.19.4.7.2 Alternative 1

Impacts under Alternative 1 would generally be the same as described for the Proposed Action.

4.19.4.8 Cultural and Historical Resources

4.19.4.8.1 Proposed Action

Each of the projects described in Section 4.19.2 would result in an increased risk of ground-disturbing activities, potentially adversely impacting significant archaeological sites in the region. The degree of impact to archaeological resources would depend on the exact project location and extent of ground disturbance. Similarly, the Ely Energy Center, SWIP, and Egan Range Wind Generating Project would add additional structures that may be visible from historic properties. If the projects are located where they would significantly alter characteristics of the property, they may not qualify for inclusion in the NRHP. Restoration of the NNR could disturb historical resources along the ROW, which itself is eligible for NRHP listing. Other historical resources potentially impacted from the cumulative development within the region include the Pony Express National Historic Trail, the Lincoln Highway, and six historic ranches in Steptoe Valley.

4.19.4.8.2 Alternative 1

Potential cumulative effects on cultural and historical resources under Alternative 1 would be similar to those described for the Proposed Action.

4.19.4.9 Socioeconomics

4.19.4.9.1 Proposed Action

Overall, development of the projects listed in Section 4.19.2 would lead to additional economic benefits in White Pine County and the following three out-of-county areas:

- Areas that supply coal for the proposed coal projects,
- Locations that provide the material used during construction of the projects, and
- Those areas where power generated by the proposed projects is used.

The types of benefits that would occur in the out-of-county areas listed above are described in more detail in the out-of-county effects discussion in Section 4.17.1.1.2. They include, but are not limited to, positive income and employment impacts, additional property, sales and income tax revenue, and in areas where the power is used, a relatively more reliable and affordable power supply, which in turn would result in additional economic benefits.

The energy projects and other types of proposed development projects described in Section 4.19.2 and located within White Pine County would lead to many positive economic impacts within White Pine County. These projects would help diversify the local economy, resulting in less dependence on the boom-and-bust cycle of the mining industry. Beneficial and much-needed increases in tax revenue would be realized by White Pine County, its local agencies and special districts, as well as the State of Nevada.

The number of construction workers for these projects would vary greatly, but in the case of the Ely Energy Center Project, both construction and operation work forces could be similar to or greater than those needed for the White Pine Energy Station. Because there could be an overlap in the construction schedules of the Station and Ely Energy Center, the increases in the area's temporary population relative to its current population could be substantial with a combined total peak work force of as many as 3,200 workers. While planning for the Ely Energy Center is in its early stages and thus many of the project details are not known at this time, including project BMPs and mitigation that could help minimize or avoid potentially adverse socioeconomic impacts, worker housing arrangements for the Ely Energy Center would likely be similar to the White Pine Energy Station. Based on these worker housing plans and White Pine County's past experience with the construction of large projects (Rajala, 2007), the majority of the workforces for both projects would likely stay in the area for a relatively short period of time while their specific areas of expertise are used. Under this likely scenario, the majority of the workers would not bring their families, they would stay in temporary housing, and there would be minimal impact on family related infrastructure and services. Workers that do bring their families would likely live in temporary housing in or near Ely.

Given the temporary nature of the workforce demands for public services, the large amount of new tax revenue to be generated by both projects and expected to be available to White Pine County and its affected agencies, and the BMPs associated with the White Pine Energy Station and likely to be associated with the Ely Energy Center, family-related infrastructure and services would likely incur less-than-significant impacts.

Note that, as summarized in Section 4.17.1.1.1, the new tax revenue stream to be realized by White Pine County from the WPES is expected to average about $26 million per year during the project's construction period. A preliminary fiscal analysis conducted by the Nevada Commission on Economic Development (Nevada Commission on Economic Development. 2007), estimated the direct annual tax revenue to be received by White Pine County and its neighboring counties from the ECC to be approximately $52 million per year over an assumed ten year construction period. This analysis further assumes White Pine County would receive the "strong majority" of these positive fiscal impacts.

Nevertheless, the expected construction of multiple projects with multiple phases may mean that workers may be in the area long enough to relocate their families, thus increasing the construction-related impacts on schools, pre-school and day care, medical services, and recreation facilities and programs.

Economic diversification and increased employment opportunities associated with the NNR's upgrade and operation could lead to long-term, sustained growth in the region (David Evans and Associates, Inc., 2002), including expansion of mining activities and other types of new economic development that is located to benefit from the enhance transportation network. An increase in the area's long-term population growth could create additional demand for public services and other community-based infrastructure and resources; however, these effects would likely be less-than-significant as White Pine County's tax base, fiscal health, and public services improve over time. The projects would substantially increase the economic activity in the area, although a great deal of the materials would likely be purchased outside of the region.

4.19.4.9.2 Alternative 1

Potential cumulative effects on socioeconomics under Alternative 1 would be similar to those described for the Proposed Action.

4.19.4.10 Transportation

4.19.4.10.1 Proposed Action

White Pine Energy Station impacts on transportation would include traffic increases during project construction on highways that are potential access routes (for example, U.S. 93, 50, and 6) to the Proposed Action power plant site. Cumulative impacts on transportation would occur if other large reasonably foreseeable projects, such as the Ely Energy Center Project, were constructed during the same time period and in the vicinity of the Station. Construction of the Ely Energy Center is scheduled to begin in 2008, with the first unit to become operational in 2011 followed by the second unit within the next 3 years. Construction of the Station is scheduled to begin in 2007 and continue over the next 4 to 5 years depending on number of units constructed and construction scenario. Scheduled construction periods of the White Pine Energy Station and Ely Energy Center Projects overlap and would result in cumulative impacts on transportation.

The degree and location of potential cumulative impact during construction would depend on whether the Ely Energy Center is constructed approximately 50 miles north (Ely alternative site) or 50 miles south (Ely Proposed Action site) of the White Pine Energy Station Proposed Action site and how many workers travel the same access routes to the construction sites.

4.19.4.10.2 Alternative 1

Potential cumulative effects on transportation under Alternative 1 would be similar to those described for the Proposed Action. Scheduled construction periods for the White Pine Energy Station and Ely Energy Center Projects would overlap the same as described for the Proposed Action. The degree and location of potential cumulative impact during construction would depend on whether the Ely Energy Center is constructed 90 miles north (Ely alternative site) or 10 miles south (Ely Proposed Action site) of the White Pine Energy Station Alternative 1 site and how many workers travel the same access routes to the construction sites.

4.20 Unavoidable Adverse Impacts

Unavoidable adverse impacts are residual impacts after implementation of mitigation measures. Those unavoidable adverse impacts associated with the White Pine Energy Station that would remain after mitigation are summarized in the following text. Potential impacts for the Proposed Action and Alternative 1 are the same unless otherwise noted.

4.20.1 Geology, Soils, and Minerals

Some soils would be removed, covered, or compacted during the construction of Station features and lost from production. Biological soils crusts have not been documented to occur in the Station area. Under the Proposed Action, approximately 1,902 acres of soils would be temporarily disturbed during Station construction, approximately 392 acres would be reclaimed, and approximately 1,510 acres of soils would be permanently disturbed. Under Alternative 1, approximately 1,946 acres of soils would be temporarily disturbed during Station construction, approximately 377 acres would be reclaimed, and approximately 1,569 acres of soils would be permanently disturbed. No unavoidable adverse impacts on geological and mineral resources would occur.

4.20.2 Surface Water Resources

No unavoidable adverse impacts on surface water quality or the hydrology of streams and creeks would occur, and the potential to cause flooding would be very low. Unavoidable adverse effects on springs as affected by ground water interaction are discussed in Section 4.20.3, *Ground Water Resources.*

4.20.3 Ground Water Resources

The proposed Station would not result in a substantial decline in ground water levels or a substantial depletion of ground water resources in Steptoe Valley, and it would not impact ground water quality. The anticipated amount of ground water level decline is within the range of historical ground water level fluctuation observed in wells in Steptoe Valley. However, under the Proposed Action, pumping ground water from basin-fill aquifers in Steptoe Valley could result in localized ground water level declines between 2 and 6 feet in 12 nearby areas where springs are present on the floor of Steptoe Valley. Results of a ground water monitoring program will be used to determine if there are unanticipated effects from Station pumping on ground water levels or in flow rates and water levels of nearby springs. If the monitoring program indicates that the White Pine Energy Station ground water pumping is actually affecting spring flow rates and water levels, and therefore may potentially affect sensitive species present in those springs, WPEA will modify their pumping strategy in the well field to mitigate the potential for impacts. No unavoidable adverse effects on springs were identified for Alternative 1.

4.20.4 Biological Resources

The Proposed Action and Alternative 1 would disturb wildlife habitat and vegetative cover used by a variety of wildlife species. Under the Proposed Action, 395 acres of habitat would be temporarily disturbed by Station construction and 1,516 acres of habitat would be permanently disturbed by Station operations. The power plant ROW that the BLM would subsequently sell to WPEA would make up 1,281 acres of the permanently disturbed habitat under the

Proposed Action. Under Alternative 1, 378 acres of habitat would be temporarily disturbed and 1,534 acres of habitat would be permanently disturbed. The power plant ROW would make up 1,330 acres of the permanently disturbed habitat under Alternative 1. The loss of habitat under both the Proposed Action and Alternative 1 would be partially offset by the 700 to 900 acre Moriah Ranches Seeding Project. The Moriah Ranches Seeding Project would be implemented to enhance wildlife value on 700 to 900 acres of public land in the Ely BLM District.

Some residual unavoidable adverse effects on wildlife would potentially occur, including mortalities of unprotected reptile and small mammal species. Potentially reduced flows and water levels at 12 areas where springs are present near the Proposed Action power plant site from ground water pumping may adversely affect one species of special status aquatic springsnail (the Northern Steptoe Springsnail) and possibly other wildlife and plant species associated with spring environments. Section 4.20.3, *Ground Water Resources*, summarized monitoring and mitigation that will be implemented to avoid or minimize impacts to sensitive species in and around springs. Other possible Station-related effects on biological resources include the potential spread of noxious and invasive weeds. There also is the potential to affect special status species because of loss of habitat. The Station "may affect but is not likely to adversely affect" bald eagles.

4.20.5 Air Quality and Noise

Minimal air quality impacts would occur during Station construction. The primary issue would be fugitive dust, which would be controlled by water spray on disturbed areas. Emissions during Station operations would meet PSD permit requirements, including a modeled demonstration that all "Class II area" ambient impacts would be within applicable ambient air quality standards and that PSD increment (a measure of change in air quality) would not be exceeded. The dispersion modeling shows that "Class I area" impacts would be within applicable ambient air quality standards except that some potential exceedances of visibility criteria may occur in Jarbidge Wilderness Area and Zion National Park. While Great Basin National Park and Ruby Lake National Wildlife Refuge are not PSD Class I areas, the dispersion modeling also demonstrates that acid deposition and visibility criteria may be exceeded in these locations if managed to Class I standards.

No unavoidable adverse noise impacts would occur except for the short-term effects from steam blowouts during Station construction.

4.20.6 Visual Resources

Unavoidable adverse impacts would include the presence of construction vehicles, equipment, personnel, and activities, and associated fugitive dust emissions during construction. The constructed Station power plant, particularly the stacks and cooling towers, and transmission towers would be visible from much of Steptoe Valley. However, all Station features would meet VRM class objectives except for one location for both the Proposed Action and Alternative 1.

4.20.7 Recreation Resources

No unavoidable adverse impacts on recreation resources would occur. There would be a minor effect from the power plant site being unavailable for recreation. The increase in number of workers during Station construction and operation would increase the use of recreation resources in the Station project area. However, these increases are not considered adverse impacts.

4.20.8 Land Use

Unavoidable adverse impacts on land use include transferring a 1,281-acre parcel under the Proposed Action or a 1,330-acre parcel under Alternative 1 from public to private ownership. This land has been identified for disposal by the BLM but transferal would preclude the continuation of existing land uses (some recreation, grazing) on the fenced site. All other Station facilities would be on BLM-administered land and would comply with federal and local land use policies. Proposed Station ROWs would be shared with some other ROW holders.

4.20.9 Rangeland Resources

No unavoidable adverse impacts on rangeland resources, including livestock grazing and wild horses, would occur.

4.20.10 Wilderness and Areas of Critical Environmental Concern

No unavoidable adverse impacts on Wilderness or ACECs would occur. Station-related effects would be temporary and minor.

4.20.11 Wastes, Hazardous and Solid

No unavoidable adverse impacts from hazardous or solid wastes would occur. The Station would result in a solid waste disposal area being constructed and operated at the power plant site and would be permanently located there. Some hazardous materials would be stored on the power plant site.

4.20.12 Cultural and Historical Resources

No known direct unavoidable adverse impacts on cultural or historical resources would occur. Potential indirect unavoidable impacts on these resources could result from increased human activity in the area. Unavoidable adverse visual impacts of Station features on the historic integrity of the NNR, Magnuson Ranch rest stop, Whiteman Ranch, and Lincoln Highway could be minimized but not entirely mitigated.

4.20.13 Native American Religious Concerns

No unavoidable adverse impacts on Native American religious practices or traditional cultural properties would occur.

4.20.14 Environmental Justice

No unavoidable adverse impacts on minority or low-income populations would occur.

4.20.15 Paleontological Resources

No unavoidable adverse impacts on paleontological resources would occur.

4.20.16 Socioeconomics

Unavoidable adverse impacts resulting from the proposed Station would include induced mostly short-term population growth into the region, and some long-term population growth, thereby creating additional demand for public services and other community-based infrastructure and resources. Local infrastructure would be stressed during construction but Station construction commitments would prevent most impacts. Economic benefits would result from Station construction and operation.

4.20.17 Transportation

Unavoidable adverse impacts on transportation would include traffic increases on U.S. 93 during Station construction, but the increases would not reduce the Level of Service (LOS) class. The NNR would be upgraded to Class 3 status and accommodate 12 coal trains to and from the power plant per week.

4.21 Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

4.21.1 Introduction

For purposes of this discussion, "short-term" is defined as the approximate 4 to 6 years during Station construction and shortly thereafter during initial Station operation. "Long-term" is defined as the commercial life of the Proposed Action or Alternative 1, which is estimated to be 40 years or longer. At the end of this period, decisions would be made regarding continuing to use the property for electric generation purposes or another industrial use. Implementation of the Proposed Action or Alternative 1 would necessitate uses of the environment whose effects would be apparent during Station construction and operation, and which would result in both beneficial and adverse effects on long-term productivity.

Potential impacts associated with implementation of the Proposed Action or Alternative 1 are discussed in Sections 4.1 through 4.18 of this document. Section 4.19 discusses cumulative impacts associated with the Proposed Action or Alternative 1 when combined with proposed and/or anticipated projects. Unavoidable adverse impacts resulting from Station construction and operation that would remain after implementation of mitigation measures are described in Section 4.20 of this document. Many of the potential impacts described in Sections 4.1 through 4.18 are either temporary in nature, not substantial in magnitude, or they would be mitigated to prevent the occurrence of unavoidable adverse effects. These use-related effects are briefly summarized in the following text, as are the effects on long-term productivity.

4.21.2 Short-Term Uses

Most impacts on environmental resources would initially result from construction activities and be temporary in duration, but others would persist for the operational life of the Station. The range of these effects includes the following:

- Transferal and change in land use of a 1,281-acre parcel under the Proposed Action or a 1,330-acre parcel under Alternative 1 from public (BLM) to private (WPEA) ownership.
- Use of local soils and commitment of habitat during Station construction and operation
- Increased erosion potential until disturbed areas are reclaimed
- Use of ground water during Station construction and operation and potential localized effects on nearby springs under the Proposed Action
- Temporary disturbance and/or loss of habitat and/or vegetative cover used by numerous terrestrial and several aquatic species of wildlife; the federally-listed threatened bald eagle; various BLM and State of Nevada sensitive and protected wildlife, fish, and plant species; recreationists; wild horses; and livestock
- Visual impacts on several key observation points and historical resources from the presence of cooling towers and power plant components.

Construction and operation of the Proposed Action would result in the temporary disturbance of 1,902 acres and the permanent loss of 1,510 acres.

Construction and operation of Alternative 1 would result in the temporary disturbance of 1,946 acres and the permanent loss of 1,569 acres. Up to 5,000 acre-feet per year of ground water from the Steptoe Valley wellfield would be necessary to operate the White Pine Energy Station under the Proposed Action or Alternative 1.

Additional effects would result from short-term uses of the environment. Effects on air quality would primarily be short-term and localized, resulting from construction activities that create fugitive dust and vehicle and equipment engine emissions. Station construction and operation activities would impact the area's visual resources and ambient noise levels, but not substantially (except at several visual viewpoints as discussed previously) and not at levels that would affect recreationists' use and enjoyment of the Station project area or adjacent lands. Any cultural or paleontological resources encountered during construction activities could be degraded or destroyed, unless they are fully mitigated as described in this document. Local and regional economies would benefit from the construction and operation of the proposed White Pine Energy Station, especially in White Pine County because of increases in tax receipts resulting from the proposed Station. No long-term adverse effects would result from transportation-related activities. There would be no effects on geologic features, minerals, Wilderness or ACECs, Native American religious concerns, environmental justice, or hazardous and solid wastes.

4.21.3 Maintenance and Enhancement of Long-Term Productivity

Long-term productivity related to the Proposed Action or Alternative 1 includes long-term increases in the regional supply of reliable, electrical power at competitive costs for use by consumers to help meet shortages in the western United States. On a more local level, this includes an increased availability of electrical power for the State of Nevada. The Proposed Action or Alternative 1 would help meet short-term and long-term power requirements of existing regional population areas, both for residential and commercial/industrial uses. The direct and indirect economic benefits of Station construction and operation and of increased power production would support or contribute directly to the long-term economic growth, both locally and regionally, and particularly in White Pine County.

Conversion to private ownership of public land in White Pine County on which the Station power plant would be located, and the construction of associated Station facilities including the wellfield and linear infrastructure on public land, would result in increased long-term power production. This land sale would require short-term uses of the environment and affect the long-term productivity of several resources as summarized in Section 4.21.2.

4.22 Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources occurs if the commitment cannot be changed once made. An irretrievable commitment of resources occurs when resources are used, consumed, destroyed, or degraded during Station construction, operation, and maintenance and cannot be reused or recovered for the life of the Station or beyond. Table 4.22-1 summarizes irreversible and irretrievable commitments of resources for the Proposed Action or Alternative 1. Determinations of whether or not there would be irreversible and irretrievable commitments of environmental resources were based on discussions of direct and indirect Station effects in Sections 4.1 through 4.18 of this document and discussions of cumulative Station effects in Section 4.19. As summarized in Section 4.20, few of those effects would result in unavoidable adverse impacts on environmental resources.

TABLE 4-22-1

Irreversible and Irretrievable Commitments of Resources

Resource	Irreversible Commitment?	Irretrievable Commitment?*	Nature of Commitment
Geology	No	No	
Soils	Yes	Yes	See *Construction materials and fuels* below
Minerals	No	No	
Surface water	No	No	
Ground water	No	Yes	Used in construction, plant processes, and cooling operations
Vegetation	No	Project life span	Disturbance and/or loss of vegetation and habitat
Noxious and invasive weeds	No	Project life span	Potential for weed introduction and spread
Wildlife and fisheries	No	Project life span	Some harassment and/or loss of wildlife species and habitat
Threatened, endangered, candidate and sensitive species	No	Project life span	Some harassment and/or loss of special status species and habitat
Air quality	No	Project life span	Some minor degradation of air quality during construction and operation
Noise	No	Project life span	Noise sometimes exceeds ambient levels during construction and operation at a relatively minor level
Visual resources	No	Project life span	Viewshed intrusion from cooling towers and power plant components at several locations
Recreation resources	No	Project life span	Power plant construction and operation eliminate recreation use at site.

TABLE 4-22-1

Irreversible and Irretrievable Commitments of Resources

Resource	Irreversible Commitment?	Irretrievable Commitment?*	Nature of Commitment
Land use	No	Project life span	Transferal and change in land use of 1,289 acres under the Proposed Action or 1,333 acres under Alternative 1 from public to private ownership
Rangeland resources	No	No	
Wilderness and Areas of Critical Environmental Concern	No	No	
Hazardous and solid wastes	No	No	
Cultural and historical resources	Yes	Yes	Potential disturbance if sites are inadvertently discovered during construction or from increased human activity; visual impacts of cooling towers and power plant components on the historic integrity of the NNR, Magnuson Ranch rest stop, and Lincoln Highway
Native American religious concerns	No	No	
Environmental justice	No	No	
Paleontological resources	No	No	
Socioeconomics	No	Project life span	Increased regional and local employment and revenues during construction and operation
Transportation	No	No	
Construction materials and fuels			
Sands and gravels	Yes	Yes	
Ground water	Yes	Yes	
Steel	Yes	Project life span	
Aluminum	Yes	Project life span	
Concrete	Yes	Yes	
Chemicals	Yes	Yes	
Wood	Yes	Project life span	
Petroleum products	Yes	Yes	
Coal	Yes	Yes	

*Notes:
"Project life span" indicates an irretrievable impact would extend through project construction and operation. "Yes" indicates impact duration would be forever.

4.23 Energy Requirements and Conservation Potential

Energy requirements under the Proposed Action or Alternative 1 for Station construction, operation, and maintenance activities would include the use of the following:

- Petroleum products (diesel, gasoline, oil, and grease)
- Various building, operations, and maintenance materials such as aggregate from borrow areas, water from the Steptoe Valley wellfield, steel, aluminum, concrete, and wood

Other energy requirements would include the use of coal from the Powder River Basin, Wyoming, for fueling the steam turbine generators, and the use of various chemicals for treating power plant condensate and circulating water. These basic energy requirements cannot be determined specifically for the Proposed Action or Alternative 1 because of the variability of potential actions. The Proposed Action and Alternative 1 would be expected to have generally similar energy requirements, overall. The Proposed Action transmission lines and water supply pipeline would be slightly longer than those for Alternative 1, but the more southern location of the Alternative 1 power plant would require greater NNR travel distances to haul coal to the Alternative 1 site than to the Proposed Action site. The No Action Alternative would have no Station-related energy requirements.

Chapter 5.0 Consultation and Coordination

5.1 Introduction

National Environmental Policy Act regulations provided by the Council on Environmental Quality require the involvement of agencies and the general public during the preparation of Environmental Impact Statements. This chapter documents coordination and consultation that has occurred with federal, state, and local agencies, Native Americans, and the public during scoping for the proposed project and in the preparation of this DEIS.

5.2 Public Scoping

Public scoping meetings for the White Pine Energy Station Project were held in Ely on August 23, 2004, and in Reno on August 24, 2004. Meeting objectives were to learn the concerns of individuals, organizations, and agencies regarding the proposed project and to allow interested parties to participate in developing a list of issues to be addressed in the EIS.

The meetings were publicized through newspaper advertisements and individual mailings. On August 13 and August 20, 2004, advertisements were published in the *Ely Times* and the *Reno Gazette-Journal*. Mailings were sent to 210 addresses. The meetings were conducted using an open-house format. At each meeting, WPEA, EIS contractor, and BLM representatives presented project information on display boards and handouts, and discussed concerns with individuals. The Ely meeting was attended by 42 individuals, and the Reno meeting was attended by 11 individuals.

Individuals, public agencies, and non-profit organizations submitted written comments to the BLM after the meetings. Thirty-five letters were received. Most commentors expressed concerns regarding potential impacts of the proposed power plant on local resources and suggested questions that should be answered in the EIS. The number of comments provided in each resource category was as follows (from highest number of comments to lowest):

- Air quality (44 comments)
- Water development, use, and ground water impacts (41 comments)
- Wildlife, habitat, and ecological concerns (33 comments)
- Transmission (15 comments)
- Socioeconomics (13 comments)
- Visual resources (13 comments)
- Transportation, roads, and railroad (12 comments)
- Power need and recipients (10 comments)
- Proposed site and alternatives (10 comments)
- Energy efficiency, conservation, and alternative energy (7 comments)
- Waste and hazardous materials (9 comments)
- Power plant technology (6 comments)
- Noise (6 comments)
- Recreation (2 comments)
- Other (10 comments)

5.3 Coordination During DEIS Development

5.3.1 General Consultation

The federal, state, and county agencies, and Native American Tribes listed below were consulted during the preparation of this DEIS.

- Federal
  - U.S. Army Corps of Engineers—Sacramento, California
  - Bureau of Indian Affairs—Elko, Nevada
  - Bureau of Land Management—Elko and Las Vegas Field Offices, Nevada
  - National Park Service—Great Basin National Park, Nevada
  - National Park Service—Intermountain Region, Denver, Colorado
  - National Park Service—National Trails System, Salt Lake City, Utah
  - Natural Resources Conservation Service—Elko, Nevada
  - U.S. Fish and Wildlife Service—Reno, Nevada
  - U.S. Forest Service—Humboldt Toiyabe National Forest, Nevada
  - U.S. Air Force, Hill Air Force Base, Utah
- State
  - Nevada Department of Wildlife
  - Nevada Department of Conservation and Natural Resources
  - Nevada Division of Environmental Protection
  - Nevada Division of Forestry
  - Nevada Division of State Lands
  - Nevada Division of State Parks
  - Nevada Division of Water Resources
  - Nevada Governor's Office
  - Nevada Public Utilities Commission
  - Nevada Office of Historic Preservation
- County
  - White Pine County Commission
  - White Pine County Economic Diversification Council
- Native American Tribes
  - Duckwater Shoshone Tribe
  - Ely Shoshone Tribe

5.3.2 Native American Consultation

BLM representatives initiated formal and informal communication with Native American Tribal representatives in the project area to discuss the proposed White Pine Energy Station Project. This process has provided Tribes the opportunity to identify potential effects of the project on Native American interests. A Native American coordination meeting was conducted on December 8, 2004, in the BLM Ely Field Office with representatives from the Ely Shoshone Tribe, Duckwater Shoshone Tribe, WPEA, and the Ely Field Office. Project details were presented to the group by WPEA, followed by a discussion of issues and concerns. Subsequent to the meeting in December, BLM Ely Field Office staff have remained in communication with the Tribes regarding the project. The most recent meeting with the Tribes was in July 2006. Another meeting with the Tribes is anticipated to coincide with the release of this DEIS to the public for review and comment. To date, no issues or concerns have been raised by the Tribes regarding any religious or traditional cultural properties.

5.4 List of Agencies, Organizations, and Persons to Whom Copies of the DEIS were Sent

5.4.1 Distribution

Through the consultation and coordination process, interested parties can review and comment on the substantive issues presented in the DEIS. This DEIS was sent to, and comments requested from, members of the public and other individuals who attended public meetings. It also was sent to the entities listed below.

5.4.1.1 Federal Government

Bureau of Indian Affairs
Bureau of Land Management, Ely Field Office
Bureau of Land Management, Nevada State Office
National Park Service
Natural Resources Conservation Service
U.S. Air Force
U.S. Army Corps of Engineers
U.S. Department of Agriculture
U.S. Department of Energy
U.S. Department of the Interior
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Geological Survey

5.4.1.2 State Government

Nevada Commission for the Preservation of Wild Horses
Nevada Department of Agriculture
Nevada Department of Transportation
Nevada Division of Budget and Planning
Nevada Division of Energy
Nevada Division of Environmental Protection
Nevada Division of Livestock Identification
Nevada Division of Minerals
Nevada Division of State Lands
Nevada Division of State Parks
Nevada Division of Water Resources
Nevada Department of Wildlife
Nevada Grazing Advisory Board
Nevada Legislative Committee on Public Lands
Nevada Natural Heritage Program
Nevada Office of the Governor
Nevada Public Utilities Commission
Nevada State Clearinghouse
Nevada State Historic Preservation Office
Nevada Wildlife Commission

5.4.1.3 Local Governments

Baker Area Citizen Advisory Board
City of Cherry Creek
City of Ely
White Pine Conservation District
White Pine County Chamber of Commerce
White Pine County Commission
White Pine County Economic Diversification Council
White Pine County Extension Service
White Pine County Public Land Users Advisory Committee
White Pine County Road Department
White Pine County Schools
White Pine County Wildlife Advisory Board

5.4.1.4 Tribal Governments

Confederated Tribes of the Goshute Reservation
Duckwater Shoshone Tribe
Ely Shoshone Tribe
Kanosh Band of Paiutes
Moapa Band of Paiutes
Paiute Indian Tribe of Utah
South Fork Band Council, Te-Moak Tribe of Western Shoshone
Wells Band Council of Western Shoshone
Yomba Shoshone Tribe

5.4.1.5 Other Organizations

American Horse Protection Association
Center for Biological Diversity
Clean Air Coalition
Committee for Idaho's High Desert
Friends of Nevada Wilderness
Friends of the Nevada Northern Railway
Idaho Power Company
International Society for the Protection of Mustangs and Burros
Mount Wheeler Power, Inc.
National Mustang Association
National Wild Horse Association
Nevada Farm Bureau Federation
Nevada Historical Society
Nevada Wilderness Project
Nevada Wildlife Federation
Quadra Mining Company
Robinson Nevada Mining Company
Rocky Mountain Elk Foundation
Sierra Club
Sierra Pacific Power Company
Southern Nevada Water Authority
The Nature Conservancy
Western Watersheds Project
White Pine Historical Society
Wild Horse Organized Assistance
Wild Horse Preservation League
Wild Horse Wilderness and Wildlife
Wilderness Society
Wildlife Society

5.4.1.6 Government Officials

Nevada Governor Jim Gibbons
John Ensign, U.S. Senate
Jon Porter, U.S. House of Representatives
Harry M. Reid, U.S. Senate
Shelly Berkley, U.S. House of Representatives
Dean Heller, U.S. House of Representatives

5.4.2 Availability

Copies of the White Pine Energy Station Project DEIS will be available for public inspection at the BLM offices listed below.

Bureau of Land Management
Ely Field Office
702 North Industrial Way
Ely, NV 89301-9408

Bureau of Land Management
Elko Field Office
3900 Idaho Street
Elko, NV 89801

Bureau of Land Management
Carson City Field Office
5665 Morgan Mill Road
Carson City, NV 89701

Bureau of Land Management
Nevada State Office
1340 Financial Boulevard
Reno, NV 89502-7147

Bureau of Land Management
Washington Office of Public Affairs
18th and C Street, N.W.
Washington, D. C. 20240

Copies of the White Pine Energy Station Project DEIS will be available for public inspection at the libraries listed below.

University of Nevada-Reno, Getchell Library, Government Publication Dept.
Reno, NV 89507

Washoe County Library
301 South Center Street
Reno, NV 89501

White Pine County Library
950 Campton Street
Ely, NV 89301

5.5 Public Meetings

Two public meetings will be held to receive comments on the DEIS. Dates and locations of these meetings are as follows:

- May 8, 2007, Ely, Nevada
- May 9, 2007, Reno, Nevada

5.6 List of Preparers and Reviewers

An EIS Interdisciplinary Team was formed by the lead agency (the BLM) to provide guidance and direction for preparing the EIS. Table 5-1 lists the EIS Interdisciplinary Team members, their organization, and role.

An EIS Core Team was formed to review interim work products to EIS preparation, work through specific issues related to EIS preparation, and review the EIS. Table 5-2 lists the EIS Core Team members and their organization.

Table 5-3 lists the EIS Consultant Team members, and their organization and role, who were responsible for preparing this DEIS.

TABLE 5-1
EIS Interdisciplinary Team

Organization	Team Member	Role
Bureau of Land Management	Mike Baughman (Intertech Services)	EIS Coordinator
	Susan Baughman	Co-Project Lead/NEPA
	Doris Metcalf	Co-Project Lead/Lands
	Jared Bybee	Wild Horse Specialist
	Jeff Brower	Hydrologist
	John Longinetti	Range, Livestock, and Noxious Weed Specialist
	Brad Pendley	Wildlife Biology Specialist
	Dan Netcher	Geologist/Environmental Protection Specialist
	Nathan Thomas	Archaeology Specialist
	Bruce Winslow	Recreation, Wilderness, VRM Specialist
Forest Service	Bud Rolotson	Air Quality
National Park Service	Liana Reilly	Air Quality
	John Notar	Air Quality
	Lee Kreutzer	National Trails System
WPEA	Eric Crawford	Proponent
	Lawrence Willick	Proponent
	Robert Colozza	Proponent
CH2M HILL	Tom Haislip	EIS Project Manager
EDAW	Joan DeGraff	EIS Assistant Project Manager

TABLE 5-2

EIS Core Team

Organization	Team Member
Bureau of Land Management	Jack Tribble Jeff Weeks Doris Metcalf Susan Baughman Sarah McCall Rhonda Karges Mike Baughman
Nevada Department of Wildlife	Steve Foree
National Park Service	Ben Roberts
White Pine County	Karen Rajala Gary Perea
WPEA	Eric Crawford Lawrence Willick Robert Colozza
CH2M HILL (Contractor)	Tom Haislip
EDAW (Contractor)	Joan DeGraff

TABLE 5-3

EIS Consultant Team

Organization	Team Member	Role
CH2M HILL	Tom Haislip	EIS Project Manager
	Lynn Foster	EIS Preparation Task Lead
	Doug Huxley	Air Emissions Task Lead
	Frank Lewis	Water Resources Task Lead
	Gary Brown	Engineering Liaison
	Mark Greenig	Visual Resources Task Lead
	Wendy Haydon	Transportation Task Lead
	Wing Ko	Noise Task Lead
	Amy Lang	Hazardous and Solid Wastes Task Lead
	Eric Oden	Project Editor
EDAW	Joan DeGraff	EIS Assistant Project Manager and Cultural Resources Task Lead
	Mark Greenig	Visual Resources Task Lead
	Ron Tressler	Biological Resources Task Lead
	Steve Pavich	Socioeconomics Task Lead
	Bruce Meighan	Land Use Task Lead
	Drew Stoll	Recreation Task Lead
	Jennifer Chester	GIS Task Lead

Chapter 6.0 References

Abrams, L. 1981. *Illustrated Flora of the Pacific States*. Volumes I, II, III and IV. Stanford University Press, Stanford, California.

Aikens, Melvin and David B Madsen. 1986. "Prehistory of the Eastern Area." In: Great Basin; Warren L. d'Azevedo (ed.), pp. 149-160. *Handbook of North American Indians*, Vol. 11, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Allouche, Cowan and Gilchrist. 2003. *Prediction and Mitigation of Construction Noise in an Urban Environment.* Can. J. Civ. Eng. 30:659-672.

Applied Analysis. 2005. *Fiscal Impact Analysis prepared for the White Pine Energy Station.*

Avian Power Line Interaction Committee. 1996. *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996.* Edison Electric Institute and the Raptor Research Foundation, Washington D.C.

Avian Power Line Interaction Committee. 2006. *Suggested Practices for Avian Protection on Powerlines: The State of the Art in 2006.* Edison Electric Institute, APLIC, and the California Energy Commission. Washington D.C. and Sacramento, California.

Bailey, L.R. 1966. *Indian Slave Trade in the Southwest.* Western Lore Press, Los Angeles, California.

Barbour, R.W. and W.D. Davis. 1969. *Bats of America.* The University of Kentucky Press.

Bureau of Economic Analysis. See U.S. Department of Commerce, Bureau of Economic Analysis.

Beck. K.G. 1999. "Biennial Thistles." Pp. 145-161 In: R.L. Sheley and J.K. Petroff, eds., *Biology and Management of Noxious Rangeland Weeds*. Oregon State University Press, Corvallis, Oregon. 438 pp.

Bedinger, M.S. J.R. Harrill, W.H. Langer, J.M. Thomas, and D.A. Mulvihill. *1984. Maps Showing Ground-Water Levels, Springs, and Depth to Water, Basin and Range Province.* U.S. Geological Survey Water Resources Investigation Report 83-4119-B.

Bengston Ginny. 2003. "Northern Paiute and Western Shoshone Land Use in Northern Nevada: A Class I Ethnographic/Ethnohistoric Overview." *Cultural Resource Series No. 12.* U.S. Department of the Interior, Bureau of Land Management, Nevada.

Beranek and Ver. 1992. *Noise and Vibration Control Engineering – Principles and Applications.* John Wiley & Sons, Inc.

Bishop, Robert. 2007. Personal communications with Robert Bishop, White Pine County Assessor, and Karen Rajala of WPCEDC.

BLM. See U.S. Bureau of Land Management

Blomquist, Glenn. 1974. *The Effect of Electric Utility Power Plant Location on Area Property Value.* Land Economics, Vol. 50, No. 1 (Feb., 1974), pp. 97-100

Bolt, B.A. 1993. *Earthquakes and Geological Discovery. Scientific American Library.* W.H. Freeman, New York, 229 pp.

Bowers, Martha H. and Hans Muessig. 1982. *History of Central Nevada: An Overview of the Battle Mountain District.* Bureau of Land Management, Nevada Cultural Resource Series No. 4. Reno, Nevada.

Boyle, Melissa A. and Katherine A. Kiel. 2001. "A Survey of House Price Hedonic Studies of the Impact of Environmental Externalities." *Journal of Real Estate Literature.* Pgs. 117-144.

Braun, C.E. 1998. "Sage Grouse Declines in Western North America: What Are the Problems?" *Proceedings of the Western Association of State Fish and Wildlife Agencies.* 78:139-156.

Braun, C.E., M.F. Baker, R.L. Eng, J.S. Gashwiler, and M.H. Schroeder. 1976. *Conservation Committee Report on Effects of Alteration of Sagebrush Communities on the Associated Avifauna.* Wilson Bulletin 88:165-171.

Britten, H.B., P.F. Brussardl, and D.D. Murphy. 1992. "A Reconsideration of the Taxonomic Status of *Euphydryas editha koreti* (Lepidoptera: Nymphalidae) from the Central Great Basin." *Journal of Research on the Lepidoptera* 31(3-4):278-286.

Brooks, Richard H. Daniel O. Larson, Joseph King, Robert Leavitt, and Kathryne Olson. 1977. "The Archaeology of the Mariah Site 26LN618, White River Narrows, Lincoln County, Nevada." Unpublished Ms., Nevada Archaeological Survey, University of Nevada at Las Vegas.

Bryan, Alan L. 1979. "Smith Creek Cave." In: *The Archeology of Smoth Creek Canyon, Eastern Nevada.* Donald R. Tuohy and Doris L. Rendall (eds.). *Nevada State Museum Anthropological Papers 17*:162-251.

Bunting, Stephen C. 1990. "Prescribed Fire Effects in Sagebrush-Grasslands and Pinyon-Juniper Woodlands." In: Alexander, M. E.; Bisgrove, G. F., Technical Coordinator. *The Art and Science of Fire Management: Proceedings of the 1st Interior West Fire Council Annual Meeting and Workshop*; 1988 October 24-27; Kananaskis Village, AB. Information Rep. NOR-X-309. Edmonton, AB: Forestry Canada, Northwest Region, Northern Forestry Centre: 176-181. [15519].

Bureau of Economic Analysis. See U.S. Department of Commerce, Bureau of Economic Analysis.

Bybee, Jared (NDOW). 2005. Telephone conversation with Jeff Walker (EDAW). May 24.

Caldwell Richards Sorensen and Mountain States Contracting. 2005. *White Pine Energy Associates, LLC 115 Mile Rehabilitation Study of the Nevada Northern Railway Rehabilitation Plan.* August 25.

California Air Resources Board. 1997. *Emission Inventory Procedural Manual.*

California Department of Transportation. 1998. *Technical Noise Supplement (TeNS).* October.

CH2M HILL. 2004. Alternative Evaluation Study. Prepared for Dairyland Power Cooperative. January.

Coordinated Implementation Plan for Bird Conservation in Nevada

City-data. 2005. City-data.com website. http://www.city-data.com/. Accessed May 12.

Clark, W. O. and C.W. Riddell. 1920. *Exploratory Drilling for Water and Use of Ground Water for Irrigation in Steptoe Valley, Nevada.* U.S. Geological Survey Water Supply Paper 467.

Clark, D.C. and L.A. Nieves. 1994. *An Interregional Hedonic Analysis of Noxious Facility Impacts on Local Wages and Property Values.* The Journal of Environmental Economics and Management 27(3):235-53.

Connelly, J.W., K.P. Reese, and M.A. Schroeder. 2003. *Monitoring of Greater Sage Grouse Habitats and Populations.* Station Bulletin 80. College of Natural Resources, University of Idaho, Moscow, Idaho.

Connelly, J. W., S T. Knick, M. A. Schroeder, and S. J. Stiver. 2004. Conservation Assessment of Greater Sage grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies (unpublished report). Cheyenne, Wyoming. 610 pp.

Connelly, J.W., W.L. Wakkin, A.D. Apa, and K.P. Reese. 1991. "Sage Grouse Use of Nest Sites in Southeastern Idaho." *Journal of Wildlife Management.* 55:521-524.

Council on Environmental Quality. 1993. *Incorporating Biodiversity Considerations into Environmental Impact Analysis Under the National Environmental Policy Act.* Washington D.C.

Cronquist, A., A.H. Holmgren, N.H. Holmgren, and J.L. Reveal. 1972. *Intermountain Flora: Vascular Plants of the Intermountain West, U.S.A.,* Volume 1. Hafner, New York, New York.

Cronquist, A., Holmgren, A., Holmgren, H.,Reveal, J. 1986-1997. *Intermountain Flora Vascular Plants of the Intermountain West, U.S.A.* Volumes 1, Three Parts A & B, Four, Five and Six. The New York Botanical Garden, Bronx, New York.

Crookshanks 2005. Various personal communication with Chris Crookshanks, Nevada Department of Wildlife, and D. Leiker or R. Tressler of EDAW.

CRS and MSC. See Caldwell Richards Sorensen and Mountain States Contracting.

David L. Evans and Associates. 2002. *Environmental Assessment for the Proposed Reinstatement of Rail Freight Operations on the Nevada Northern Railroad.* Prepared for the City of Ely, Nevada. San Ramon, California,

Day, Dean. 2007. Personal communications with Dean Day, City of Ely Engineer, and Karen Rajala of WPCEDC.

Dealy, J.E., D.A. Leckenby, and D.M. Concannon. 1981. *Wildlife Habitats in Managed Rangelands-The Great Basin of Southeastern Oregon: Plant Communities and Their Importance to Wildlife.* USDA Forest Service General Technical Report PNW-120.

Desert Research Institute. 2005. "*Evaluation of Existing and Future Air Quality Monitoring at Great Basin National Park.*"

DNR. See Nevada Department of Natural Resources.

DOE. See U.S. Department of Energy.

Dotson, Evan. 2007. Personal communications with Evan Dotson, City of Elko, and Karen Rajala of WPCEDC.

Drews, Michael, and Eric Ingbar. 2004. *Technical Report: Cultural Resources Analysis and Probability Model for the Bureau of Land Management, Ely District*. Submitted to ENSR International, 1601 Prospect Way, Fort Collins, Colorado, on file at the BLM Ely Field Office, Ely, Nevada.

Dunne, T. and L.B. Leopold. 1978. *Water in Environmental Planning.* W H Freeman & Co. New York, New York.

Eakin, T.E., J.L. Hughes, and D.O. Moore. 1967. *Water Resources Appraisal of Steptoe Valley, White Pine and Elko Counties, Nevada.* Water Resources Reconnaissance Series Report 42, Nevada Department of Conservation and Natural Resources, Carson City. 48 pp.

Eaton, G.P., 1982. "The Bain and Range Province: Origin and Tectonic Significance." In: *Annual Review of Earth and Planetary Science*, Wetherill, G.W., A.L., Albee, F.G. Stehli, Editors, Volume. 10, p. 409-440.

EDAW. 2005. GIS analysis based on data provided by BLM Ely and Elko, Nevada, Field Offices. March-April.

EDAW. 2006a. *Cultural Resource Investigations for the WPES Project, Volume I, Class I and Class III Inventory for the White Pine Energy Station Project, White Pine County, Nevada.* Prepared for White Pine Energy Associates, LLC, for presentation to BLM, Ely Field Office, EDAW, Sacramento.

EDAW. 2006b. *Cultural Resource Investigations for the WPES Project, Volume II, Assessment of Indirect Effects to Historic Resources for the White Pine Energy Station project, White Pine County, Nevada.* Prepared for White Pine Energy Associates, LLC, for presentation to BLM, Ely Field Office, EDAW, Sacramento.

EDAW GIS 2006c. GIS analysis conducted by EDAW, 2006.

Einarsen, A. S. 1948. *The Pronghorn Antelope and Its Management.* Wildl. Manage. Inst., Washington, DC. 235 pp.

Elliott, Russel R. 1987. *History of Nevada.* University of Nebraska Press, Lincoln.

Ellis, K. L., J. R. Murphy, and G. H. Richins. 1987. *Distribution of Breeding Male Sage Grouse in Northeastern Utah.* Western Birds 18:117-121.

Ellis, K.L. 1984. "Behavior of a Lekking Sage Grouse in Response to a Perched Golden Eagle." *West. Birds.* 15:37-38.

Elston, Robert G. 1986. Prehistory of the Western Area, in Great Basin, Volume II, pp. 135-148, edited by Warren L. d'Azevedo, in *Handbook of North American Indians*, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Elston, Robert G. and Kenneth Juell. 1987. "Archaeological Investigations at Panaca Summit." *Cultural Resources Series No. 10*. Nevada State Office, Bureau of Land Management, Reno.

Elston, Robert G., Jonathan O. Davis, and Robert Clerico. 1979. "Archaeological Site 26NY1908: A Late Pleistocene Gravel Bar in Railroad Valley, Nevada." Manuscript on file a the Nevada Bureau of Land Management, Ely District Office, Ely, Nevada.

Energy Information Administration. 2006. *Annual Energy Outlook 2006*. February. Chapter 1.

Facilitators, Inc. 1980. *MX/Native American Cultural and Socio-Economic Studies – Draft. Facilitators, Inc.,* Las Vegas, Nevada.

Farnworth, Jennifer. 2007. Administrative Secretary, White Pine County School District. 2007. Personal communication with Wendy Haydon/CH2M HILL on January 25, 2007.

Federal Emergency Management Agency. 1983. *Flood Insurance Study, City of Ely, Nevada, White Pine County.*

FEMA, See Federal Emergency Management Agency.

Foree, Steve. 2006. Conversation with Steve Foree, NDOW, and Diana Leiker, EDAW. February 7.

Forest Service. See U.S. Forest Service.

Fowler, Catherine S. 1980. "Food-Named Groups Among the Northern Paiute of the Great Basin of North America: An Ecological Interpretation." In *The Regulation Of Environmental Resources In Food-Collecting Societies*, American Association for the Advancement of Science, New York.

Fowler, Catherine S., and Sven Liljeblad. 1986. "Northern Paiute." In *Great Basin*, edited by Warren L. d'Azevedo, pp. 435-465. *Handbook of North American Indians, Vol. 11,* W.C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Fowler, Don D. 1968. "Archaeological Survey in Eastern Nevada." 1966. *University of Nevada Desert Research Institute Social Sciences and Humanities Publications* 2, Reno, Nevada.

Franzreb, K.E. and S.A. Laymon. 1993. "A Reassessment of the Taxonomic Status of the Yellow-billed Cuckoo." Western Birds 24:17-28.

Franzwa, Gregory M. 2004 *The Lincoln Highway, Nevada.* Patrice Press, Tucson, Arizona.

Frick, E.A, 1985. "Quantitative Analysis of Groundwater Flow in Valley-Fill Deposits in Steptoe Valley, Nevada." Unpublished Master's Thesis, University of Nevada, Reno.

FWS. See U.S. Fish and Wildlife Service.

Gaines, D. and S. A. Laymon. 1984. "Decline, Status, and Preservation of the Yellow-billed Cuckoo in California." *Western Birds.* 15:49-80.

Godfrey, Anthony. 1994. *Pony Express National Historic Trail, Historic Resource Study.* http://www.nps.gov/poex/hrs/ hrs.3b.htm. U.S. Department of the Interior, National Park Service. Accessed 10-27-2004.

Goetzmann, William H. 1966. *Exploration and Empire: The Explorer and Scientist in the Winning of the West.* Vintage Books, New York, New York.

Graul, W.D. 1980. "Grassland Management and Bird Communities." Pages 38-47 in R.M. DeGraff and N.G. Tilghman, compilers. Workshop Proceedings, Management of Western Forests and Grasslands for Nongame birds. U.S. Department of Agriculture, Forest Service General Technical Report INT-86.

Green, J. S. and J. T. Flinders. 1980. "Brachylagus Idahoensis." *Mammalian Species.* 125:1-4.

Gregg, M. A., J. A. Crawford, M. S. Drut, and A. K. DeLong. 1994. "Vegetational Cover and Predation of Sage Grouse Nests in Oregon." Journal of Wildlife Management 58:162-166.

Hafen, LeRoy. 1926. *The Overland Mail.* A.H. Clark, Cleveland, Ohio.

Hardman, G. and M.R. Miller. 1934. *The Quality of the Waters of Southeastern Nevada, Drainage Basins and Water Resources.* University of Nevada Agricultural Experiment Station, Bulletin 136, 62 pp.

Harris Miller Miller & Hanson, Inc. 2006. *Transit Noise and Vibration Impact Assessment.* Chapter 5, Tables 5-1 and 5-2. May.

Haskins, R.L. II. 1995. *Status and Distribution of Selected Populations of Relict Dace (Relictus solitarius) in White Pine County.* Nevada Department of Conservation and Natural Resources, Division of Wildlife. Elko. 6 pp.

Hawkwatch International, Inc. 2005. *Exploratory Raptor Migration Surveys At Sites Near Ely, Nevada With Significant Wind Power Generation Potential.* Report prepared by Hawkwatch International, Salt Lake City, Utah or the Nevada Department of Wildlife.

Heizer, Robert F., and Martin A. Baumhoff. 1962. *Prehistoric Rock Art of Nevada and Eastern California.* University of California Press, Berkeley, California.

Hershler, R. 1998. *A Systematic Review of the Hydrobiid snails (Gastropoda: Rissooidea) of the Great Basin, Western United States, Part I: Genus Pyrgulopsis.* Veliger, 41 (1): 1-132.

Hess, J.W., and M.D. Mifflin. 1978. *A Feasibility Study of Water Production from Deep Carbonate Aquifers in Nevada.* University of Nevada, Desert Research Institute Publication 41054.

Hill, Bunny. 2006. Personal communications with Bunny Hill, Director of the White Pine County Social Services Department, and Karen Rajala of WPCEDC.

Hill, James M. 1916. "Notes on Some Mining Districts in Eastern Nevada." *U.S. Geological Survey Bulletin* 648.

Hose, R. K., and M.C. Blake. 1976. Geologic map of White Pine County, Nevada, scale: 1:250,000, in *Geology and Mineral Resources of White Pine County, Nevada, Part I, Geology*. Nevada Bureau of Mines and Geology Bulletin 85, p. 1-35.

HR 6111. United States House of Representatives, House Resolution 6111-107. Title III—White Pine County Conservation, Recreation, And Development Act of 2006.

Hughes, J.M. 1999. Yellow-billed Cuckoo. *In* Poole and Gill eds. Birds of North America No. 418.

Hulse, James W. 1972. *The Nevada Adventure: A History*. University of Nevada Press, Reno, Nevada.

Hunt, C.B. *Physiography of the United States*. W.H. Freeman, San Francisco, California.

James, Steven R. (ed.). 1981. *Prehistory, Ethnohistory, and History of Eastern Nevada: A Cultural Resources Summary of the Elko and Ely Districts*. Cultural Resource Series No. 3, United States Department of the Interior, Bureau of Land Management, and the University of Utah Archaeological Center.

James, Steven R. and Charles D. Zeier. 1982. "Eastern Nevada Study Unit." In: *An Archaeological Element for the Nevada Historic Preservation Plan*, pp. 123-150. University of Nevada Las Vegas. Prepared for the Nevada Division of Historic Preservation and Archaeology.

Jennings, Jesse. 1986. "Prehistory: Introduction." In *Handbook of North American Indians Volume 11*. Great Basin. Edited by Warren L. d'Azevedo. smithsonian Institution, Washington.

Jones, George T., Charlotte Beck, Fred L. Nials, Joshua J. Neudorfer, Brian J. Borwnholtz, and Hallie B. Gilbert. 1996. "Recent Archaeological Investigations at the Sunshine Locality, Long Valley, Nevada." *Journal of California and Great Basin Anthropology* 18(1):48-63.

Jorgenson, Joseph G. 1986. Ghost Dance, Bear Dance, and Sun Dance. In *Great Basin: Volume 11*, edited by W.L. D'Azevedo, pp. 660-672, Handbook of North American Indians, Washington.

Kartesz, John T. 1983. *A Flora of Nevada*. Volumes 1-4. UMI Dissertation Services, Ann Arbor, Michigan.

Laymon, S.A. and M.D. Halterman. 1987. "Can the Western Subspecies of the Yellow-billed Cuckoo Be Saved from Extinction?" *Western Birds*. 18:19-25.

Leeds, Hill and Jewett, Inc. 1981. *Groundwater Investigation, Phase I, Technical Report for the White Pine Power Project*. San Francisco.

Leeds, Hill and Jewett, Inc. 1983. *Groundwater Investigation, Phase III, Technical Report for the White Pine Power Project*. San Francisco.

Leegard, David. 2006, 2007. Transportation Analyst II., Nevada Department of Transportation. Personal communication with Wendy Haydon/CH2M HILL on June 30, 2006, July 14, 2006, and January 16, 19, and 23, 2007.

Lincoln, Francis Church. 1923. *Mining Districts and Mineral Resources of Nevada*. Nevada Newsletter Publishing Company, Reno, Nevada.

Loeltz, O.J., and G.T. Malmberg. 1961. "The Ground-Water Situation in Nevada, 1960" *Nevada Department of Conservation and Natural Resources, Ground-water Information Series No. 1*. 20 pp.

Lopes, T.J., and D.M. Evetts, 2004. *Ground-Water Pumpage and Artificial Recharge Estimates for Calendar Year 2000 and Average Annual Natural Recharge and Interbasin Flow by Hydrographic Area, Nevada*. U.S. Geological Survey Scientific Investigations Report 2004-5239.

Lyman, R. L. 1991. "Late Quaternary Biogeography of the Pygmy Rabbit (*Brachylagus Idahoensis*)" in *Eastern Washington. J. Mamm*. 72:110-117.

Lyneis, Margaret. 1982. *An Archaeological Element for the Nevada Historic Preservation Plan*. University of Nevada Las Vegas. Prepared for the Nevada Division of Historic Preservation and Archaeology.

Mack, Effie Mona, and Byrd Wall Sawyer. 1965. *Here is Nevada: A History of the State*. Western Printing and Publishing Co., Reno, Nevada.

Madsen, David B. 1982. "Salvage Excavations at Ticaboo Town Ruin (42Ga2295)." In: Archaeological Investigations in Utah at Fish Springs, Clay Basin, Northern San Rafael, South Henry Mountains. *Utah Bureau of Land Management, Cultural Resource Series* 12. Salt Lake City, Utah.

Madsen, David B. and David Rhode. 1994. *Across the West, Human Population Movement and the Expansion f the Numa*. University of Utah Press, Salt Lake City.

Malouf, Carling J. and John Findlay. 1986. "Euro-American Impact Before 1870." Pp. 499-516. in *Great Basin*, Volume 11, edited by Warren d'Azevedo. *Handbook of North American Indians,* edited by William C. Sturtevant, Smithsonian Institution, Washington.

Manning, Jarene (Nevada Division of State Parks). 2005. Personal communication with Chad Schneckenburger (EDAW). May 23.

Marwitt, John P. 1986. "Fremont Culture." In: *Great Basin*. Warren L. d'Azevedo (ed.), pp 161-172. *Handbook of North American Indians*, Volume 11. William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

McIntosh, Caroline. 2007. Assistant Superintendent. White Pine County School District. 2007. Personal communication with Wendy Haydon/CH2M HILL on January 25.

Mifflin, J.D., 1968. *Delineation of Groundwater Flow Systems in Nevada*. University of Nevada, Desert Research Institute Technical Report H-W4.

Miller, Laymon N. 1998. *Sound Level Data for Transportation, Construction, Manufacturing, and Power Plant Equipment*. Hoover & Keith Inc., 1988.

Moore, Chad. 2005. Personal communication with Mark Greenig, EDAW/CH2M HILL, January 26.

Mordy, Brooke D., and Donald L. McCaughey. 1968. *Nevada Historical Sites*. Desert Research Institute, Reno, Nevada.

Morgan, Dale L. 1943. *The Humboldt: Highroad of the West*. Farrar, Rinehart and Company, New York.

Mulligan, I. 2006. Nevada Department of Environmental Protection, E-mail and telephone conversation with Rich Dwerlkotte of EDAW on October 2.

Myrick, David F. 1992. *Railroads of Nevada and Eastern California* Volume I. University of Nevada Press, Reno, Nevada.

Nachlinger, J., K. Sochi, P. Comer, G. Kittel, and D. Dorfman. 2001. *Great Basin: An Ecoregion-Based Conservation Blueprint*. The Nature Conservancy, Reno, Nevada. 160 pp + appendixes.

National Park Service. 1992. *Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*.

National Park Service. 1999. "National Register Bulletin, Guidelines for Evaluating and Documenting Rural Historic Landscapes."

National Park Service. 2000. *Comprehensive Management and Use Plan and Final Environmental Impact Statement for the California National Historic Trail and the Pony Express National Historic Trail*. U.S. Department of the Interior. Long Distance Trails Office. Salt Lake City, Utah.

National Park Service. 2004. *Lincoln Highway, Special Resource Study Environmental Assessment*. National Park Service, U.S. Department of the Interior.

National Park Service. 2005. National Park Service Pony Express National Historic Trail website. http://www.nps.gov/poex/. May 12.

National Park Service. 2006. National Park Service Nature and Science Web Site. http://www2.nature.nps.gov/air/lightscapes/didUNo/index.cfm

Natural Resource Conservation Service. 1987. "Major Land Resource Area 28B." *Central Nevada Basin and Range Ecological Site Descriptions*.

Natural Resource Conservation Service. 1998. *Soil Survey of Western White Pine County Area, Nevada, Parts of White Pine and Eureka Counties*.

NatureServe Explorer. 2006. Sensitive Species Fact Sheers. http://www.natureserve.org/explorer/servlet/NatureServe

NDOA. See Nevada Department of Agriculture.

NDOT. See Nevada Department of Transportation.

NDOW. See Nevada Department of Wildlife.

Neel, L.A. (editor) 1999. *Nevada Partners in Flight Bird Conservation Plan.* 260 pp.

Nevada Bureau of Mines and Geology. 1998. Report 47, Second Edition, Mining Districts of Nevada. 3.3

Nevada Commission on Tourism. 2005. http://www.travelnevada.com. May 12.

Nevada Department of Agriculture. 2000. *Nevada's Coordinated Invasive Weed Strategy.* 43 pp.

Nevada Department of Conservation and Natural Resources, Division of Water Resources. 1971. *Nevada's Water Resources.* State of Nevada Planning Report.

Nevada Department of Conservation and Natural Resources. 1983. Reporter's transcript of proceedings before Peter G. Morros, State Engineer, Bristlecone Convention Center, Ely, Nevada, Wednesday, August 17.

Nevada Department of Employment, Training & Rehabilitation. 2006. Nevada Workforce Informer. Available at <http://www.nevadaworkforce.com>. Accessed on October 6.

Nevada Department of Taxation. 2005b. *Annual Report, Fiscal Year 2004-2005.*

Nevada Department of Transportation (NDOT). 2004. *Annual Traffic Report.*

Nevada Department of Transportation. 2005a. *2004 Annual Traffic Report.*

Nevada Department of Transportation. 2005b. Vehicle Classification & 18 Kip Equivalent Axle Load Templates. Accessed online at http://nevadadot.com/reports_pubs/traffic_report/2004/pdfs/Funcclass04.pdf on October 24, 2005.

Nevada Department of Transportation. 2005c. Annual Hourly Day of Week Summary for 2004 Reports for various highways in the project vicinity.

Nevada Department of Wildlife. 2004a. *Greater Sage-Grouse Conservation Plan for Nevada and Eastern California.* Prepared for: Nevada Governor Kenny C. Guinn. Sage-Grouse Conservation Team. First Edition. June 30.

Nevada Department of Wildlife. 2004b. http://www.ndow.org/about/facts/. Accessed December 3.

Nevada Department of Wildlife. 2005a. "Pygmy Rabbit Fact Sheet." http://www.ndow.org/wild/animals/facts/rabbit_pygmy.shtm. Accessed May 10.

Nevada Department of Wildlife. 2005b. State of Nevada Comprehensive Wildlife Conservation Strategy September 12, 2005. Reno, Nevada. http://www.ndow.org/wild/conservation/cwcs/#plan.

Nevada Department of Wildlife. 2005c. Wildlife and Habitat Website. Coyote. http://www.ndow.org/wild/animals/facts/coyote.shtml. Accessed on August 2, 2005.

Nevada Department of Wildlife. 2005d. Wildlife and Habitat Website. Mountain Lions. http://www.ndow.org/wild/animals/facts/mountain_lion.shtm. Accessed on August 2, 2005.

Nevada Department of Wildlife. 2006. Nevada Department of Wildlife website. http://www.ndow.org. Accessed June 1.

Nevada Division of State Parks. 1992. *Recreation in Nevada. Statewide Comprehensive Outdoor Recreation Plan (SCORP).* Revised 2003. Carson City, Nevada.

Nevada Division of State Parks. 2005. Nevada Division of State Parks website. http://www.parks.nv.gov/. May 12.

Nevada Division of Water Resources. 2006. http://water.nv.gov/

Nevada Natural Heritage Program. 2005a. National Vegetation Classification for Nevada. http://www.heritage.nv.gov/ecology/nv_nvc.htm. November 11.

Nevada Natural Heritage Program. 2005b. White Pine County Rare Species List, dated March 18, 2004 online. http://heritage.nv.gov/lists/cowhitep.htm. Accessed March 3.

Nevada Power Company. 2006. Integrated Resource Plan Filing of Nevada Power Company before the Public Utilities Commission of Nevada. June 30.

Nevada State Demographer's Office. 2004a. *Nevada County Population Estimates July 1, 1986 to July 1, 2004 – Includes Cities and Towns.* (Certified Estimates for 2001 to 2003 and DRAFT Certified 2004 Estimates with 2000 and Prior Estimates Based on Census 2000 for 1986 to 2000.)

Nevada State Demographer's Office. 2004b. *Nevada County Population Projections 2004 to 2024.*

Nevada State Demographer's Office. 2005. *Nevada County Population Estimates July 1, 1990 to July 1, 2005.* Includes Cities and Towns. (Certified Estimates for 2001 to 2005 and estimates prior to 2001 reflect information from the 1990 and 2000 Censuses.)

Nevada State Demographer's Office. 2006. Certified 2001 to 2005 Draft 2006 Estimated Population of Nevada's Counties, Cities and Towns with 2000 Estimate Based on Census 2000.

Nevada Steering Committee Intermountain Joint Venture. 2005. Coordinated Implementation Plan for Bird Conservation in Nevada. http://www.iwjv.org/Images/NVPlan.pdf. Accessed August 8, 2005.

Nevada Wilderness. 2005. Friends of Nevada Wilderness website http://www.nevadawilderness.org/. May 17.

Nichols, W.D., 2000. *Regional Ground-Water Evapotranspiration and Ground-Water Budgets, Great Basin, Nevada.* U.S. Geological Survey Professional Paper 1628.

NNHP. See Nevada Natural Heritage Program.

NPS. See National Park Service.

NRCS. See National Resource Conservation Service.

Oakleaf, R.J. 1974. (as cited in FWS 1986) Species Distribution and Key Habitats of Selected Non-Game Species. Admin, Rept. Nevada Dept. of Fish and Game, Reno, NV.

Paige, Christine and Sharon A. Ritter. 1999. *Birds in a Sagebrush Sea: Managing Sagebrush for Bird Communities*. Partners in Flight, Western Working Group. Boise, Idaho.

Patterson, Edna, Louise A Ulph, and Victor Goodwin. 1969. *Nevada's Northeast Frontier*. Western Printing and Publishing Company, Sparks, Nevada.

Perkins, Michaeal W. and William J. Lindsey. 1983. "Nesting Studies of Ferruginous Hawks in the Ely BLM District Nevada." North American Bird Bander.

Piaggio, A. J., E. W. Valdez, M. A. Bogan, and G. S. Spicer. 2002. "Systematics of Myotis Occultus (Chiroptera: Vespertilionidae) Inferred from Sequences of Two Mitochondrial Genes." *Journal of Mammalogy*. 83:386-395.

Pupacko A., D.B. Wood, and R.P. Williams. 1989. *Geohydrologic Data for Selected Springs in Eastern Nevada through 1982, with Emphasis on White Pine County*. U.S. Geological Survey Open-File Report 88-712.

Quadra Mining Ltd. 2005b. Robinson Mine. Available at <http://www.quadramining.com/s/RobinsonMine.asp>.

Quadra Mining Ltd. 2005a. Quadra Mining Ltd. Annual Report-2005. http://www.quadramining.com.

R.L. Banks & Associates, Inc. 2002. *Northern Bevada Railroad Project Engineering Study and Cost Estimate*. Prepared for the City of Ely, Nevada. Washington, D.C. and Tiburon, California.

Rajala, Karen. 2005. Personal communications between Karen Rajala of WPCEDC and Steve Pavich (ENTRIX) regarding miscellaneous data and other information provided by Ms. Rajala.

Rajala, Karen. 2006. White Pine County Economic Diversification Council. Miscellaneous personal communications between Karen Rajala of WPCEDC during September and October of 2006 and Mark Farman (EDAW) and Steve Pavich (ENTRIX) regarding public services data and other information supplied by Ms. Rajala or data that was provided to Ms. Rajala from other White Pine County staff (local staff that provided input includes, Bernie Romero, Sheriff's Department, Dean Day, City of Ely's Chief Engineer, Bunnie Hill, Social Services Department Director, Caroline McIntosh, Assistant Superintendent of the County's School District, and the staff of the local fire departments).

Rajala, Karen. 2007. White Pine County Economic Diversification Council. Miscellaneous personal communications between Karen Rajala of WPCEDC during January 2007 and Mark Farman (EDAW) and Steve Pavich (ENTRIX) regarding potential cumulative effects and various types of socioeconomic data obtained from state and local entities including: Nevada State Employment Security Division, the Nevada Department of Taxation, White Pine County School District, City of Ely Landfill, and City of Elko Landfill.

Recreation 2005. Recreation.gov website http://www.recreation.gov. Accessed May 17.

Reserve. 2005. Reserve America website. http://www. reserveamerica.com. May 14.

Robison, Kevin. 2007. Personal communications with Kevin Robison, Public Services Director of Mt, Wheeler Power, and Karen Rajala of WPCEDC.

Romero, Bernie. 2005. Personal communications with Bernie Romero of the White Pine County Sheriff Department and Karen Rajala of WPCEDC.

Root, T. 1988. Atlas of wintering North American birds: An analysis of Christmas Bird Count data. University of Chicago Press. 336 pp.

Sada, D. 2005. *Discussion on Springsnails of Concern within Steptoe Valley*. Desert Research Institute. June 7.

Sada, D. 2006. *Northern Steptoe Valley Springsnail Surveys, White Pine County, Nevada*. Report prepared for EDAW, Inc. by Division of Hydrologic Sciences, Desert Research Institute, Reno, Nevada.

Saunders, D.A. and R.J. Hobbs (eds.). 1991. *Nature Conservation: The Role of Corridors*. Surrey, Beatty and Sons, Chipping Norton, Australia.

Saur, J. R., B.G. Peterjohn, S, Schwartz, and J.E. Hines. 1996. The North American Breeding Bird Survey home page. Version 95.1 Patuxent Wildlife Research Center, Laurel, Maryland.

Savard, C.S. and E.J. Crompton. 1993. *Hydrologic Data for East-Central Nevada, Water Years 1982-88*. U.S. Geological Survey Open-File Report 90-153.

Sawyer, Fritz. 2007. Personal communications with Fritz Sawyer, City of Elko, and Karen Rajala of WPCEDC.

Schaafsman, Polly. 1986. "Rock Art." In: Great Basin. Warren L. d'Azevedo (ed.), pp 215-226. *Handbook of North American Indians*, Volume 11. William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Schmidly, D. J. 1991. The bats of Texas. Texas A & M Univ. Press, College Station. 188 pp.

Schrader, F. C. 1931. Spence Mountain District, Elko County, and Cherry Creek (Egan Canyon) District, White Pine County. University of Nevada Bulletin 25:1-39.

Sheley, R. and J. Stivers. 1999. "Whitetop." Pp. 401-407 In: R.L. Sheley and J.K. Petroff, eds., *Biology and Management of Noxious Rangeland Weeds*. Oregon State University Press, Corvallis. 438 pp.

Sheley, Roger L., Bret E. Olson, Carla Hoopes. 2001. Impacts of Noxious Weeds. Montana State University Extension Service online: www.weedsawareness.org/Impacts.html

Shevenell, L., and L.J. Garside. 2004. *Nevada Geothermal Resources.* Nevada Bureau of Mines and Geology, Map 141, 2nd Edition.

Shimkin, Demitri B. 1953. "The Wind River Shoshone Sun Dance." Anthropological Papers 41, *Bureau of American Ethnology Bulletin* 151:397-484. Washington.

Sierra Pacific Power Company. 2006. Thirteenth Amendment of the 2004 Intregrated Resource Plan filing of Sierra Pacific Power Company before the Public Utilities Commission of Nevada.

Smith, Anne M. Cooke. 1993. *Shoshone Tales.* University of Utah Press, Salt Lake City.

Smith, Roscoe M. 1976. "Mineral Resources." In Geology and Mineral Resources of White Pine County, Nevada. *Nevada Bureau of Mines and Geology, Bulletin 85.*

Southern Pacific. Undated. *The New nevada: The Era of Irrigation, and the Opportunity of the Farmer, the Dairyman, and Stockman.* Published by the passenger Department. San Francisco, California.

Southwell, Roland. 2006. Personal communication with Richard Deis (EDAW), July, Member of the Eastern Nevada Lincoln Highway Association, Ely, Nevada.

SRK Consulting. 2006a. *Evaporation Pond Design, Operation and Maintenance Manual, White Pine Energy Station White Pine County, Nevada.*

SRK Consulting. 2006b. *Permit Application White Pine Energy Station Class III Solid Waste Disposal Facility*, White Pine County.

Stalmaster, M.V. 1986. *The Bald Eagle.* Universe Books. New York. 227 pp.

Stein, J.R. and J. Salisbury. 1994. *Status and Distribution of Relict Dace (Relictus solitarius).* Nevada Department of Conservation and Natural Resources, Division of Wildlife (now Department of Wildlife). Elko. 36 pp.

Steward, Julian H. 1937. "Ethnological Reconnaissance among the Desert Shoshoni. Pp 87-92 in *Exploration and Field Work of the Smithsonian Institution in 1936.* Washington.

Steward, Julian H. 1938. "Basin-Plateau Aboriginal Sociopolitical Groups." *Smithsonian Institution Bureau of American Ethnology* Bulletin 120. Washington.

Steward, Julian H. 1941. "Culture Element Distributions: XIII. Nevada Shoshoni." *University of California Anthropological Records* 4(2):209-359.

Stoner, Edward J., Mary K. Rusco, and Richard Deis. 2000a. *Toolstone Quarriers and Stone Tool Carriers: The Archaeology of Nine Sites in the Egan Range, White Pine County, Nevada.* Cultural resources report prepared by Western Culture Resource Management, Inc., Sparks, Nevada, for BHP Copper and the Bureau of Land Management, Ely District, Ely, Nevada.

Stoner, Edward J., Mary K. Rusco, C.W. Wheeler, and F. Nials. 2000b. *The Archaeology of Two Upland Paleoarchaic Sites in Giroux Wash, White Pine County, Nevada.* Prepared for BHP Copper and the Bureau of Land Management, Ely district by Western Cultural Resource Management, Inc., Reno.

Sveum, C.M., J.A. Crawford, and W.D. Edge. 1998. "Use and Selection of Brood-Rearing Habitat by Sage Grouse in South Central Washington." *Great Basin Naturalist.* 58(4):344-351.

Texas State Parks. Pallid Bat Fact Sheet. 2006. http://www.tpwd.state.tx.us/huntwild/wild/species/pallid/ Accessed June 28, 2006

Thomas, David H. 1983. "The Archaeology of Monitor Valley 1." Epistemology. *Museum of Natural History Anthropological Papers* 58(1) New York.

Thomas, David H., Lorann S.A. Pedleton, and Stephen C. Cappannari. 1986. "Western Shoshone." In Great Basin, edited by Warren L. d'Azevedo, pp. 161-283. *Handbook of North American Indians. Vol. 11,* W.C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Townley, John M. 1986. *The Pony Express Guidebook.* Great Basin Studies Center, Reno.

Tribble. 2005. BLM Ely District Office Recreation and Wilderness Team Lead. Personal communication with Chad Schneckenburger, EDAW, Inc., May 24, 2005.

Trigger, Bruce G. 1967. "Settlement Archaeology – Its Goals and Promise." *American Antiquity* 32:149-160.

Trimble, S. 1989. *The Sagebrush Ocean.* University of Nevada Press, Reno.

True, Gordon. 1913. Agriculture. In *History of Nevada.* Elms Publishing Company. Reno, Nevada.

Tumbusch, M. L., and D.H. Schaefer, 1996. *Selected Hydrologic Data for and Location of MX Wells in East-Central and Southern Nevada, January 1980 through May 1996.* U.S. Geological Survey Open-File Report 96-469.

U.S. Army Corps of Engineers. 1987. *Wetland Delineation Manual, Wetland Delineation Methods.* Wetlands Research Program Technical Report Y-87-1. 92 p. plus appendices.

U.S. Bureau of Land Management 2000. *Management Guidelines for Sage Grouse and Sagebrush Ecosystems in Nevada.* October 2000.

U.S. Bureau of Land Management and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. U.S. Department of the Interior, Bureau of Land Management Office of Public Affairs, Washington, D.C. 69 pp.

U.S. Bureau of Land Management. 1984a. Final Environmental Impact Statement, White Pine Power Project: 1500 Megawatt Coal-Fueled Generating Facility, White Pine County, Nevada.

U.S. Bureau of Land Management. 1984b. Proposed Egan Resource Management Plan and Final Environmental Impact Statement. Prepared by the Ely District Office. Ely, Nevada. check cite.

U.S. Bureau of Land Management. 1986a. *Visual Resource Inventory.* BLM Manual Handbook 8410-1.

U.S. Bureau of Land Management. 1986b, *Visual Resource Contrast Rating.* BLM Manual Handbook 8431-1.

U.S. Bureau of Land Management. 1993. Southwest Intertie Project Final Environmental Impact Statement and Proposed Plan Amendment. Prepared in cooperation with the U.S. Forest Service, National Park Service, Bureau of Indian Affairs, and Bureau of Reclamation. Technical reports prepared by Dames and Moore.

U.S. Bureau of Land Management. 1994. Southwest Intertie Project Record of Decision and Approved Land Use Plan Amendment. Prepared by the Burley, Shoshone, and Boise District Offices, Idaho; the Elko, Ely, and Las Vegas District Offices, Nevada; and the Richfield District Office, Utah.

U.S. Bureau of Land Management. 1998. *BLM Manual 8720, General Procedural Guidance for Paleontological Resource. Management.*

U.S. Bureau of Land Management. 1999. *State Protocol Agreement Between the Bureau of Land Management, Nevada and the Nevada State Historic Preservation Office.* On file at Bureau of Land Management, Nevada State Office, Reno.

U.S. Bureau of Land Management. 2001. *Interim Management Policy for Lands Under Wilderness Review.*

U.S. Bureau of Land Management. 2001a. *Falcon to Gonder 345kV Transmission Project, Final Environmental Impact Statement and Proposed Resource Management Plan Amendments.* NV 063-EIS00-27 1790/1600, N-63162 2800. U.S. Department of the Interior, Bureau of Land Management, Battle Mountain, Elko, and Ely Field Offices, Nevada. December.

U.S. Bureau of Land Management. 2003. *Proposed Toquop Land Disposal Amendment to the Caliente Management Framework Plan and Final Environmental Impact Statement for the Toquop Energy Project.* March.

U.S. Bureau of Land Management. 2004. National Sage-Grouse Habitat Conservation Strategy.

U.S. Bureau of Land Management. 2005a. *Draft –Resource Management Plan/Environmental Impact Statement for the Ely District. Ely Field Office, Ely Nevada.*

U.S. Bureau of Land Management. 2005b. *Land Records 2000 Database. Case Recordation of Land Use Authorizations.* Run Date May 17, 2005. BLM State Office. Reno, Nevada.

U.S. Bureau of Land Management. 20 06. Payments in lieu of Taxes. http://www.nbc.gov/pilt/. Accessed October 6.

U.S. Census Bureau. 2005. Population Division, Interim State Population Projections.

U.S. Census Bureau. 1990a. 1990 Census, Summary Tape File 1, Table DP-1. Available <http://factfinder.census.gov>. December 22, 2004.

U.S. Census Bureau. 1990b. 1990 Census, Summary Tape File 1, Table DP-4. Available <http://factfinder.census.gov>. December 22, 2004.

U.S. Census Bureau. 2000a. 2000 Census, Summary File 1, Table DP-1. Available <http://factfinder.census.gov>. December 22, 2004.

U.S. Census Bureau. 2000b. 2000 Census, Summary File 1, Table DP-4. Available <http://factfinder.census.gov>. December 22, 2004.

U.S. Census Bureau. 2000c. 2000 Census, Summary File 3, Table DP-3. Available <http://factfinder.census.gov>. December 22, 2004.

U.S. Census Bureau. 2004. http://www.census.gov/hhes/poverty/threshld/thresh04.html. Access Date.

U.S. Department of Commerce, Bureau of Economic Analysis,. 2004a. "Total Full-Time and Part-Time Employment by Industry (CA25N), Regional Economic Accounts." Available at <http://www.bea.doc.gov/regional/reis/>. Accessed on September 26, 2006.

U.S. Department of Commerce, Bureau of Economic Analysis. 2004b. "Personal Income by Major Source and Earnings by Industry (CA05N), Regional Economic Accounts." Available at <http://www.bea.doc.gov/regional/reis/>. Accessed on September 26, 2006.

U.S. Department of Energy. 2007. "Energy Efficiency and Renewable Energy. EERE State Energy Alternatives." Accessed March 14.

U.S. Department of Transportation, Bureau of Transportation Statistics. 2001. AADT for I-15 in Clark County. Accessed online at http://www.transtats.bts.gov/DL_SelectFields.asp?Table_ID=1102&DB_Short_Name=HPMS. Accessed October 25.

U.S. Department of Transportation. 2000. *Proposed Construction or Alternative of Objects that May Affect the Navigable Airspace.* Federal Aviation Administration. Advisory Circular AC 70/7460-2K.

U.S. Environmental Protection Agency. 1995. *Volume II, Emission Factors for Mobile Sources*. Document AP-42. 5th edition and updates.

U.S. Environmental Protection Agency. 2005a. Office of Air Quality Planning and Standards (OAQPS) Tabulated Dose-Response Assessments, http://www.epa.gov/ttn/atw/toxsource/summary.html, "Table 1. Prioritized Chronic Dose-Response Values. Accessed February 28, 2005.

U.S. Environmental Protection Agency. 2005b. Office of Air Quality Planning and Standards (OAQPS) Tabulated Dose-Response Assessments, http://www.epa.gov/ttn/atw/toxsource/summary.html, "Table 2. Acute Dose-Response Values for Screening Risk Assessments. Accessed June 2, 2005.

U.S. Fish and Wildlife Service. 1986. *Recovery Plan for the Pacific Bald Eagle.* U.S. Fish and Wildlife Service, Portland, Oregon. 160 pp.

U.S. Fish and Wildlife Service. 2003. *Status Assessment and Conservation Plan for the Western Burrowing Owl in the United States.* Biological Technical Publication BTP-R6001-2003. Sheperdstown, West Virginia. 108 pp.

U.S. Fish and Wildlife Service. 2004. Sage grouse fact sheet online. Mountain Prairie Region, Endangered Species Program. http://mountainprairie.fws.gov/species/birds/sagegrouse/sagegrousefactsheet.pdf. Accessed August 6.

U.S. Fish and Wildlife Service. 2005. Columbia Spotted Frog, Great Basin Population, Fact Sheet online. http://www.fws.gov/idahoes/Fact/SpotFrog.html. Accessed August 15.

U.S. Fish and Wildlife Service. 2006. *Draft National Bald Eagle Management Guidelines.* Public Review Draft.

U.S. Forest Service. 2005. USDA Forest Service Humboldt-Toiyabe National Forest, Ely Ranger District website. http://www.fs.fed.us/r4/htnf/districts/ely.shtml. May 12.

U.S. Forest Service. 2005. USDA Forest Service website. http://www.fs.fed.us/. May 31.

U.S. Geological Survey. 2004. GAP Analysis Program, Southwest Regional GAP Landcover, September 15, 2004.

Ulmschneider, H. 2004. Surveying for Pygmy Rabbits (*Brachylagus idahoensis*). Fourth Draft 25 pp.

United States Department of Agriculture. 1998. *Soil Survey of Western White Pine County Area, Nevada, Parts of White Pine and Eureka Counties*. Prepared by Natural Resources Conservation Service.

University of Nevada Cooperative Extension. 2005. Cooperative Extension Fact Sheet FS-03-04. http://www.unce.unr.edu/publications/FS03/FS0304.pdf.

University of Nevada, Reno. 2004. *Analysis of Socio-Economic Data and Trends for White Pine County: Part 1.* Technical Report UCED 2003/04-21. Published by the University Center for Economic Development in the Department of Resource Economics.

USACE. See U.S. Army Corps of Engineers.

USDA. See U.S. Department of Agriculture.

USFS. See U.S. Forest Service.

U.S. Forest Service. 2006. USFS web site. http://www.fs.fed.gov. May 31.

USGS. See U.S. Geological Survey.

Vigg, S. 1982. Ecology of the Nevadan relict dace, *Relictus solitarius* (Hubbs and Miller) with a selected bibliography on Great Basin desert fishes. Bioresources Center, Desert Research Institute, Reno, Nevada. Public. No. 50019.

Vlasich, James A. 1981. "History. In Prehistory, Ethnohistory, and History of Eastern Nevada: A Cultural Resources Summary of the Elko and Ely Districts." Edited by Steven R. James. *Bureau of Land Management, Nevada, Cultural Resources Series No. 3.*

Walker, Terry. 2007. Transportation Supervisor. White Pine County School District. 2007. Personal communication with Wendy Haydon/CH2M HILL on January 25.

Walton, W.C. 1962. *Selected Analytical Methods for Well and Aquifer Evaluation*. Illinois State Water Survey, Bulletin 49.

Welch, Patrick H. 1979. *Historic Overview of the Shoshone-Eureka Resource Area*. Bureau of Land Management, Battle Mountain District.

Western Electricity Coordinating Council. 2005. *10-Year Coordinated Plan Summary*. June. Chapter 1

White Pine County 1998a. *White Pine County Land Use Plan*. Prepared by the White Pine County Commissioners, the Ely City Council, and the White Pine County Regional Planning Commission. Ely, Nevada. Provided by the White Pine County Economic Diversification Council, May 2005.

White Pine County 1998b. *Appendix 1 White Pine County Public Land Use Plan.* Included as Appendix 1 to the White Pine County Land Use Plan. Prepared by the White Pine County Commissioners, the Ely City Council, and the White Pine County Regional Planning Commission. Ely, Nevada. Provided by the White Pine County Economic Diversification Council, May 2005.

White Pine County Chamber of Commerce. 2006. White Pine County Chamber of Commerce website.

White Pine County Economic Diversification Council. 2006. "White Pine County, Nevada 2006 Comprehensive Economic Development Strategy, White Pine County, Nevada."

White Pine County School District. 2007. School Bus Schedules. Accessed online at http://www.whitepine.k12.nv.us. January 16.

White Pine County. 2005b. White Pine County website. May. http://www.whitepinecounty.com/.

White Pine Energy Associates. 2006. Miscellaneous information provided by WPEA staff regarding project construction costs, operations spending, employment, construction waste densities and volumes, SOPs and other socioeconomics-related project commitments. Various phone and e-mail communications between August and October 2006.

White Pine Energy Associates. 2005. *Siting Study for the Proposed White Pine Energy Station*. St. Louis, Missouri.

White Pine Energy Associates. 2004. *Justification of Direct Sale of BLM Land to WPEA*. December 14, 2004.

White Pine Historical and Archaeological Society. 2005. Accessed online at: http://www.webpanda.com/white_pine_county/historical_society/attractions/climate.htm.

White Pine Tourism 2006. White Pine County Tourism and Recreation Board website. Accessed June 1, 2006. http://www.elynevada.net/

White, A.F. 1871. *Third Biennial Report of the State Mineralogist of Nevada for the Years 1869 and 1870: Carson City, Nevada.*

Wilde, James D., and Reed A. Soper. 1999. Baker Village: Draft Report of Excavations, 1990-1994, *Brigham Young University Museum of Peoples and Cultures, Technical Series No. 99-12.* Office of Public Archaeology, Brigham Young University, Provo.

Williams, Jason. 2005. Nevada Department of Wildlife. Conference call with the Biological Core Team (EDAW). Potential need for surveys regarding raptors and other migratory species. February 23.

Williams, Jason. 2006. Nongame Biologists, Nevada Department of Wildlife. E-mail and telephone conversation with R. Tressler, EDAW. June 29.

Wilson, D. E., and D. M. Reeder (editors). 1993. *Mammal Species of the World: a Taxonomic and Geographic Reference.* Second Edition. Smithsonian Institution Press, Washington, DC. xviii + 1206 pp. Available online at: http://www.nmnh.si.edu/msw/.

Woffinden, N. D. 1975. "Ecology of the Ferruginous Hawk (*Buteo regalis*) in Central Utah: Population Dynamics and Nest Site Selection." M.S. thesis. Brigham Young University, Provo, Utah. 102 pages.

Woods, C. 2003. Ely RMP/EIS *Ethnographic Studies Technical Report.* Bureau of Land Management. Ely Field Office. Nevada.

WPCEDC. See White Pine County Economic Diversification Council.

WPHAS. See White Pine Historical and Archaeological Society.

Yeates, R.S., K. Sieh, and C.R. Allen. 1997. *The Geology of Earthquakes*. Oxford University Press Inc.

Yoakum, J.D., B.W. O'Gara, and V.W. Howard. 1996. "Pronghorn on Western Rangelands." Pages 211-226 in P.R. Krausman. Editor. *Rangeland Wildlife*. Society Range Management, Denver, Colorado.

Glossary

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100-year flood	A flood with a magnitude that may occur once every 100 years on average. An area has a 1-in-100 chance of being inundated during any single year.
Access (road)	Road used for passage to project sites and along utility corridors for purposes of construction, operation, and maintenance.
Acre-foot	Volume of water (43,560 cubic feet) that would cover 1 acre, 1 foot deep. Equivalent to 325,851.3 gallons.
Aesthetic quality	A perception of the beauty of a natural or cultural landscape.
Affected environment	Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action.
Air quality	Measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.
Air quality classes	Classifications established under the Prevention of Significant Deterioration (PSD) portion of the Clean Air Act that limit the amount of air pollution considered significant within an area. Class I applies to areas where almost any change in air quality would be significant; Class II applies to areas where the deterioration normally accompanying moderate well-controlled growth would be permitted; and Class III applies to areas where industrial deterioration would generally be allowed.
Alluvial fan	Cone-shaped deposits of alluvium made by a stream. Fans generally form where streams emerge from mountains onto the lowland.
Alluvial, alluvium	Relating to material deposited by running water, such as clay, silt, sand, and gravel. Sedimentary material transported and deposited by the action of flowing water.
Alternative (action)	An option for meeting the stated purpose and need.
Alternative (route)	An optional path or direction for a road, pipeline, or transmission line.
Ambient	The surrounding natural conditions (or environment) in a given place and time.

Animal Unit Month (AUM)	The amount of forage necessary for the sustenance of one cow or its equivalent (one cow, bull, steer, heifer, horse, burro, mule, five sheep, or five goats over the age of 6 months at the time of entering the public lands or other lands administered by BLM) for a period of 1 month.
Aquatic	Growing or living in or near the water.
Aquifer	A stratum or body of permeable rock, sand, etc. that contains water. Water source for a well.
Archaeology	The scientific study of the life and culture of ancient peoples, as by excavation of ancient cities, relics, or artifacts.
Area of Critical Environmental Concern	A BLM designation for an area within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources, or other natural systems or processes; or to protect life from natural hazards.
Artifact	Any object showing human workmanship or modification, especially from a prehistoric or historic culture.
Assessment (environment)	An evaluation of existing resources and potential impacts on them from a proposed act or change to the environment.
Avifauna	Birds of a specified region or time.
Ballast	Gravel or broken stone laid in a railroad bed.
Cambrian	The earliest geologic period in the Paleozoic Era, spanning the time of 570 to 500 million years ago, and marked by a profusion of marine animals.
Candidate species	A plant or animal species not yet officially listed as threatened or endangered, but which is undergoing status review by the USFWS.
Capability	The ability to generate or transmit power.
Capacity	The maximum load that can be generated or transmitted by generating or transmission facilities for a given period of time without exceeding approved limits of temperature or stress.
Clean Water Act	Provides for pollution control activities and funding at the federal level including grant programs, research and related programs, as well as provisions for setting standards and enforcement actions.
Connected action	A project that is closely related to but not a part of the proposed project.

corvid	A family of birds that contains crows, ravens, rooks, jackdaws, jays, magpies, treepies, and nutcrackers.
Council on Environmental Quality	An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effort on the environment studies, and advises the President on environmental matters.
Cubic feet per second	Unit of discharge, or volume rate of flow, equal to 0.0283 cubic meters per second. As a rate of streamflow, a cubic foot of water passing a referenced section in 1 second. A measure of a moving volume of water (1 cfs = 0.0283 m^3/s).
Cultural resources	A broad, general term meaning any cultural property reflecting past human activity or use that has a definite location, and any traditional lifeway value important to a contemporary social and/or cultural group's traditional systems of religious belief, cultural practices, or social interaction.
Cumulative impact	The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions—regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7).
Demand	The energy requirement (load) placed upon a utility's generation at any specific point in time. A utility's demand (energy needed) increases and decreases instantaneously as consumers turn their electrical appliances on or off. Demand is increased or decreased in such terms as watts, kilowatts, and megawatts.
Direct effect	Caused by the action and occurs at the same time and place (40 CFR 1508.8(a)).
Draft Environmental Impact Statement	A detailed written statement as required by Section 102(2)(c) of NEPA.
Effect (also see Impact)	
Emergent (vegetation)	Vegetation with all or part of their vegetative and reproductive parts above the water.
Endangered species	Any species in danger of extinction throughout all or a significant portion of its range.
Endemic	Plants or animals that are native to a particular region or country.

Environment	The surrounding conditions, influences or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.
Environmental Impact Statement	A formal public document prepared to analyze the impacts on the environment of the proposed project or action and released for comment and review. An EIS must meet the requirements of NEPA, CEQ guidelines, and directives of the agency responsible for the proposed project or action.
Environmental Impact Statement, Final	The final version of the public document required by NEPA.
Ephemeral	Present only during a portion of the year. Generally refers to water courses.
Evapotranspiration	The combined loss of water from a given area and during a specific period of time by evaporation from the soil surface and by transpiration from plants.
Fault	A fracture or fracture zone in the earth's surface along which there has been displacement of the sides relative to one another.
Fauna	The wildlife or animals of a specified region or time.
Federal Energy Regulatory Commission	Agency primarily responsible for ensuring adequate energy supplies at just and reasonable rates and providing regulatory incentives for increased productivity, efficiency, and competition.
Federal Land Policy and Management Act of 1976	Public Law 94-579 signed by the President on October 21, 1976. Established public land policy for management lands administered by the Bureau of Land Management (BLM). FLPMA specifies several key directions for the BLM, notably: 1) management on the basis of multiple use and sustained yield; 2) land use plans prepared to guide management actions; 3) public lands for the protection, development, and enhancement of resources; 4) public lands retained in federal ownership; and 5) public participation used in reaching management decisions.
Floodplain	That flat portion of a river or stream valley adjacent to the river channel that is built of sediments and is inundated with water when the stream overflows its banks.
Fossil	The remains or traces of an organism or assemblage of organisms that have been preserved by natural processes in the earth's crust.

Generation	Process of producing electrical energy by transforming other forms of energy; also, amount of electric energy produced, expressed in kilowatt hours.
Geologic formation	A rock unit distinguished from adjacent deposits by some common physical characteristic, such as its composition, origin, color, or age.
Geology	The science that studies the earth. The materials, processes, environments, and history of the planet, especially the lithosphere, including the rocks and their formation and structure.
Habitat	The region where a plant or animal naturally grows or lives. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and home range.
Hydrology	The science that studies the properties, distribution, and circulation of natural surface water and ground water.
Impact	A modification in the status of the environment brought about by a proposed action.
Indirect effect	Caused by the action later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include: growth inducing effect and other effects related to induced changes in the pattern of land use; population density or growth rate; and related effects on air and water and other natural systems, including ecosystems.
Infrastructure	The basic installations and facilities on which the continuance and growth of a community depend (for example, roads, schools, sewers, power plants, transportation, and communication systems).
Isolate/Isolated Artifact	A single artifact, feature, or object not associated with other cultural resources. An isolate is not normally considered a property.
Isopleth	A line on a map connecting points at which a given variable has a specified constant value.
Kilovolt	1,000 volts (a volt is a measure of electrical potential difference that would cause a current of 1 ampere to flow through a conductor whose resistance is 1 ohm).
Kilowatt	A unit of power equivalent to 1,000 watts.

Landform	A term used to describe the many types of land surfaces that exist as a result of geologic activity and weathering (for example, plateaus, mountains, plains, and valleys).
Lithic	Pertaining to stone or a stone tool (for example, lithic artifact).
Lithology	The appearance, structure, and composition of rocks as determined by study with the unaided eye or with little magnification.
Megawatt	1,000 kilowatts or 1 million watts (a watt is a unit of electrical power equal to 1/756th horsepower).
Migratory	Birds, animals, or people that migrate or move from one region or country to another.
Mineral resource	Any inorganic or organic substance occurring naturally in the earth that has a consistent and distinctive set of physical properties. Examples of mineral resources include coal, nickel, gold, silver, and copper.
Mississippian	A period of the Paleozoic Era, spanning in time from about 345 to 320 million years ago.
Mitigate	To alleviate, reduce, or render less intense or severe.
Mitigation	Action taken to avoid, reduce the severity of, or eliminate an adverse impact.
National Ambient Air Quality Standards	Air quality standards established by the Clean Air Act. The primary NAAQS are intended to protect the public health with an adequate margin of safety; the secondary NAAQS are intended to protect the public welfare from any known or anticipated adverse effects of a pollutant.
National Environmental Policy Act of 1969	Public Law 91-190. Establishes environmental policy for the nation. Among other items, NEPA requires federal agencies to consider environmental values in decision-making processes.
National Register of Historic Places	A listing of architectural, historical, archaeological, and cultural sites of local, state, or national significance, established by the Historic Preservation Act of 1966 and maintained by the National Park Service.
Native vegetation	Vegetation originating in a certain region or country.
Nonattainment area	An air quality control region (or portion thereof) in which the U.S. Environmental Protection Agency has determined that ambient air concentrations exceed national ambient air quality standards for one or more criteria pollutants.

Ozone	A form of oxygen, O_3, produced especially when an electric spark is passed through oxygen or air.
Paleontology	The science that deals with the life of past geological ages through the study of the fossil remains of organisms.
Paleozoic	The geologic era between the Precambrian and Mesozoic eras covering the time between 550 million and 225 million years ago. The era was characterized by the development of the first fishes, amphibians, reptiles, and land plants.
Particulates	Minute, separate particles, such as dust or other air pollutants.
Pennsylvanian	A period of the Paleozoic Era, spanning from about 320 million to 280 million years ago.
Perennial	Lasting, or active through the whole year. May refer to rivers, streams, or plants.
Permeability	The measure of the ease with which a fluid can diffuse through a particular porous materials.
Permian	The seventh and last period of the Paleozoic Era, spanning from about 280 to 225 million years ago, characterized by increased reptile life and major mountain building in North America.
Petroglyph	A symbolic design or drawing or an animal or human pecked or carved into a rock or cliff face—generally prehistoric.
Physiographic Province	A large area characterized by distinctive topography, geologic structure, and other features and phenomena of nature.
Plateau	An elevated tract of relatively level land, such as a tableland or large mesa.
Playa	The shallow central lake basin of a desert plain, in which water gathers after a rain and is evaporated.
Pleistocene	The first geologic epoch during the Quaternary period, spanning from 1.8 million years ago to approximately 10,000 years ago, characterized by extensive continental glaciation in the Northern Hemisphere.
Policy	A guiding principle upon which is based a specific decision or set of decisions.
Power	Measure of the amount of energy (work) being used at a specific point in time. Power is measured in such terms as watts, kilowatts, and megawatts. Power implies capacity in addition to energy.

Precambrian	The earliest geologic era covering all time from the formation of the earth and ending at the Paleozoic Era, which began about 520 million years ago.
Primitive	An area that is not developed, a pristine natural area.
Quaternary	The geologic period following the Tertiary in the Cenozoic Era, beginning about 1.8 million years ago, composed of the Pleistocene and Holocene epochs, characterized by the evolution of Hominids into modern humans.
Range	A large, open area of land over which livestock can wander and graze.
Raptor	A bird of prey.
Rare	A plant or animal restricted in distribution. May be locally abundant in a limited area or few in number over a wide area.
Reclamation	Returning disturbed lands to a form and productivity that will be ecologically balanced.
Region	A large trace of land generally recognized as having similar character types and physiographic types.
Revegetation	The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance such as reseeding.
Right-of-way	Strip of land acquired by legal means, over which the utility corridors and access roads would pass.
Sacred site	Any specific, discrete, narrowly delineated location on Federal land identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative has informed the agency of the existence of such a site.
Scenic quality class	The designation (A, B, or C) assigned a scenic quality rating unit to indicate the visual importance or quality of a unit relative to other units within the same physiographic province (BLM designation).
Scenic quality rating unit	A portion of the landscape that displays primarily homogeneous visual characteristics of the basic landscape features (landform, water, vegetation, and structures and modifications) that separate it from the surrounding landscape.

Sediment	Solid fragmental material, either mineral or organic, that is transported or deposited by air, water, gravity, or ice.
Seismicity	The relative frequency and distribution of earthquakes.
Semiarid	A climate or region characterized by little yearly rainfall and by the growth of a number of short grasses and shrubs.
Sensitive species	Species whose populations are small and widely dispersed or restricted to a few localities. Species that are listed or candidates for listing by the state or federal government.
Sensitivity	The state of being readily affected by the actions of external influence.
Site	In archaeology, any locale showing evidence of human activity.
Socioeconomic	Of or involving both social and economic factors.
Species	A group of individuals of common ancestry that closely resemble each other structurally and physiologically, and in nature interbreed to produce fertile offspring.
Spring	A place where ground water flows naturally onto the land surface; often the source of a stream.
Strata	Plural of stratum, which is a layer of sedimentary rock that was originally deposited horizontally.
Study area	A given geographical area delineated for specific research.
Subspecies	Any natural subdivision of a species that exhibits small, but persistent morphological variations from other subdivisions of the same species living in different geographical regions or times.
Substrate	Sediment that lies beneath the surface of the earth.
Take	A prohibited action under federal law, except where authorized. To harass, harm, pursue, hunt, wound, kill, trap, capture, or collect a federally listed threatened or endangered species, or to attempt to do so. Take may include disturbance of the listed species, nest, or habitat, when disturbance is extensive enough to disrupt normal behavioral patterns for the species, although the affected individuals may not actually die.
Talus	A pile of rock debris at the foot of a cliff or steep slope.
Tertiary	The first period in the Cenozoic Era, spanning from 65 to 1.8 million years ago characterized by the development of mammals.

Threatened species	Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Topography	The relative positions and elevations of surface features of an area.
Traditional cultural property	A term referring to a tangible site, district, structure, building, or object with defensible boundaries that is important to a contemporary human community and has been for 50 years or more, that has significance under one or more criteria of the National Register of Historic Places, and with integrity of location, design, setting, materials, workmanship, feeling, and association in the perspective of those who value the place.
Triassic	The first period in the Mesozoic Era, spanning from 225 to 190 million years ago and following the Permian Period of the Paleozoic Era; characterized by the first appearance of many reptiles, including the dinosaurs.
Tributary	A stream or river that flows into a larger stream or river.
Utility corridor	A route used by a utility for pipelines and transmission lines.
Vegetation community	Species of plants that commonly live together in the same region or ecotone.
View shed	Visible portion of the specific landscape seen from a specific viewpoint, normally limited by landform, vegetation, distance, and existing cultural modifications.
Visual resource management class	Classification of landscapes according to the kinds of structures and changes that are acceptable to meet established visual goals (BLM).
Waters of the United States	All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce including adjacent wetlands and tributaries to waters of the United States; and all waters by which the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.
Wetlands	Lands or areas exhibiting hydric soils, saturated or inundated soil during some portion of the plant growing season, and plant species tolerant of such conditions (includes swamps, marshes, bogs).
Wind rose	A diagram which depicts the frequency and intensity of winds from various directions for a particular location.

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