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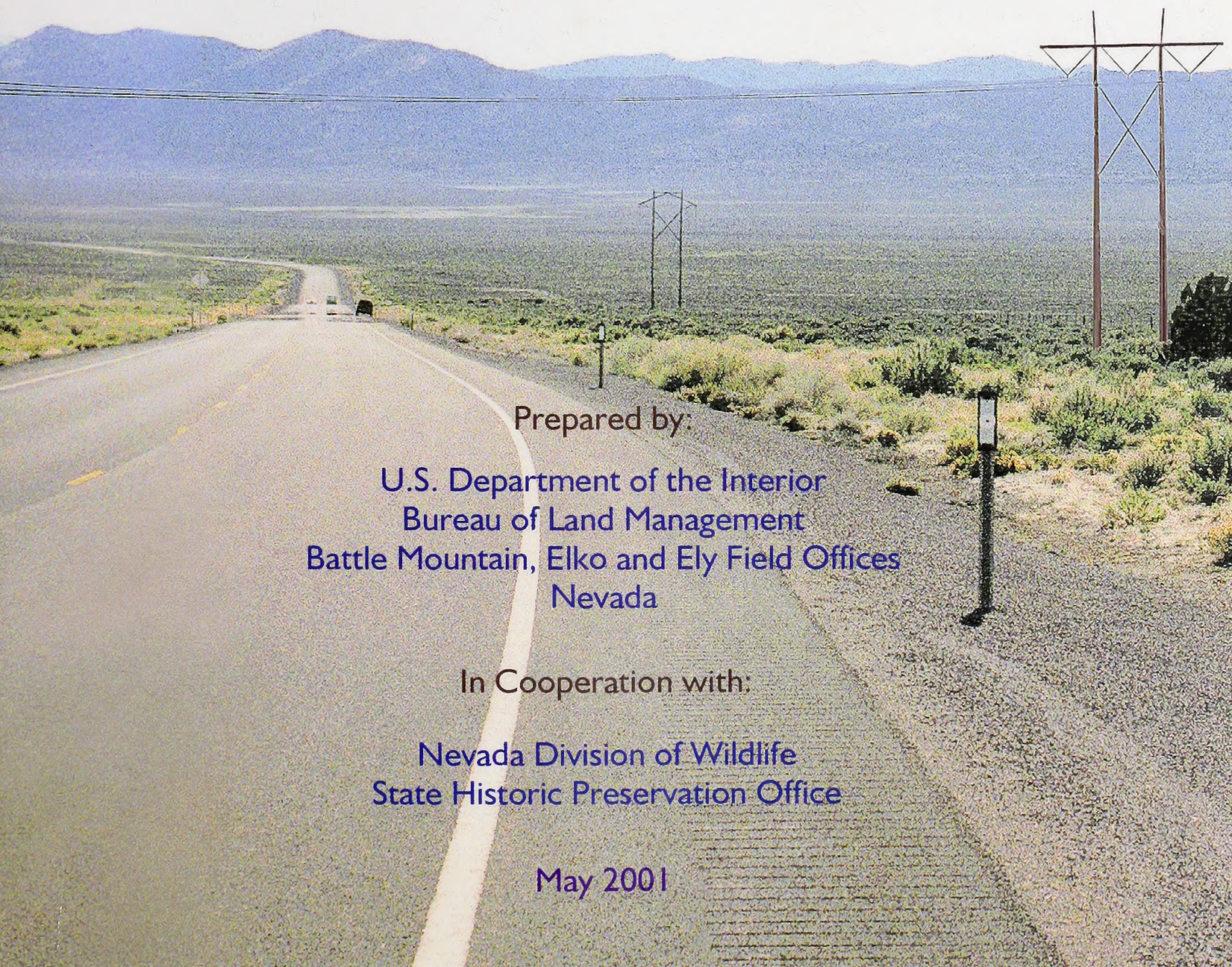

Prepared by:

U.S. Department of the Interior
Bureau of Land Management
Battle Mountain, Elko and Ely Field Offices
Nevada

In Cooperation with:

Nevada Division of Wildlife
State Historic Preservation Office

May 2001

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In Reply, Refer to:
NV 063-EIS00-27
1790/1600
N-63162
2800

Dear Reader:

Enclosed for your review and information is the Draft Environmental Impact Statement (EIS) prepared by the Bureau of Land Management (BLM) for the proposed Falcon to Gonder 345 kV transmission project and related Resource Management Plan amendments.

The Draft EIS analyzes the direct, indirect, and cumulative impacts associated with the construction, operation, and maintenance of a 345 kV transmission line that would cross both public and private lands in north central Nevada. The project applicant, Sierra Pacific Power Company, has applied to the BLM for a right-of-way grant for the portion of the transmission line that would traverse federal public lands. This Draft EIS also analyzes related amendments to BLM's Shoshone-Eureka, Elko, and Egan Resource Management Plans.

Written comments on the Draft EIS are encouraged and must be postmarked by August 22, 2001. Please send written comments to: Mary Craggett, Bureau of Land Management, Battle Mountain Field Office, 50 Bastian Road, Battle Mountain, NV 89820.

A Final EIS will be issued upon the completion of the 90-day review period for this Draft EIS. If you have any questions, or would like any additional information, please contact Mary Craggett, BLM Team Leader, at (775) 635-4060, or Kenneth Bailey, Project Coordinator, at (775) 635-4092.

Sincerely,

M. Lee Smith

for Gerald M. Smith
Field Manager
Battle Mountain Field Office

Enclosure:
Falcon-Gonder DEIS

DRAFT FALCON TO GONDER 345 kV TRANSMISSION PROJECT ENVIRONMENTAL IMPACT STATEMENT AND RESOURCE MANAGEMENT PLAN AMENDMENTS

Lead Agency:	U.S. Department of the Interior Bureau of Land Management (BLM) Battle Mountain, Elko and Ely Field Offices
Cooperating Agencies	Nevada Division of Wildlife State Historic Preservation Office
Project Location:	Eureka, Elko, Lander, and White Pine Counties, in the State of Nevada. The project would be constructed on both public and private lands.
EIS Number: Case File Number	NV 063-EIS00-27 N-63162
Correspondence on this EIS Should be Directed to:	Mary Craggett, Team Leader Bureau of Land Management, Battle Mountain Field Office 50 Bastian Road Battle Mountain, NV 89820-1420 (775) 635-4060
Questions Related to this EIS Should be Directed to:	Mary Craggett, Team Leader Bureau of Land Management, Battle Mountain Field Office 50 Bastian Road Battle Mountain, NV 89820-1420 (775) 635-4060
Website:	This document is also available on our website at http://www.nv.blm.gov/falcongonder

ABSTRACT

Sierra Pacific Power Company (SPPC) is proposing to construct a new 345 kV electric transmission line in north central Nevada that would extend approximately 165-185 miles between the Falcon substation west of Dunphy to the Gonder substation north of Ely. The transmission line would be supported by approximately 725 to 820 tubular steel H-frame structures and angle towers that would vary in height from 75 to 130 feet above ground level, depending on the terrain. The project also includes the expansion and installation of additional facilities at the existing Falcon and Gonder substations. SPPC has applied for a right-of-way grant from the BLM to construct, operate and maintain the project on federal public land. This Draft Environmental Impact Statement (EIS) analyzes the environmental effects of five potential transmission line route alternatives for the project, as well as the No Action Alternative. The Draft EIS also analyzes the environmental effects of amendments to BLM Resource Management Plans (RMPs) that may be required as part of the proposed action (i.e., amendments to the Shoshone-Eureka, Elko, and Egan RMPs). Written comments on the Draft EIS must be postmarked by August 22, 2001, and sent to the address above.

Responsible Official for the EIS: Robert V. Abbey
Nevada State Director
Bureau of Land Management

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This Environmental Impact Statement (EIS) has been prepared by the U.S. Bureau of Land Management (BLM) pursuant to the requirements of the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 et seq. and its implementing regulations issued by the Council on Environmental Quality (40 CFR 1500-1508). The BLM is the lead agency for this EIS, with the Battle Mountain Field Office serving as the lead office. This document was prepared with the cooperation of the BLM's Elko and Ely Field Offices, as well as the Nevada Division of Wildlife and State Historic Preservation Office.

The purpose of this document is to analyze the environmental effects of a new power transmission line being proposed by Sierra Pacific Power Company in north central Nevada, and to evaluate related amendments to BLM Resource Management Plans.

PROPOSED ACTION

This EIS is intended to inform the public, agencies and decision-makers about potentially significant environmental effects of the "Proposed Action" and measures that can be taken to mitigate environmental effects. The Proposed Action would involve the BLM's approval of:

- Sierra Pacific Power Company's application to secure a right-of-way grant to construct, operate, maintain and terminate a 345 kV transmission line on federal public lands. The transmission line would connect two existing substations (the Falcon to the Gonder substations) and the project would also involve expansion and upgrades of the two substations. Sierra Pacific Power Company (SPPC) refers to this proposal as their "Falcon to Gonder project."
- BLM Resource Management Plan amendments would be required to designate a new utility corridor along the preferred route alternative, as portions of the transmission line would be outside of currently designated corridors. The amendments also would modify a previous decision in order to allow the transmission line to cross a low-visibility corridor along the Interstate 80 (I-80), and would delete an existing planning corridor along Nevada Highway 305. These amendments are summarized below and discussed in detail in Chapter 5.

PROJECT DESCRIPTION

SPPC is proposing to construct a new 345 kV electric transmission line to provide a new connection between its Falcon and Gonder substations. Depending on the route selected, the transmission line would be approximately 165 to 185 miles long and supported by approximately 725 to 820 tower structures, varying in height between 75 to 130 feet above ground depending on the terrain. Expansion and installation of additional facilities at the existing Falcon and Gonder substations would also be needed to upgrade the stations' capacity.

The project would require acquisition of a right-of-way grant from the BLM for the portion of the transmission line that would cross public lands. SPPC would pay rental fees for use of the right-of-way on public land. Right-of-way easements would also be acquired on some privately owned lands. The properties would remain under ownership of the title holder, and private property owners would be compensated for the use of the easement. SPCC would own, operate and maintain the transmission line and pay property taxes based on the value of the line improvements.

Project construction is scheduled to begin in May 2002 with completion by June 2003. The project includes a Reclamation Plan (see Appendix E) to revegetate and reclaim areas disturbed by construction activities.

PROJECT NEED

SPPC serves over 250,000 retail customers in northern Nevada and northeastern California with a service territory covering over 50,000 square miles. SPPC also provides transmission services to the Bonneville Power Administration (which delivers power to the Wells Rural Electric Company and Harney Electric Cooperative), Mt. Wheeler Power (delivering power to Ely and Eureka, Nevada), and the Truckee Donner Public Utility District. Energy load demand forecasts contained in SPPC's 1998-2017 Electric Resource Plan show that the utility's current infrastructure system will not be able to reliably meet future peak period demands as early as the year 2003.

On April 8, 1999, the State of Nevada Public Utilities Commission (PUC) selected the Falcon to Gonder project as the best option to address the projected system capacity limitations and enable SPPC to continue serving northern Nevada's energy needs. The Falcon to Gonder project would improve SPPC's electric import capability by 260 megawatts and enable Sierra to provide electric transmission service between Nevada, Idaho, Utah and the Northwest. If the Falcon to Gonder project is not approved, SPPC would need to immediately notify the PUC and begin emergency planning to address the projected year 2003 capacity shortfall.

PROJECT ALTERNATIVES

Five route alternatives are being considered in this EIS as possible ways to route the transmission line between the Falcon and Gonder substations. As shown in Figure ES-1, these include:

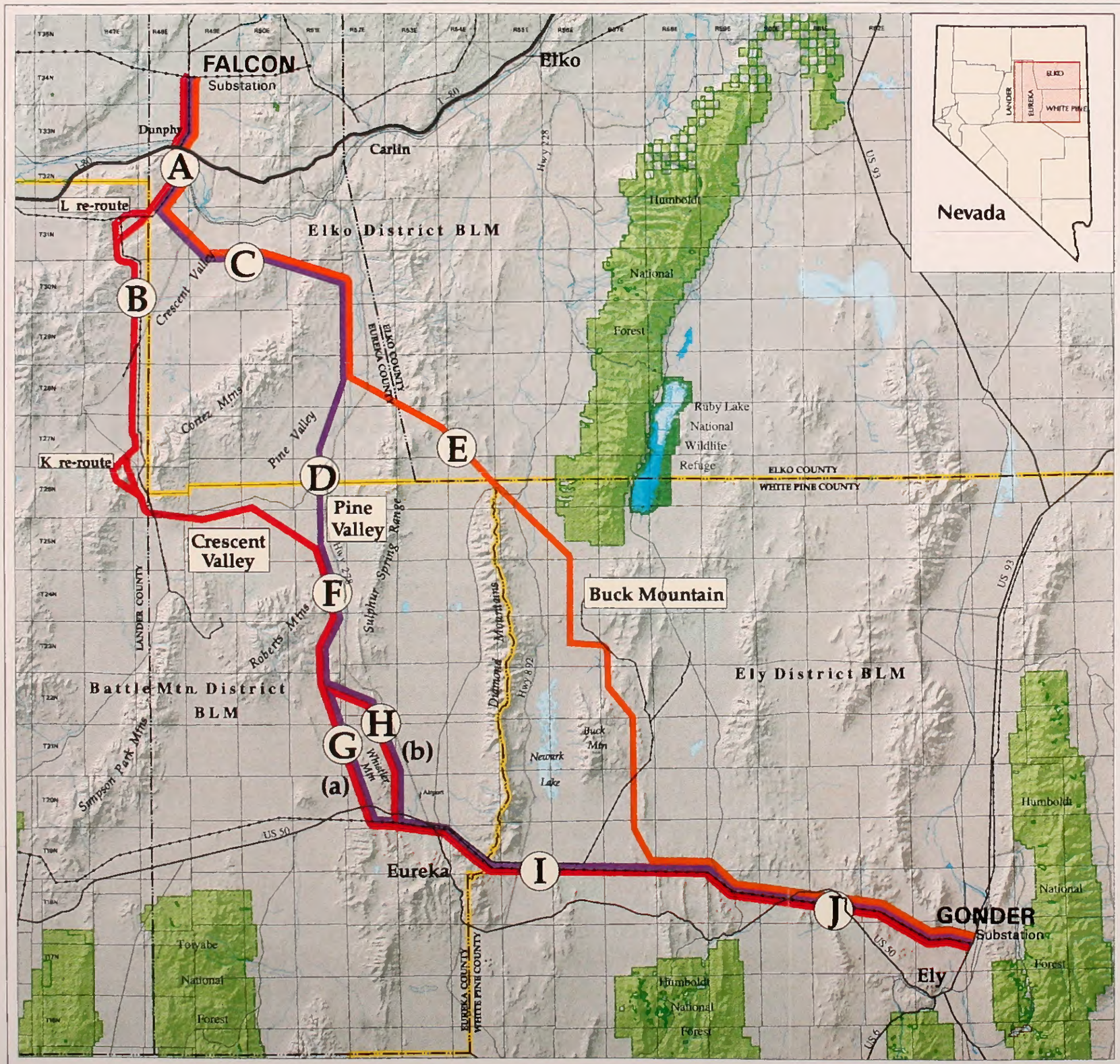
- Crescent Valley (a) route alternative
- Crescent Valley (b) route alternative
- Pine Valley (a) route alternative
- Pine Valley (b) route alternative
- Buck Mountain route alternative

The BLM has selected the Pine Valley (a) route as the preferred alternative, based on the analysis contained in this document.

This EIS also considers the No Action Alternative, which would mean that the transmission line would not be constructed between the Falcon and Gonder substations, nor would the substation upgrades be made. Under the No Action Alternative, SPPC would immediately begin emergency planning measures with the PUC to compensate for the anticipated shortfall in its system capacity.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

A number of other project alternatives were considered and eliminated from further analysis in the EIS by the BLM during meetings with resource specialists held early on to discuss the project and potential alternatives to meet its objectives while minimizing environmental impacts. These alternatives and the reasons for their elimination from further analysis are summarized in Chapter 2.



Sierra Pacific Power Co.

FALCON to GONDER Project

Route Alternatives

Route	Segmentation
Crescent Valley	
(a)	A–B–F–G–I–J
(b)	A–B–F–H–I–J
Pine Valley	
(a)	A–C–D–F–G–I–J
(b)	A–C–D–F–H–I–J
Buck Mountain	A–C–E–J

BLM District Boundary

Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco

11/07/00

SOURCES: EDAW, Inc. 1999 / Stantec Consulting, Inc. 1998 / Nevada —Bureau of Mines & Geology GIS / USGS —DEM

Figure ES - 1

ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

Chapters 3 and 4 examine potential environmental impacts associated with the five route alternatives, as well as the No Action Alternative. The BLM selected the following resource topics as being specifically relevant for this EIS, based on their knowledge of the area and comments received during the public scoping process:

1. Geology and Minerals
2. Soils
3. Water Resources
4. Vegetation (including Wetlands)
5. Invasive, Nonnative Species
6. Wildlife and Wildlife Habitat
7. Special-Status Species – Animals and Plants
8. Range Resources (Livestock Grazing and Wild Horses)
9. Visual Resources
10. Public Health and Safety
    (Fire Management, Hazardous Materials and Electric and Magnetic Fields)
11. Noise
12. Air Quality
13. Land Use and Access
14. Recreation and Wilderness
15. Social and Economic Values
16. Cultural Resources
17. Paleontology
18. Environmental Justice
19. Native American Concerns

BLM CRITICAL ELEMENTS

This EIS also discusses the following "Critical Elements," which are mandated for consideration by BLM policy and various government regulations:

• Air Quality	*(see Section 3.12)*
• Areas of Critical Environmental Concern	*(There are no designated Areas of Critical Environmental Concern in the project area)*
• Cultural Resources	*(see Section 3.16)*
• Environmental Justice	*(see Section 3.18)*
• Farmlands, prime or unique	*(There are no prime or unique farmlands in the project area)*
• Floodplains	*(see Section 3.3)*
• Invasive, nonnative species	*(see Section 3.5)*
• Migratory Birds	*(see Section 3.6)*
• Native American Religious Concerns	*(see Sections 3.16, 3.19)*
• Special-Status Species	*(see Section 3.7)*
• Wastes, Hazardous/Solid	*(see Section 3.10)*
• Water Quality (Surface and Ground)	*(see Sections 3.2, 3.3)*
• Wetlands / Riparian Zones	*(see Sections 3.3, 3.4)*

- Wild and Scenic Rivers — *(There are no designated Wild and Scenic Rivers in the project area)*
- Wilderness — *(see Section 3.14)*

IMPACTS COMMON TO ALL ROUTE ALTERNATIVES

The following environmental impacts would occur no matter which route alternative is used to build the project.

Geology and Minerals

Portions of the transmission line would traverse areas with steep terrain, seismic hazards, landslide potential and soft, expansive and corrosive soils, which could damage the tower footings. Engineering techniques that can be used to address these constraints include: soil testing, site investigations to avoid tower placement in active fault zones, selective use of helicopters in steep terrain, and reinforcing tower foundations.

Soils

Portions of the transmission line would traverse areas with highly erodible soils and steep slopes that could cause significant erosion impacts and special challenges related to reclamation success. These impacts and obstacles can be mitigated to less-than-significant by minimizing grading and vegetation removal in problem areas, using erosion control best management practices, and using weight-dispersing construction equipment and techniques in wet areas or in highly erodible soils when feasible.

Water Resources

The project has the potential to cause construction-related discharges of sediment and contaminants into water and alter water flows in channels, shallow springs, and wells. Similarly, all five alternatives would cross blue line streams (as shown on U.S.G.S. topographical quadrangle maps), flood plains, and flash flood hazard areas. However, impacts to water resources can be mitigated by preparation and compliance with appropriate prevention plans, strategic tower placement, use of Best Management Practices, and other measures.

Vegetation

Losses of upland and disturbed plant communities would be adverse but not significant for any of the five route alternatives. Similarly, temporary disturbance to wetlands, other waters of the U.S. (e.g., Humboldt River) and riparian communities would be adverse but not significant. Mitigation measures that would minimize impacts include: restricting construction vehicles and equipment to designated areas, using best management practices, installing fencing around wetland and riparian areas to create a buffer zone, and restoring wetlands and riparian areas to ensure no net loss.

Invasive, Nonnative Species

Portions of the transmission line would traverse areas containing noxious weed infestations (primarily hoary cress). The introduction or spread of noxious weeds and cheatgrass by project activities would be a potentially significant impact. This impact can be mitigated to less-than-significant by restricting construction vehicles and equipment to designated areas, using best management practices, educating construction, operations and maintenance personnel, creating fenced buffer zones around infestations, treating infestations, cleaning equipment, using certified weed-free materials, and restoring plant communities.

Wildlife

The main impacts to wildlife would result from habitat disturbance and loss, habitat fragmentation and increased human access. The regional context is such that the habitat loss would be adverse but not significant. Some individual wildlife may be impacted due to the construction of the project but these impacts would not affect populations as a whole. Certain precautions (such as pre-construction surveys) would diminish direct impacts to some species. Timing of project construction would also mitigate potential impacts to species such as mule deer. The physical presence of the transmission line could cause some avian species to collide with the lines; thus mitigation measures such as flight diverters would be required in critical areas.

Special-Status Species

Impacts to special-status species from project construction and operation would be similar to those for wildlife; mitigation measures would also be similar. The most significant impacts on a special-status species would be those related to sage grouse. These could include habitat disturbance, habitat fragmentation, and increased predation from birds of prey perching on transmission line towers. Mitigation measures, such as widespread use of perch deterrents and off site mitigation is recommended for sage grouse. These measures would help with the understanding of the birds' biology and interrelationship of habitat.

Other sensitive species, such as the rock-dwelling plant Pennell draba, occur within the project area. Potential impacts to this and other special-status species such as burrowing owl, and pygmy rabbit would be mitigated by pre-construction surveys and sensitive habitat exclusion zones, thereby negating any direct impacts. Potential impacts to nesting ferruginous hawks could occur from implementation of the project. This significant impact could be mitigated by avoiding construction activities during nesting periods. Other direct impacts could be mitigated through construction design and reclamation.

Range Resources

No significant impacts to livestock grazing or wild horses would occur. SPPC would coordinate with BLM and grazing permittees to avoid or minimize disruptions to grazing activities during construction and to ensure that water sources remain accessible.

Visual Resources

All of the route alternatives would cross a designated "low visibility" corridor along Interstate 80 and would be visible to eastbound and westbound traffic. Portions of the alternatives would cross over the Pony Express and Eureka-Palisade Railroad grade and potentially impact the visual setting of these sites. Vegetation removal and grading impacts associated with construction activity is common to all route alternatives. Minimizing grading, vegetation removal and revegetatating the disturbed area after construction should reduce this impact. Potential visual impacts may occur to occupied residences near the transmission line. Mitigation measures to help reduce visual impacts will be used.

Public Health and Safety (Fire Management, Hazardous Materials and EMF)

The potential of fire from transmission line construction and operation would be minimized through tree clearing in the right-of-way, engineering design, constructing the line based on minimum ground clearance and other standards set by the National Electrical Safety Code, and implementing a Fire Prevention and Suppression Plan (all of which are part of the proposed project). SPPC would also implement a Hazardous Materials Management Plan, including spill prevention and control measures and blasting safety measures, to minimize hazards. Research into studies of electric and magnetic fields (EMF) found a general consensus among medical and scientific communities that there is insufficient evidence to conclude that EMF cause adverse health effects.

Noise

Short-term construction noise would be significant for residents and facilities within 500 feet of construction activities. However, this impact could be mitigated by requiring mufflers on vehicles and limiting noisy construction activities (such as blasting) near residences and other buildings between Monday through Saturday, 7 a.m. to 7 p.m. During project operation, people living or working near the right-of-way edge could experience noise from the transmission lines (i.e., humming or crackling noises during wet or humid conditions).

Transmission line noise could significantly impact approximately 10 existing residential units along Segment B near Crescent Valley (if one of those routes is used) and/or approximately 11 residential units in a subdivision along Segment J (which is common to all five route alternatives). However, these impacts could be mitigated to less-than-significant levels.

In wet weather it is possible that AM radio reception for weak signals could be adversely affected by corona-induced noise on the right-of-way. Segment B has one existing residential unit (a trailer) within the right-of-way, and Segment J has 3 residences close to the right-of-way edge that could be affected. Although this is not a significant impact, mitigation measures are proposed.

Air Quality

No significant impacts to air quality were identified.

Land Use and Access

The existence of the transmission line would restrict land uses in, and potentially along, the right-of-way. Mitigation measures are identified that can reduce this impact. No significant impacts related to roads or access were identified.

Recreation / Wilderness

No significant impacts to recreation or wilderness resources were identified.

Social and Economic Values

No significant adverse impacts to social or economic values were identified. On the contrary, the project would generate between $35,200,000 and $37,680,000 in state property tax revenues for government agencies in the first 40 years of the project. Project-related spending would also increase sales tax revenue for local governmental agencies. In addition, SPPC would pay right-of-way rental fees to the BLM for use of public lands. Private property owners would receive compensation for right-of-way easements on their lands.

Cultural Resources

Numerous prehistoric and historic sites recommended eligible for the National Register of Historic Places (NRHP) exist throughout the project area. Direct impacts to prehistoric and historic sites, including surface or subsurface disturbance incurred during project construction, operation, or maintenance, could occur anywhere along the proposed route alternatives. Measures to mitigate these impacts could include: 1) avoidance 2) monitoring, and 3) data recovery. A detailed mitigation program would be provided in an Historic Property Treatment Plan.

The potential to discover unanticipated cultural sites, including human remains, during construction activities occurs everywhere along the proposed route alternatives. Construction activities could damage or destroy these previously unknown sites. To mitigate these potential effects, SPPC would immediately halt all ground-disturbing activities within 50 meters of the discovery and secure the area to prevent vandalism or other damage. The BLM authorized officer would be notified immediately of the discovery.

Authorization to proceed would be issued in writing by the BLM only after the discovery had been evaluated and any necessary mitigative measures completed.

The proposed project could also increase traffic and accessibility in areas that were previously inaccessible or more remote, which could potentially increase unauthorized collection and vandalism of significant archaeological sites. Worker training and education, restriction of access to sensitive sites, and exclusionary flagging or fencing would be implemented to mitigate these potential impacts.

A number of unevaluated cultural resource sites exist both within, and outside of, the selected route alignment. These unevaluated sites may be eligible for the NRHP. Sites left unevaluated after selection of the preferred route and agency review of site significance recommendations may be further examined by the BLM, by way of field visits and/or archaeological testing. The project would also have visual impacts to some cultural sites. Various mitigation measures for potential impacts to cultural resources are proposed and would be detailed in the Historic Property Treatment Plan.

Paleontological Resources

All project route alternatives (portions of Segments B, C, D, and E, specifically) would cross the Hay Ranch Formation, which has a high potential for the existence of significant paleontological resources such as fossil mammals, plants, and invertebrates. To mitigate these potential impacts, a paleontologist meeting BLM qualifications would monitor construction activities in the Hay Ranch Formation and document significant findings. Similar measures as those stated above would be used for unplanned discoveries of paleontological resources encountered during project construction.

Environmental Justice

No environmental justice impacts (i.e., no disproportionate impacts to low-income or minority communities) were identified.

Native American Concerns

Medicinal plants are important in maintaining the Western Shoshone cultural traditions, and may occur anywhere in the project area. The plant locations are confidential to Native Americans, and have not been mapped. Project construction, operation, and maintenance may disturb or destroy these plants. Western Shoshone traditionalists knowledgeable about the location of traditional medicinal plants in the project area would be interviewed after selection of the preferred alternative. Information obtained from these interviews would be used to avoid areas that may contain medicinal plants. Medicinal plant areas that may be located within or near project components shall be field-checked by a botanist qualified to recognize such plants, and such information shall remain confidential.

COMPARISON OF ALTERNATIVES

The following summarizes the distinguishing characteristics and impacts associated with the five route alternatives.

Crescent Valley (a) and (b) Route Alternatives

The Crescent Valley (a) and (b) route alternatives have the potential to conflict with the Cortez mine expansion. The Crescent Valley (a) and (b) alternatives contain the most existing developments within 1,000 feet of the proposed project (i.e., 30 and 34 buildings respectively), when compared to the other routes. With both Crescent Valley route alternatives, transmission line noise could significantly impact approximately 10 existing residential units along Segment B near Crescent Valley (if one of those routes was used) and/or approximately 11 residential units in a subdivision along Segment J (which is common to all five route alternatives). However, these impacts could be mitigated to less-than-significant levels.

The Crescent Valley alternatives would have the greatest overall impacts to sensitive wildlife species. In addition to crossing 10 to 12 miles of mule deer winter range, respectively, the Crescent Valley routes cross the most miles of ferruginous hawk territory and near several sensitive sage grouse leks that could not be fully mitigated. The Crescent Valley alternatives would have the fewest impacts related to noxious weeds and cheatgrass, largely because of the existence of parallel transmission lines and previous disturbance. However, invasive weed impacts could be mitigated to a less-than-significant level.

The Crescent Valley (a) and (b) route alternatives could affect the highest number of significant cultural sites. These routes would come within two miles of several areas of concern to Western Shoshone tribes, as well as within two miles of six historic ranches. They also could impact the Shoshone Wells Historic Townsite, a significant ethnohistoric property, and would be within the viewshed of three significant Traditional Cultural Properties (TCPs) and ethnohistoric sites. These route alternatives contain large numbers of significant or unevaluated historic and prehistoric sites within the 500-foot wide study corridor, indicating the potential for disturbance during construction of the transmission line. Both Crescent Valley alternatives would cross the historic Pony Express Trail, which would be a significant impact and mitigation measures are recommended that would reduce it to a less-than-significant impact. Both Crescent Valley alternatives would be constructed near properties that could contribute to the proposed Roberts Mountain ethnohistoric district.

The Crescent Valley (a) and (b) alternatives have the highest number of significant visual impacts to key observation points (KOPs) by comparison with the Pine Valley and Buck Mountain alternatives. Both Crescent Valley routes would transect a significant cultural site. Due to the importance of the surrounding landscape to the site, these routes would have a high impact on the visual setting and result in a significant impact to this site.

Crescent Valley (b) would create a significant impact at the Pony Express Trail crossing. Both Crescent Valley alternatives would have a significant visual impact on the Eureka-Palisade Railroad grade (KOP 24). Crescent Valley (a) and (b) alternatives have the most miles of existing transmission lines (i.e., parallel alignment opportunities) – a positive element for minimizing visual impacts.

Pine Valley (a) and (b) Route Alternatives

The Pine Valley (a) route alternative would traverse the fewest number of privately owned parcels (Stantec 2000). The Pine Valley (a) route has approximately 18 existing buildings within 1,000 feet of the proposed centerline and 213 buildings within 1.5 miles, while the Pine Valley (b) route has about 22 buildings within 1,000 feet and 288 buildings within 1.5 miles. As with all of the route alternatives, transmission line noise could significantly impact approximately 10 existing residential units in a subdivision along Segment J. However, these impacts could be mitigated to less-than-significant levels.

The Pine Valley (a) alternative would cause the fewest impacts to sensitive wildlife species overall. The Pine Valley (a) and (b) route alternatives contain the fewest numbers of significant or unevaluated prehistoric sites. Both route alternatives would cross the historic Pony Express Trail, creating a significant visual impact; mitigation is recommended. Both route alternatives would be constructed near properties that could contribute to the proposed Roberts Mountain ethnohistoric district. The Pine Valley alternatives would also have a visual impact on the historic Eureka-Palisade Railroad grade, as the impact would affect the landscape context and visual setting of this historic site. Both of these routes would also be visible from the Colonel Conner Massacre Site, a potential ethnohistoric property. Both route alternatives would avoid any TCPs that are recommended as eligible for the NRHP, but could impact two currently unevaluated TCPs. Overall, the Pine Valley (a) route alternative would have the fewest impacts to cultural resources.

Overall, the Pine Valley (a) and (b) alternatives have the least amount of significant visual impacts.

Buck Mountain Route Alternative

The Buck Mountain route is the shortest of all the alternatives but crosses the greatest number of privately held parcels (i.e., 73). The Buck Mountain route has approximately 13 existing buildings within 1,000 feet of the proposed centerline and 173 buildings within 1.5 miles. As with all of the route alternatives, transmission line noise could significantly impact approximately 10 existing residential units in a subdivision along Segment J. However, these impacts could be mitigated to less-than-significant levels.

Although Buck Mountain is the shortest route, it would be extremely close to several sensitive sage grouse leks and impact the greatest number of ferruginous hawk nests. The Buck Mountain route also contains the most undisturbed and unfragmented habitat of all the alternatives.

The Buck Mountain route contains numerous significant or unevaluated prehistoric and historic sites within the 500-foot wide study corridor. Many of these sites also retain a high amount of integrity given their relatively remote location. Like the Pine Valley routes, the Buck Mountain alternative would involve impacts to the historic Eureka-Palisade Railroad grade and the Colonel Conner Massacre Site, a potential ethnohistoric property. This route also would transect the portion of the Beowawe-McGill aboriginal trail identified in Railroad Pass and may affect 12 recorded cultural properties that may contribute to the proposed Railroad Pass ethnohistoric district. It would also transect cultural properties that could contribute to an ethnohistoric district associated with antelope hunting, would cross the Pony Express Trail and would be within the viewshed of the Emigrant Trail.

The Buck Mountain alternative ranks in the middle between the Crescent Valley and Pine Valley routes in terms of significant visual impacts. Significant impacts could occur at three locations along the Buck Mountain route alternative. The Visual Resource Management analysis (VRM) resulted in strong structural contrast ratings for all KOPs along Segment E of the Buck Mountain route and moderate visual impacts for four KOPs and significant impacts for two KOPs. The Buck Mountain alternative has the fewest miles of existing transmission lines (i.e., parallel alignment opportunities).

TABLE ES-1: SUMMARY OF RANKINGS — ROUTE ALTERNATIVES COMPARISON

	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Wildlife	4	5	1	3	2
Invasive Weeds	1	2	3	4	5
Cultural Resources	4	5	1	2	3
Visual Resouces	2	4	1	2	3
			Preferred Alternative		

No Action Alternative

The National Environmental Policy Act (NEPA) requires that an EIS include analysis of the "No Action Alternative," against which the effects of the "action" alternatives can be evaluated and compared. The no action alternative in this EIS would mean that no new transmission facilities would be constructed between the Falcon and Gonder substations. Under the No Action Alternative, SPPC would attempt to meet its rapidly growing customer needs with existing facilities, along with other measures to compensate for the anticipated shortfall in the supply of electrical power in the region. The No Action Alternative

also would mean that the associated BLM Resource Management Plan amendments would not be required.

Under the No Action Alternative, the projected shortage of electric power in SPPC's control area will continue to grow as customers demand greater amounts of electricity. This shortage is forecast to occur during peak load conditions in the summer of 2003, and may result in the curtailment of some customers. Under this alternative, there will also be a continued shortage of recommended energy reserves during peak load conditions. This existing shortage could result in SPPC's inability to provide service to some customers during unscheduled outages of major transmission or generation facilities. Under the No Action Alternative, adverse environmental, socioeconomic, and electric service impacts could result from compensating actions taken by SPPC to ensure an adequate, affordable, and reliable energy supply to northern Nevada.

If the No Action Alternative is selected following the EIS and right-of-way application review process, SPPC would immediately notify the State of Nevada Public Utilities Commission that it cannot comply with the commission's Electric Resource Planning Opinion and Order issued April 8, 1999. This order found that the Falcon to Gonder 345 kV transmission project is in the public interest. Following notification, SPPC and the commission would most likely initiate an emergency planning process to determine the best way to meet forecast customer energy requirements.

BLM PREFERRED ALTERNATIVE

As the lead agency, the BLM is responsible for selecting a preferred alternative. The BLM's *National Environmental Policy Act Handbook* directs that "the selection of the preferred alternative should be based on the environmental analysis as well as consideration of other factors which influence the decision or are required under another statutory authority" (BLM 1998:V-8). The BLM has selected the Pine Valley (a) transmission line route as the preferred alternative.

This selection is based on the analysis in this EIS, as well as other considerations related to the agency's mission and responsibilities to manage federal public lands for multiple beneficial uses while balancing that objective with the need to protect environmental and cultural resources. This alternative would achieve the project objective of upgrading SPPC's electric transmission system capacity to address projected shortfalls in the year 2003. It also would have the fewest impacts to sensitive wildlife, cultural and visual resources than any of the route alternatives considered.

In this instance, the BLM selected the "environmentally preferred" transmission line route alternative as the agency's preferred alternative. The methodology used to identify the environmentally preferred route is explained in Section 3.20 and Appendix C of the DEIS. While the No Action Alternative would avoid environmental impacts associated with the Pine Valley (a) transmission line route alternative, it would not achieve the project objectives. Furthermore, a full array of mitigation measures has been developed to reduce and/or avoid environmental impacts before, during and after construction of the project.

SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL IMPACTS

While the majority of environmental impacts would be fully mitigated by SPPC through avoidance of sensitive areas, reclamation, best management practices and other techniques, impacts to the following resources could remain significant and unavoidable with the Pine Valley (a) transmission line route (i.e., the preferred alternative):

- Visual impacts to the historic Eureka-Palisade Railroad grade along Segments C and D (as shown in Figure 3.9-11, KOP 10.

The transmission line would be visible from the historic Eureka-Palisade Railroad grade, either by paralleling it for a number of miles or by traversing it. Under either scenario, the transmission line would create an adverse visual impact to the historic setting of this NRHP-eligible resource. As mitigation, the 62-mile stretch of the Eureka-Palisade Railroad grade would be thoroughly recorded using complete photographic recordation in the location of Segments C and D. Interpretive signs at two locations would be placed where the grade is visible from State Highway 278. Archival research and preparation of a final report would also be completed for a thorough recordation of the railroad. These measures would help reduce but not entirely mitigate the impact. Thus, this impact would be considered significant and unavoidable.

EFFECTS ON PRIVATE PROPERTY OWNERS

While approximately 80 percent of the transmission line would cross public lands, right-of-way easements would be required on some private properties. One of the most frequent questions received at the scoping meetings (held at the beginning of the project to solicit input on community concerns and topics to be covered in the EIS) was *"How would this affect my property rights?"* SPPC would retain a qualified, independent real estate appraiser to estimate the market value of a permanent easement for the transmission line across private land.

The appraiser would also evaluate loss to personal property, if any, such as restrictions on growing crops or other uses, and potential loss in property value. After this analysis, a written offer would be presented to the property owner. SPPC would negotiate with the property owner to reach a mutually agreeable and fair settlement.

Upon completion of negotiations with the property owner, SPCC would record the easement document in the public records of the county in which the property is located. Being a public record, the permanent easement would be noted by title companies and would transfer with the property each time it is sold. Some owners believe that a transmission line may diminish the overall value of their property. That would depend on the location, size, current and potential uses of the property, and other factors. These factors would be evaluated in the independent real estate appraisal and would be included in the total compensation package, if applicable.

BLM RESOURCE MANAGEMENT PLAN AMENDMENTS

Approval of the Pine Valley (a) route alternative would also involve amendments to two BLM Resource Management Plans as part of the same federal action. As some portions of the route would be outside of BLM designated utility corridors (see Figure ES-2), the following amendments to the Shosone-Eureka and Elko Resource Management Plans would be adopted as part of the Proposed Action to further BLM's policy objectives of: 1) ensuring a system for transmission of utilities through a resource area, and 2) minimizing adverse environmental impacts by concentrating compatible rights-of-way in designated corridors that avoid sensitive resources.

- **Amendment of the Shoshone-Eureka Resource Management Plan** to designate a new utility corridor up to three miles wide (except where constraints exist) along the Falcon to Gonder project Pine Valley (a) route alternative and to delete the existing utility planning corridor along Highway 305.
- **Amendment of the Elko Resource Management Plan** to designate a new utility corridor up to three miles wide (except where constraints exist) along the Falcon to Gonder project

Pine Valley (a) route alternative and to modify a previous decision and allow the transmission line to cross the existing "low visibility" corridor along Interstate-80.

Designation of this new utility corridor and elimination of a planning corridor is intended to minimize the proliferation of dispersed rights-of-way by indicating the BLM's preferred location. Designation does not mean that future rights-of-way are restricted to corridors, nor does it indicate a commitment by the BLM to approve all right-of-way applications within corridors. Corridors provide for a variety of uses, including power lines, pipelines, railroads and highways. Subsequent projects seeking to locate in the utility corridor would be required to undergo additional environmental review pursuant to the National Environmental Policy Act. Future utility projects in the corridor, if any, could be expected to create roughly the same types of impacts as the Falcon to Gonder project and could be subject to similar mitigation measures.

BLM established the following planning criteria to evaluate the Resource Management Plan amendments and finds that the proposed amendments are consistent with the criteria:

- Emphasize a balanced multiple-use approach to land management, protecting fragile and unique resources, yet not overly restricting the ability of other resources to provide economic goods and services.
- Ensure a system for transmission of utilities through the Resource Management Planning Areas that would allow for future expansion by multiple users.
- Minimize adverse impact to the environment by concentrating compatible rights-of-way in designated corridors that avoid sensitive resource values.
- Select the preferred alternative based on a combination that best meets demands for public lands while minimizing disruption of the human environment.

The BLM plans to amend the two Resource Management Plans that would be affected by the selected alignment.

PUBLIC REVIEW OF DRAFT EIS

This Draft EIS has been distributed to a variety of federal, state and local government agencies, elected officials, environmental organizations, local community groups, Native American tribes, and other interested parties for review and comment. The public comment period extends from May 25 to August 22, 2001. Written comments on the Draft EIS are encouraged and must be submitted by August 22, 2001, to the following address:

Mary Craggett, Project Manager
U.S. Bureau of Land Management – Battle Mountain Field Office
50 Bastian Road
Battle Mountain, NV 89820

BLM and the cooperating agencies will review these comments and prepare a Final EIS, which will also be made available for public review. Following the Final EIS and its associated public review period, the BLM will issue a Record of Decision on the proposed action.

Sierra Pacific Power Co.

FALCON to GONDER Project

Existing BLM Corridors *

BLM Corridor Types

- Designated Utility Corridor
- Planning Corridor
- Low Visibility Corridor (per Elko RMP)

* From Shoshone-Eureka, Elko, and Egan Resource Management Plans

- BLM District Boundary
- Route Alternatives
- Existing Transmission Line

Scale 1 : 950,400

Kilometers 5 0 5 10 15 20 25 30

Miles 5 0 5 10 15 20

1" = 15 miles

GIS Mapping by EDAW, Inc. – San Francisco 4/25/01

Sources: BLM Land Tenure Adjustments and Corridors - Recommendations 1986 / EDAW, Inc. 2000 / Stantec 1999

Figure ES - 2

CHAPTER 1

INTRODUCTION/PURPOSE OF AND NEED FOR THE ACTION

1.0 INTRODUCTION/PURPOSE OF AND NEED FOR THE ACTION

The U.S. Bureau of Land Management (BLM) has prepared this Draft Environmental Impact Statement (EIS) to analyze potential environmental impacts associated with the construction of a new 345 kilovolt (kV) electric transmission line running between the Falcon and Gonder substations in north central Nevada. The project would also involve the expansion and installation of additional equipment at the existing Falcon and Gonder substations. This Draft EIS analyzes the environmental effects of the Proposed Action and the No Action Alternative.

The Proposed Action would:

1. Approve a right-of-way (ROW) application submitted by Sierra Pacific Power Company (SPPC) to construct, operate, and maintain a 165-185 mile long 345 kV transmission line from the Falcon substation to the Gonder substation and expand the two substations (five route alternatives are analyzed in this EIS); and

2. Amend relevant BLM Resource Management Plans (RMPs) to designate a new utility corridor along the transmission line route, delete an existing planning corridor along Highway 305, and modify a decision to allow the transmission line to cross a low visibility corridor along Interstate 80.

1.1 AUTHORITY AND JURISDICTION

This EIS addresses project-related impacts pursuant to the requirements of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321 et seq., and subsequent implementing regulations issued by the Council on Environmental Quality (CEQ) (40 CFR 1500-1508). The EIS was also prepared in conformance with the BLM's NEPA Handbook (BLM Handbook H-1790-1). The BLM Handbook provides instructions for compliance with the CEQ Regulations for implementing the procedural provisions of NEPA and the Department of the Interior's (DOI) Manual on NEPA (516 DM 1-7). This EIS also complies with procedures for Resource Management Plan Amendments found in 43 CFR 1610.

The BLM is the lead federal agency, responsible for both reviewing SPPC's application and amending relevant RMPs when necessary. The project would occur predominantly on public lands managed by the BLM in the Shoshone-Eureka, Elko, and Egan planning areas. The BLM has prepared RMPs to manage resources on these lands. The BLM will need to amend two of these RMPs, depending on which route alternative is selected, because portions of the proposed transmission line would extend beyond BLM-designated utility corridors and cross a low visibility corridor along Interstate 80. Therefore, this EIS also analyzes the effects of proposed RMP amendments (see Chapter 5). The BLM Nevada State Director is the authorized officer for the RMP Amendments.

1.2 PURPOSE OF AND NEED FOR THE PROJECT

Demand for electricity in the western United States continues to grow along with increased population and development, as well as the expanding use of computers and other electronic equipment that has accompanied the new information-based economy. At the same time, this part of the country is facing an array of constraints in maintaining even existing levels of electric power production, such as efforts to improve aquatic habitats (e.g., for endangered salmon) that can in turn reduce the energy supplied by hydropower generation.

New transmission lines, such as the proposed Falcon to Gonder project, increase the flexibility of the power grid system. This allows SPPC and other utilities to share their power supply and transmission facilities, so that they can move electricity across the grid to different parts of the western United States as needed based on seasonal demand. The Falcon to Gonder project would increase SPPC's operational flexibility and meet future customer demands. The project is being proposed now to avoid potential blackouts and service interruptions that could result from projected transmission capacity deficiencies during peak demand.

Based on a forecast of future load requirements, SPPC's current infrastructure will not be able to reliably meet the recommended level of planning reserve for existing or future periods of peak demand. Forecasts of SPPC's firm import requirements show a deficiency in import capacity of 238 MW in summer 2002, 300 MW in summer 2003, and 327 MW in summer 2004.

By providing a new link in the existing regional transmission system, the Falcon to Gonder project would help SPPC meet this expected increase by importing additional power during peak demand periods. The project would also benefit the region through greater flexibility for transmission service, export, reliability, and emergency response.

In a unanimous decision on April 8, 1999, the State of Nevada Public Utilities Commission (PUC) selected the Falcon to Gonder 345 kV line as the best option to meet northern Nevada's growing energy needs. If the Falcon to Gonder project is not approved, SPPC would immediately notify the PUC that it cannot comply with the Electric Resource Planning Opinion and Order of April 8, 1999, which found that the Falcon to Gonder 345 kV transmission project is in the public interest and is the best option to meet projected energy demands in SPPC's service area. SPPC and the PUC would then begin an emergency planning process to address the projected energy shortfalls.

To further explain the need for the project, this chapter provides background information on the regional transmission network and supply and demand forecasts. A glossary of technical terms and list of acronyms is also provided in Chapter 7 to assist the reader.

1.3 REGIONAL TRANSMISSION NETWORK OVERVIEW

Utility companies provide electricity to over 65 million people in western North America. To reliably provide this energy, western utility companies have constructed over 115,000 miles of transmission lines, ranging in voltage from 115 to 500 kV.

Customer Types

Utilities provide electricity to several types of customers. SPPC, for example, currently serves native load and transmission service customers. Traditional, native load customers served within a service area represent the highest percentage. Larger utilities also serve smaller utilities, which purchase power directly from a host utility or from third parties that transmit one system's power through the transmission facilities of another system. This is called "wheeling." A third type of customer purchases or has purchased rights on a continuing basis from a transmission owner. These customers can be other utilities, independent power producers or brokers.

Planning Reserve Requirement

In addition to providing electricity to its customers, a utility must also satisfy a "planning reserve requirement" – the amount of excess energy that should be immediately available to maintain reliability of the system during an unplanned loss of a source. The Western Systems Coordinating Council (WSCC) defines different types of reserves. SPPC uses a conservative reserve requirement calculated on the basis

of a loss of its largest generating unit plus 5% of native load. Thus, this requirement grows as the demand for electricity grows.

Power Sharing

In the past, utilities typically relied on their own generation resources to serve customer needs. However, some utilities now rely on the regional network to import power instead of generating their own – allowing them to choose less expensive, yet reliable power for their customers. Transmission system interconnections make power imports possible and allow regions with different seasonal load and generation demands to support one another. For example, the Desert Southwest is a summer-peaking load area, while the Pacific Northwest's peak loads come in the winter.

Power Pools

Transmission interconnections also aid the formation of power pools. In pools, utilities share reserve supplies and other services. During emergency situations, utilities can rely on emergency flows and support from neighbor utilities for short periods of time.

Cost and Capacity Information

The Federal Energy Regulatory Commission (FERC) Orders 888 and 889, issued in 1996, help utilities obtain easier access to markets through existing and new transmission interconnections. In tariffs filed with the FERC, owners of transmission facilities were required to make public the cost of using their transmission systems for various services. This lets transmission users evaluate the true cost of using interconnections and select their resources accordingly. Transmission owners were also required to place information about the available transmission capacity (ATC) for their transmission network on the Internet.

Role of the Western Systems Coordinating Council

The WSCC was formed in 1967 to help member utilities, such as SPPC, operate and plan the bulk electric system in the western United States (see Figure 1-1) and portions of Canada and Mexico. The WSCC is one of nine reliability councils under the North Electric Reliability Council.

WSCC committees aid utilities by monitoring and setting guidelines for new transmission projects. These guidelines help utilities establish ratings for transmission projects and require utilities to assess whether the addition of a new project would have any detrimental reliability impacts on existing facilities. WSCC currently has a three-phase rating process for new or upgraded transmission paths.

On November 10, 1998, SPPC's Falcon to Gonder project entered Phase I of the rating process by submitting a letter to WSCC members announcing the project and describing its scope. Because the project would support an existing interconnection between Nevada and Utah – and is not a new interconnection – SPPC is pursuing a new rating of its existing eastern path. SPPC submitted its "Falcon to Gonder 345 kV Project Comprehensive Progress Report" to the WSCC on March 22, 1999. With WSCC's acceptance of this report on August 27, 1999, the project moved into Phase II of the rating process.

Phase II involved detailed planning studies and review by a group of seventeen western utilities. The group of member utilities accepted the Phase II re-rating report on November 5, 2000. The report was then submitted to the WSCC for a 30-day comment period, and a letter completing the WSCC rating process was issued on December 15, 2000. This process determined what the Falcon to Gonder project's operational capabilities would be.

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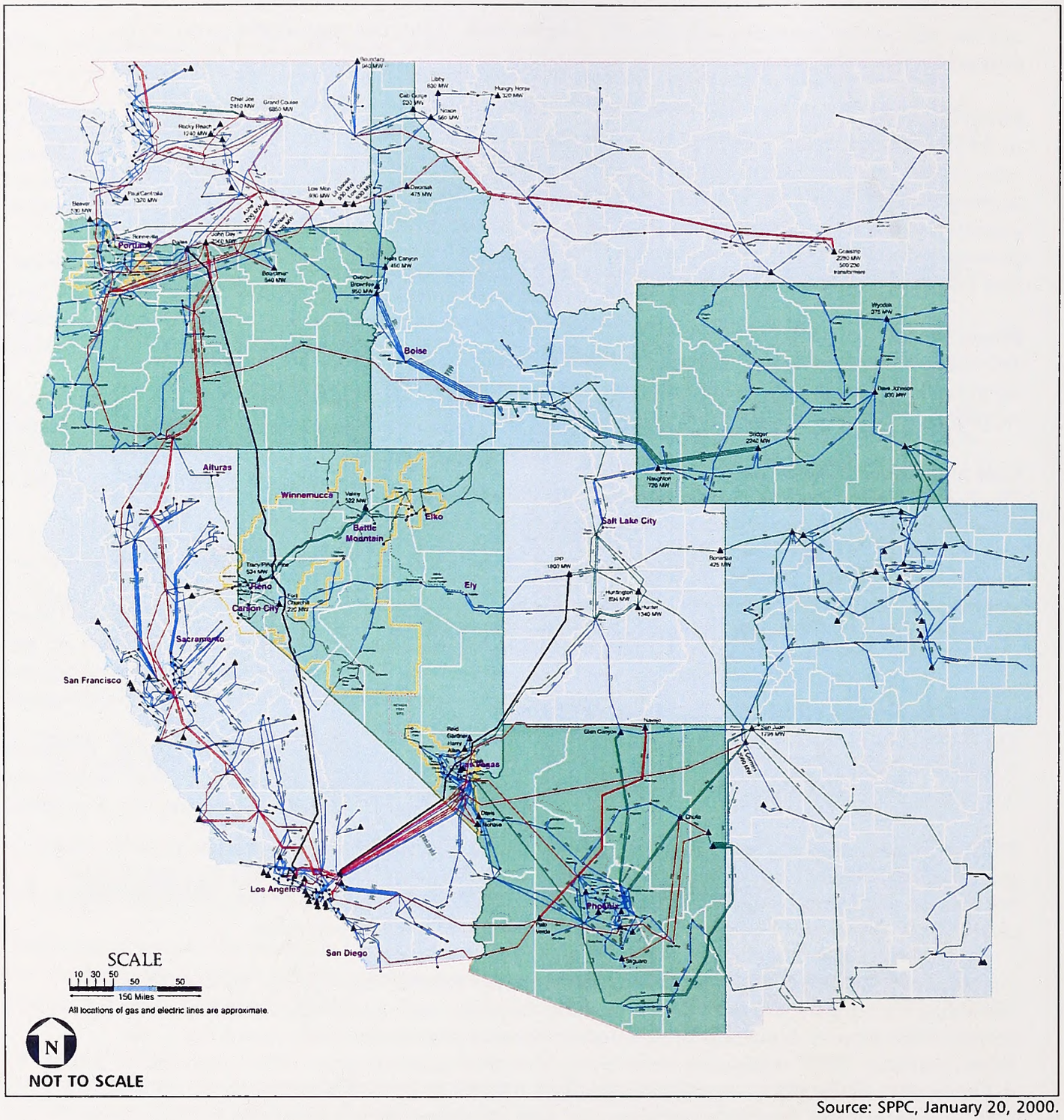


Source: SPPC, January 20, 2000.

LEGEND

- kv Below 230 KV
- kv 230 to 287 KV
- kv 345 KV
- kv 500 to 525 KV
- kv Above 525 KV
- kv Proposed Line (in color of KV)
- Substation
- Generation

SPR Service Territory

Figure 1-1
Major Electric Transmission Lines in the Western U.S.

Relation to Electric Energy Restructuring in Nevada

Like many states, the State of Nevada (through proposed enactment of Senate Bill 438 [1999]) has embarked on a program of electric energy restructuring (popularly misnamed "deregulation"). In the past, in most of Nevada, energy was produced, transmitted through high voltage power lines and distributed to customers by a single, investor-owned utility (i.e., either SPPC or Nevada Power). These two utilities merged in April 1998.

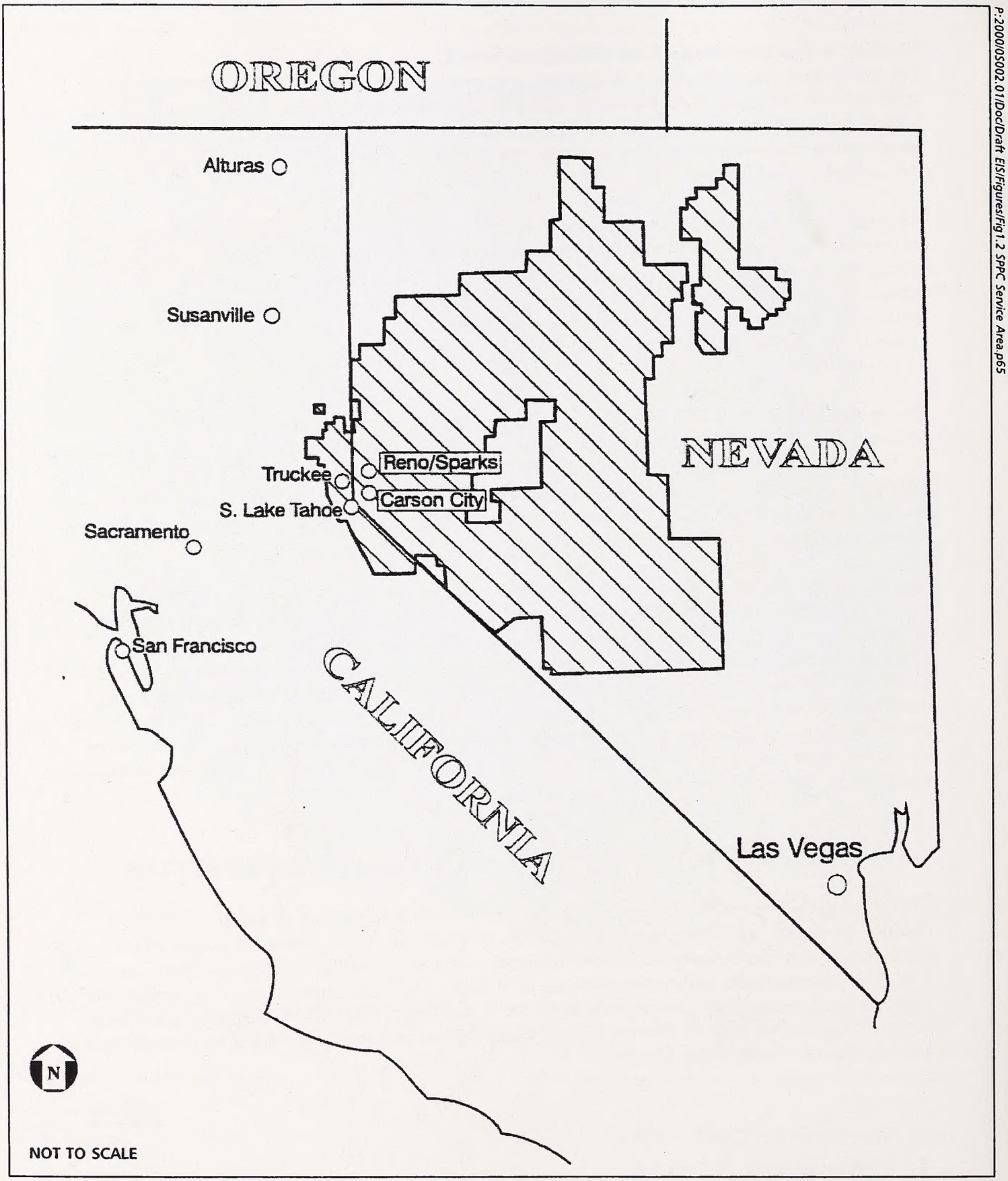
Through energy restructuring, Nevada's retail electricity business would be opened to competition and customers would be able to choose their electricity providers from competing utilities. The services of energy generation, transmission and distribution would be "unbundled". Other energy providers would generate power. SPPC and Nevada Power would sell their Nevada power stations, and would no longer generate electric power in Nevada, but they would continue to operate and maintain the electric transmission and distribution system. The Falcon to Gonder Transmission Project would become part of that transmission system.

The in-state energy generators will continue to be regulated by the Federal Energy Regulatory Commission (FERC). SPPC and Nevada Power, and any generation owned by either company, would be regulated by FERC and the State of Nevada PUC. The Governor, State of Nevada's Bureau of Consumer Protection, and State Legislature are closely reviewing the current law (Senate Bill 438), and seeking ways to avoid the recent problems of high rates and power shortages experienced in California that resulted in part from a flawed energy restructuring policy and program.

The project has no direct relationship to energy restructuring in Nevada. The project's purpose and need statement indicates that it would be needed with or without energy restructuring. Were the Falcon to Gonder Project approved, it would not affect the outcome of Nevada's energy restructuring policy. Construction and operation of new transmission lines by SPPC would be consistent with the mandates of Senate Bill 438. Similarly, because the project does not entail construction of new power generating stations, it would not conflict with the proposed energy restructuring policy in which SPPC and Nevada Power would not operate their own power plants in Nevada. Under energy restructuring, alternative energy producers would pay SPPC or Nevada Power a fee for using the transmission system to transport electricity to their retail customers.

1.4 SIERRA PACIFIC POWER COMPANY'S TRANSMISSION SYSTEM

SPPC is an investor-owned utility based in Reno, Nevada, that is engaged in all aspects of electrical energy – generation, purchase, transmission, distribution, and sale. SPPC serves more than 250,000 retail customers in northern Nevada and eastern California – an area exceeding 50,000 square miles (see Figure 1-2). SPPC also provides transmission service, or "wheeling," to other utilities, including the Bonneville Power Administration (BPA), which delivers power to the Wells Rural Electric Company and Harney Electric Cooperative, Inc.; Mt. Wheeler Power, which delivers power to Ely and Eureka, Nevada; and the Truckee Donner Public Utility District.



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Source: SPPC

Figure 1-2
Sierra Pacific Power Company's Service Area

The SPPC system is interconnected to the WSCC system through the following transmission lines (Figure 1-3):

- One 345 kV line from Humboldt, Nevada to Idaho Power Company (IPC)
- One 345 kV line from Reno to BPA
- One 230 kV line from Gonder to PacifiCorp (merger of Pacific and Utah Power and Light)
- One 230 kV line from Gonder to Intermountain Power Project (IPP)
- Two 120 kV lines and one 60 kV from Reno to Pacific Gas & Electric (PG&E)
- Two 55 kV lines from Silver Peak, Nevada to Southern California Edison Company (SCE)

1.4.1 FORECASTS OF SPPC'S SYSTEM DEMAND/LOAD

In 1999, SPPC sold 8,384 gigawatt-hours (gWh) and had a system peak load of 1,470 megawatts (MW). SPPC's 1998-2017 Amended Electric Resource Plan (ERP) forecasted energy sales of 9,884 gWh by 2004 with a system peak demand of 1,647 MW. A February 2000 load forecast update is included in the 1998-2017 ERP Status Report that SPPC filed with the State of Nevada PUC.

This updated forecast shows energy sales in 2004 increasing to 10,133 gWh with peak demand at 1,729 MW. Table 1-1 and Figure 1-4 present SPPC's projected growth in demand through the year 2004, as shown in the 1998 Amended ERP and the February 2000 Status Report.

TABLE 1-1: FEBRUARY 2000 LOAD FORECASTS (IN MW)

Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
1999	99/00	2000	00/01	2001	01/02	2002	02/03	2003	03/04	2004
1470	1319	1525	1452	1613	1535	1646	1560	1704	1613	1729

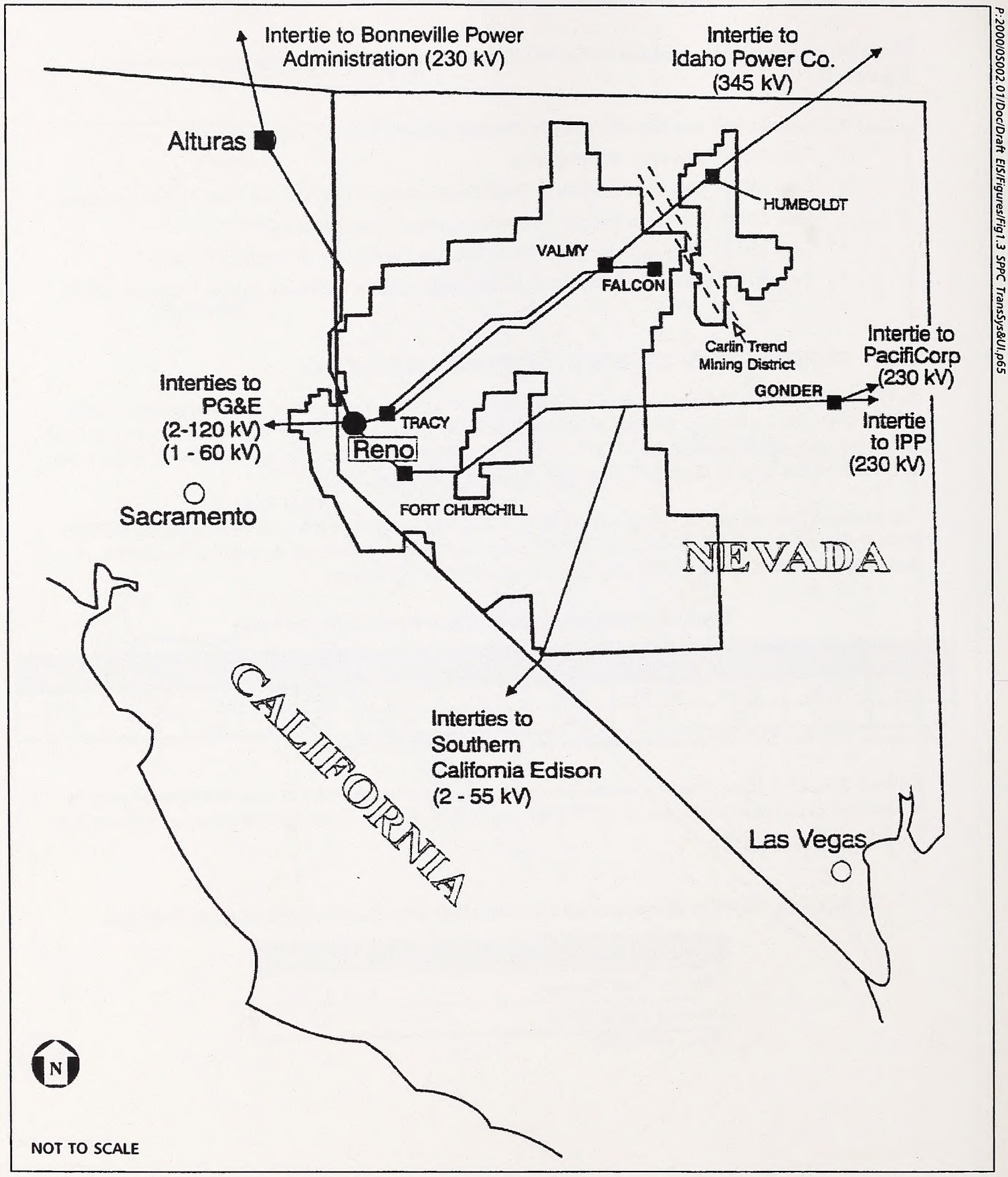
Data from the 1998-2017 ERP, with updated information from the February 2000 ERP Status Report.

Tables 1-2 and 1-3 show how the annual demand for electricity is expected to grow for selected periods and various customer sectors (see the 1998 ERP for further details). These growth rates are approved by the State of Nevada PUC.

TABLE 1-2: SPPC'S ANNUALIZED ELECTRIC GROWTH RATES FOR SELECTED PERIODS

	1999-2001	2001-2018
System Peak Demand	4.9%	2.7%
System Energy Sales	5.4%	2.2%

Source: SPPC 2000



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Source: SPPC

Figure 1-3

Sierra Pacific Power Company's Transmission System and Utility Interconnections

FIGURE 1-4: FEBRUARY 2000 LOAD FORECASTS

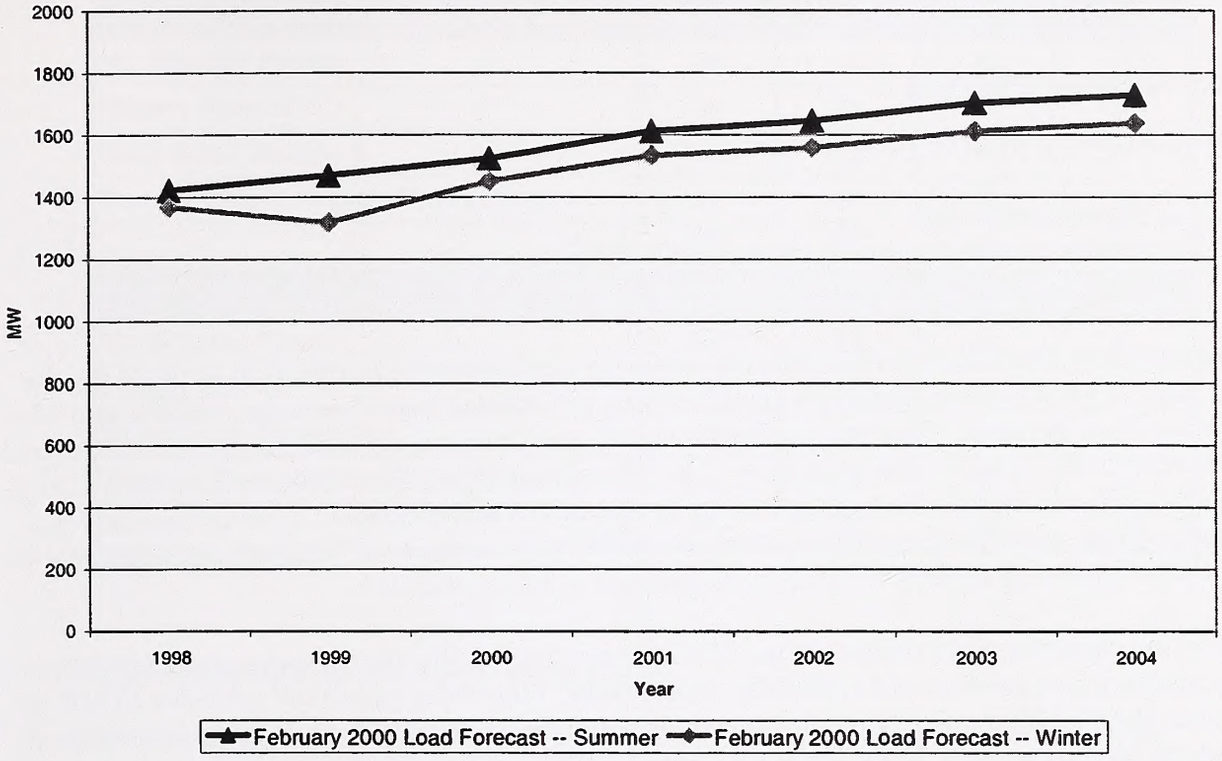


TABLE 1-3: SPPC'S ANNUALIZED ELECTRIC GROWTH RATES FOR CUSTOMER SECTORS

Sector	1999-2001	2001-2018
Residential	2.5%	2.0%
Mining	5.4%	-1.7%
Manufacturing/Warehousing	12.0%	7.5%
Gaming/Recreation	7.4%	3.2%
Office	1.6%	1.2%
All other Sectors	7.7%	3.4%

Source: SPPC 2000

SPPC'S ENERGY CONSERVATION PROGRAM

SPPC supplies electricity to meet demand, but in response to rising energy costs, their Energy Conservation Department has pursued a range of energy conservation and community education programs. The effort was mandated by the State of Nevada PUC and the effectiveness and costs were reviewed by them. Because of high operating costs and relatively minor benefits, the PUCN subsequently ordered the programs dropped a few years ago. Currently, in response to high wholesale energy prices, especially during peak periods, SPPC is re-establishing Energy Conservation Department programs.

A variety of energy conservation programs are being re-established or developed. The programs likely will include more energy audits, community education programs, additional web-based information, cost incentives or financing to install home attic insulation and energy efficient lighting, and possible new rate structures designed to encourage conservation. In February 2001, SPPC had an optional curtailment rate

approved by the State of Nevada PUC for large industrial customers (greater than 1 Megawatt). This provides a lower overall rate and allows SPPC to remove the load during certain use periods.

SPPC'S SUPPLY SYSTEM

SPPC supplies electricity from three sources:

1. Self-owned generation.
2. Non-utility purchases generated within SPPC's service area.
3. Imports purchased from other systems (through six transmission interconnections).

Potential electricity shortfalls and disruptions in service to customers are perhaps most likely during the summer peak. This is because demand is greatest during the extreme heat of summer, which is also when supply is harder to generate. Thermal generation sources produce more electricity when operated in cold winter weather than in warm summer weather. The temperature of the air outside the generators affects the efficiency of post-combustion cooling and the generator's overall efficiency. Cold air increases the generator's output, warm air decreases it. Therefore, SPPC power plants are "derated" approximately 4% below nominal operating capacity when they are operated in warm weather.

Looking at the capacities of its three sources, SPPC's internal generation resources can provide 1,045 MW of capacity in the summer and 1,088 MW in the winter. Non-utility generation provides 70 MW in the summer and 92 MW in the winter. System requirements in excess of the internal generation must be imported. In accordance with WSCC operating criteria, SPPC's ability to import power is limited to a simultaneous rating that depends on conditions in neighboring systems. SPPC is currently limited to 660 MW in imported electricity. The limit would be increased if the Falcon to Gonder project were added to the system.

SPPC's total supply limit is determined by adding the capacity of the three sources together:

Summer : 1,045 MW + 70 MW + 660 MW = 1,775 MW
Winter : 1,088 MW + 92 MW + 660 MW = 1,840 MW

WHEELING LOADS

SPPC also supplies transmission wheeling services to wholesale customers – utilities located within its control area in northern Nevada and eastern California. SPPC passes along to these customers power that was generated by other companies' facilities located outside of SPPC's control area. These utilities contract with SPPC to transmit, or "wheel," power over SPPC's transmission lines. Increasing the capacity of the transmission system offers greater flexibility for utilities to wheel power to customers where and when it is needed most. Table 1-4 lists SPPC's wholesale customers and their summer/winter contracted uses.

TABLE 1-4: SPPC TRANSMISSION WHEELING DEMANDS (MW)

Summer Peak Wheeling Demand	2001	2002	2003	2004
Mt. Wheeler Power	40	40	40	40
Harney Electric	30	30	40	30
Wells Rural Electric 3	80	72	73	73
Truckee Donner Public Utility District	21	21	22	22
Total:	**171**	**163**	**165**	**165**
Winter Peak Wheeling Demand	**2001/02**	**2002/03**	**2003/04**	**2004/05**
Mt. Wheeler Power	22	22	22	22
Harney Electric	2	2	2	2
Wells Rural Electric 3	80	72	73	73
Truckee Donner Public Utility District	30	31	31	32
Total:	**134**	**127**	**128**	**129**

Source: SPPC 2000

SPPC'S SYSTEM RESERVE REQUIREMENTS

SPPC plans and operates its system in accordance with the WSCC Reliability Criteria that sets performance standards for WSCC members in assessing the interconnected system's reliability. To evaluate the relative reliability of the interconnected bulk power system, the WSCC developed Power Supply Design Criteria ("planning reserve criteria"), which provide guidance on the recommended minimum levels of installed and planned generation.

SPPC uses the following WSCC criterion to determine the recommended planning reserve for its system: The monthly reserve capacity after deducting scheduled maintenance should be equal to the largest Risk plus 5% of the utility's total load responsibility. For SPPC, this is equal to approximately 15% of SPPC's total load responsibility. "Risk" is the reduction in capacity caused by the outage of a single generator or transmission line.

Thus, SPPC's planning reserve ranges from 192 MW in winter 1999/2000 to 217 MW in summer 2004.

SPPC'S FORECAST FIRM IMPORT REQUIREMENTS

SPPC expects to have adequate resources to meet the forecast load requirements during the 2000-02 period, but would not be able to meet the recommended planning reserve level in Summer 2003. If the Falcon to Gonder project (or some other capacity improvement project) is not completed by the 2003 summer peak period, SPPC might be forced to curtail some customers during peak load conditions (e.g., rolling blackouts).

This conclusion is reached by examining the total capacity requirements for SPPC's control area, which consists of three components:

- SPPC System Demand/Load
- Non-SPPC Wheeling Loads
- System Reserve Requirements

The sum of these three components determines the total demand. When the total demand exceeds the internal generating resources, the additional requirements must be imported.

A forecast of SPPC's firm import requirements shows a deficiency in import capacity of 211 MW in summer 2001, 238 MW in summer 2002, 300 MW in summer 2003, and 327 MW in summer 2004. The forecast was submitted to the State of Nevada PUC in the 1998-2017 ER and revised on February 23, 2000, to include updated load forecasts and changes in project schedules. This updated forecast was included in the 1998-2017 ERP Status Report filed with the PUC on February 29, 2000.

If the Falcon to Gonder project is placed in-service, SPPC's eastern interconnection (WSCC Path 32) could flow approximately 400 MW east-to-west and 230 MW west-to-east. This would be a significant improvement over the current rating of 245 MW east-to-west and 150 MW west-to-east. Studies show that at these flow levels, there are no negative impacts on adjacent or remote systems, and WSCC reliability planning criteria are met or exceeded.

SPPC'S SYSTEM LIMITATIONS

During peak load conditions, SPPC's existing transmission system does not have adequate capability to serve existing and forecast customer loads in accordance with the WSCC Reliability Criteria. This limitation affects both retail and wholesale customers. Because SPPC has limited access to economical power supplies, retail (or "native load") customers will see reduced reliability and higher energy costs. For wholesale (or "transmission service") customers, their import capability and reliability is reduced, which in turn affects their own customers.

As load demand continues to grow, it would not be possible to serve all customers during peak load conditions without the Falcon to Gonder project, or some other capacity improvement project. Unable to serve all their customers at the same time, SPPC may have to initiate rolling blackouts during peak loading conditions. With existing facilities, SPPC's net system import is limited to 660 MW – which leads to a 300 MW forecast deficiency in import capacity in Summer 2003. By Summer 2004, the capacity deficiency increases to 327 MW, unless additional facilities are constructed.

To address its system limitations, SPPC is required by the State of Nevada to file an ERP with the State of Nevada PUC every three years. This plan includes a 20-year forecast of customer's electric power demand and energy consumption. The ERP integrates energy conservation and load management measures, and presents an approach to obtain supplies of electricity through new facilities to meet these customer needs. The PUC's Opinion and Order provides the mandate for action until it is either revised in an amendment or replaced by the next ERP three years later.

SPPC addressed the limitations discussed in this section in its December 15, 1998, Amended ERP. The PUC issued its Opinion and Order on April 8, 1999, approving two transmission projects to relieve SPPC's forecast capacity deficiencies:

1. The Falcon to Gonder project, which would provide 260 MW of additional import capacity; and

2. The Frenchman Tap project, which would provide 30-35 MW of additional import capacity. This project is currently awaiting a FERC decision on SPPC's FERC 210 Application to interconnect to Oxbow Geothermal Corporation facilities – which is opposed by Oxbow. The project schedule estimates a mid-2002 in-service date.

1.4.2 PRIMARY OBJECTIVES AND DESIGN

PRIMARY OBJECTIVES

In addition to improving the utilization of existing facilities, the Falcon to Gonder project would increase SPPC's import capability by 260 MW for its entire system by strengthening SPPC's eastern interconnection with PacifiCorp and the Los Angeles Department of Water and Power (LADWP). The project would also improve access to markets in Utah, the Desert Southwest, and other markets throughout the WSCC region. Because northern Nevada's weather conditions differ from those of these regions, each region experiences its peak demand and peak capacity at different times of the year – meaning opportunities for power exchanges with other utilities are greater.

PROJECT DESIGN

The new Falcon to Gonder transmission path would provide SPPC with an interface with the PacifiCorp and LADWP control areas (see Figure 1-5). The path includes two 230 kV transmission lines – the Gonder-Pavant 230 kV and the Gonder-IPP 230 kV line. Built in 1975, the Gonder-Pavant line is co-owned by SPPC and PacifiCorp. The line's ownership is divided at the border between Nevada and Utah. The Gonder-IPP line, constructed in 1986, is owned by a consortium of utilities, which also own the IPP. LADWP is the operator of the IPP.

The Gonder substation, near Ely, Nevada, is owned by Mt. Wheeler Power (Mt. Wheeler). It was built under an agreement between SPPC and Mt. Wheeler to supply power to Mt. Wheeler and import power into SPPC's system. SPPC owns the voltage control equipment (230 kV and 13.8 kV reactors, circuit switchers, and vacuum switches) and operates the transmission interconnection for both parties. All other equipment is owned and operated by Mt. Wheeler or the IPP. Both substations are located in SPPC's control area.

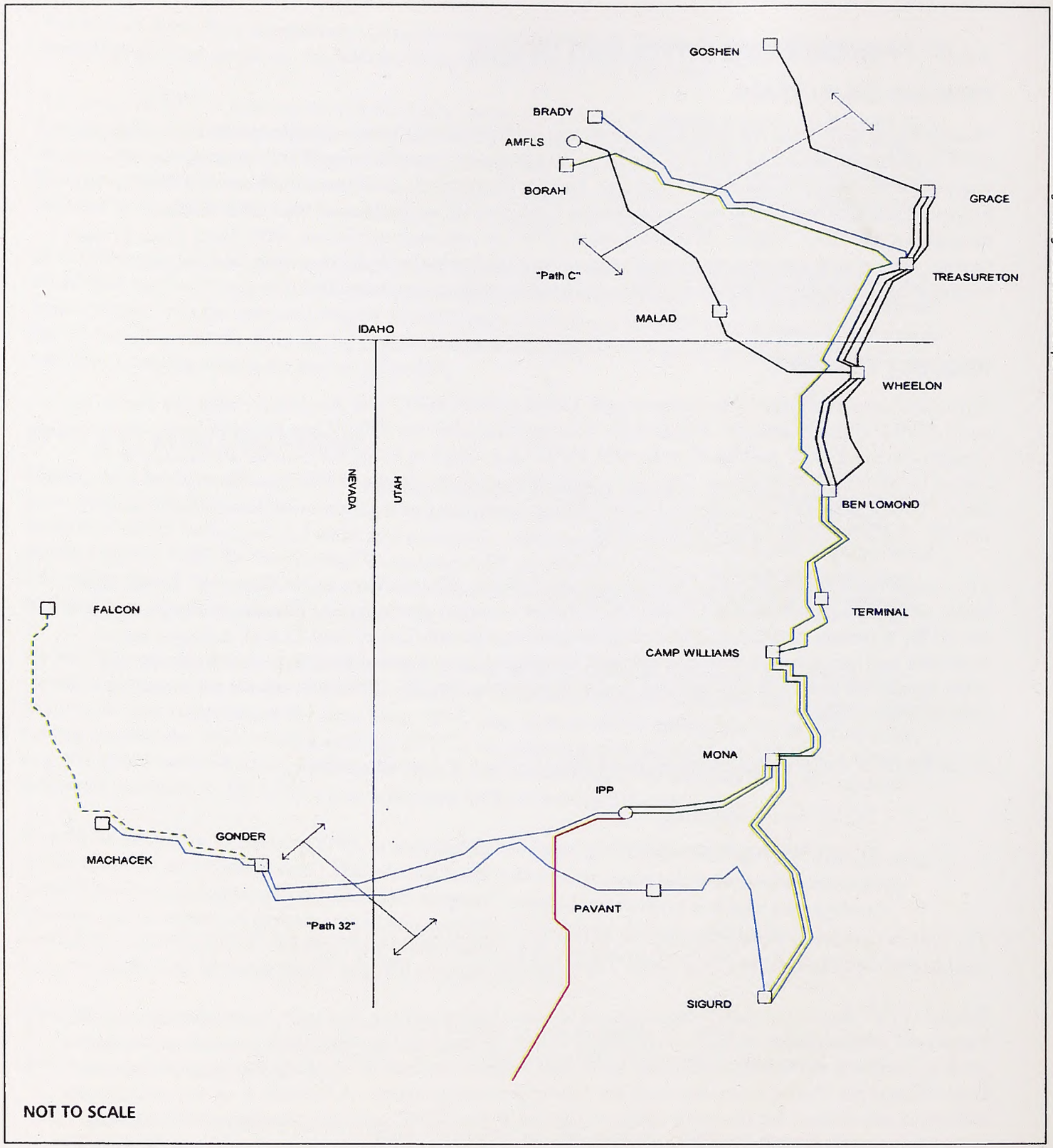
There are three major components of the proposed Falcon to Gonder project:

- 345 kV transmission line
- Falcon substation expansion
- Gonder substation expansion

The Falcon substation was selected as one end of the transmission line because it already contains 345 kV facilities and is located close to the Carlin Trend mining area. In 1994, SPPC constructed the Valmy-

Falcon 345 kV line to provide voltage support to serve load growth in the Carlin Trend mining area. The Falcon to Gonder project would provide more voltage support and another 345 kV source to the area. Ending the line at the Falcon substation would also improve the use of 36 miles of existing 345 kV line that connects the Falcon substation with the Valmy generating station. A location at or near the Gonder substation was chosen for the other terminus because it is at SPPC's easterly boundary and an existing interconnection point with PacifiCorp's and IPP's control areas. SPPC proposes to add two 345/230 kV 300 MVA transformers to the Gonder substation's existing facilities.

Initial technical and economic studies evaluated the import capability improvement of operating the line at 230 kV verses 345 kV. The import improvement was approximately 30 MW greater operating at 345 kV than at 230 kV. The voltage support provided to the Carlin Trend area would also be greater at the 345 kV voltage level. The 345 kV voltage level increases opportunities for wheeling power with other utilities.



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Source: SPPC , Alturas EIR, 1995.

LEGEND

- IPP DC
- 345 kV LINE
- 230 kV LINE
- 161 kV & below
- Falcon-Gonder Project

Figure 1-5

Eastern Nevada-Northern Utah Transmission System

1.4.3 PRIMARY PROJECT BENEFITS

INCREASED IMPORT CAPABILITY

Forecast peak demand increases for SPPC's native load customers and the need to maintain adequate reserve requirements are driving the need to increase import capability. Meeting that need is the project's most important benefit. With the addition of the project, SPPC's total system import capacity grows to 920 MW – an increase of 260 MW over the current 660 MW limit. SPPC's eastern interconnection rating would increase to approximately 400 MW (east-to-west), up from 245 MW.

Electrical constraints, such as thermal overloads, transient voltage dips, or post-transient voltage dips, restrict SPPC's import capability either within or just outside its service territory. When SPPC performs planning and operating studies, certain buses (electrical load centers) are monitored for dips in voltage, and certain lines and/or interconnections are monitored for emergency flows (see Table 1-5). These electrical constraints are a combination of WSCC planning criteria, neighboring utilities criteria, and SPPC's own planning criteria.

Each transmission line into SPPC's control area has a rating. The sum of these ratings is 1,170 MW. Because of the constraints previously mentioned, SPPC currently can only import 660 MW. Different analyses are conducted to determine individual transmission line ratings and define SPPC's import limit. These tools, along with the criteria in Table 1-5, are what have been used in studies to re-rate SPPC's eastern interconnection (Path 32).

TABLE 1-5: INDIVIDUAL TRANSMISSION LINE RATINGS

Element	Rating
Drum-Summit 115 kV & 60 kV	108 MW
Gonder-Pavant 230 kV and Gonder-IPP 230 kV (Path 32)	245 MW
Humboldt-Midpoint 345 kV	500 MW
Silver Peak-Control 1 & 2 55 kV	17 MW
Hill Top-Bordertown 345 kV	300 MW
Total:	**1,170 MW**

Source: SPPC 2000

ACCESS TO POWER MARKETS

This increased import capacity would increase access to more economical energy markets and allow greater flexibility to react to regional need, market availability, and price. The project would increase the capacity of interconnections with PacifiCorp and the IPP at the Gonder substation. It would also improve SPPC's ability to utilize existing transmission lines, allowing additional purchases from neighboring utilities over any of SPPC's existing lines.

Native load demands peak during both the summer and winter months in SPPC's service territory. The Falcon to Gonder project would provide better access to Pacific Northwest markets during the summer and to Desert Southwest markets during the winter. The increase in SPPC's import capability could be utilized throughout the year to purchase power through one of three types of purchases – non-firm purchases and firm purchases of either short-term or long-term duration.

Non-Firm Purchases

Non-firm purchases are made through agreements in which power deliveries have limited or no assured availability. A non-firm purchase might come from a hydroelectric power supply when there is an abundance of water supply from precipitation. This power cannot be guaranteed for delivery on a continuous basis. The Pacific Northwest, with its reliance on hydroelectric power, can be a significant market for non-firm purchases. Many opportunities for non-firm purchases are expected to be available from less expensive sources through the additional import capability supplied by the project.

Firm Purchases

Firm power purchases are contracted, either on a short- or long-term basis, and are intended to have assured availability to the purchaser. Long-term purchases of power are made under contracts extending for one or more years. Short-term firm purchases are typically a few hours to a few months to meet load requirements and maintain operating reserve requirements. Most of the future load growth for SPPC's system over the next few years would be met with short-term firm purchases until additional generation resources are added.

1.4.4 SECONDARY BENEFITS AND OBJECTIVES

The Falcon to Gonder project would create a number of other secondary benefits, including:

- New transmission service
- Export benefits
- Communication benefits
- Improved reliability to the 230 kV system
- Emergency response

NEW TRANSMISSION SERVICE

While serving the needs of its transmission customers (i.e., Harney, Wells Rural Electric, Truckee Donner Public Utility District, and Mt. Wheeler), SPPC has requests from other parties wanting access into, out of, or through SPPC's service territory. Many of these requests for transmission service had to be refused due to a lack of capacity. Although it is difficult to estimate the value of these services, up to 250 MW of short-term transmission service (not counting the independent power producer interests) could be accommodated with the addition of the project that otherwise could not be accepted.

EXPORT BENEFITS

Independent power producers have expressed an interest in building within SPPC's service territory. SPPC's present export capability is approximately 300 MW, but could be increased to 500 MW with the addition of the Falcon to Gonder project. If SPPC divests its generation, or other non-utility in-state generation projects are built, the owners of SPPC's former plants or these new plants may wish to export power to buyers outside Nevada. This also drives the need for SPPC to expand the transmission network's ability to export power.

COMMUNICATION BENEFITS

The ability to efficiently control and monitor substation and power line facilities is important to safely and reliably operate an electrical system. The communication to existing facilities along SPPC's 230 kV

transmission line between Yerington and Ely, Nevada, is almost entirely done with a power line carrier system (i.e., a method of communicating by superimposing a signal on the transmission line conductors). This system has been used since the line was built in 1975, and SPPC has considered replacing or upgrading it for a number of years. The Falcon to Gonder project provides the opportunity for SPPC to improve its existing communication system at Gonder substation by leasing high capacity digital communication circuits from a local area provider, such as Nevada Bell. Improving the communication system at Gonder substation with a new lease line would provide a more efficient and redundant communication network to this part of the system, which would greatly enhance SPPC's ability to control and monitor this part of the system.

IMPROVED RELIABILITY TO THE 230 KV SYSTEM

The Falcon to Gonder project would also enhance performance of the Austin 230 kV bus and improve reliability for all customers served by the 230 kV system.

EMERGENCY RESPONSE

The Falcon to Gonder project provides SPPC with a greater chance of being able to withstand a reasonably sever outage (e.g., one week) of its largest transmission element: the 345 kV line to Idaho. During the loss of this line, which is SPPC's main line for importing power, the Falcon to Gonder line would provide increased capacity to SPPC's eastern interconnection over the existing 230 kV lines from Utah. Presently, with the loss of the 345 kV line to Idaho, SPPC's system import capacity is limited to 360 MW, but after construction of the Falcon to Gonder project, this would increase to 520 MW, an increase of 160 MW.

BENEFITS TO MT. WHEELER POWER

The addition of the Falcon to Gonder project would help Mt. Wheeler improve service reliability and security for its customers by providing their supplier, Deseret Generation and Transmission, another transmission path to deliver energy. This could be beneficial during emergency or scheduled outages along their normal transmission path. Another benefit is related to the project's proposed improvements and upgrades to some of the existing 230 kV facilities at the Gonder substation. Some of these facilities are over 25 years old and the proposed improvements would increase the substation's reliability and operational felxibility.

1.5 PERMITS

This EIS and RMP Amendments document should also be useful for other agencies with related interests or permitting authority over the project. Permits that may be required as part of the project are listed below. Regulatory agencies may identify the need for additional permits as the project progresses.

- Grading Permits (Elko, Lander, and Eureka counties)
- Cultural Resource Use Permits: (1) Survey/Recordation Permit, (2) Survey and Limited Testing Permit, and (3) Excavation and/or Removal Permit (BLM)
- Occupancy or Encroachment Permits (Nevada Department of Transportation)
- Federal Aviation Administration Obstruction Notice (Federal Aviation Administration)
- Nationwide Permit 14, 404/401 Permit (U.S. Army Corps of Engineers)
- Section 401 Water Quality Certification (Nevada Bureau of Water Quality Planning)

- Utility Environmental Protection Act Permit (State of Nevada PUC)
- Temporary Rolling Stock Permit (Nevada Bureau of Water Pollution Control)
- Surface Area Disturbance Permit (Nevada Bureau of Air Quality)
- Stormwater General Permits for Construction, National Pollutant Discharge Elimination System (NPDES) (Nevada Bureau of Water Pollution Control)
- Air Quality Operating Permit (Nevada Division of Environmental Protection)
- Surface Area Disturbance Permit (Nevada Division of Environmental Protection)
- Temporary Rolling Stock Permit (U.S. Environmental Protection Agency; Nevada Division of Environmental Protection)
- Right-of-Way Grant – Transportation and Utility Systems and Facilities on Federal Lands (BLM)
- Temporary Use Permits for construction-related activities (BLM)
- Permit for Construction of a Utility Facility (State of Nevada PUC)

1.6 RESOURCE MANAGEMENT PLAN CONFORMANCE STATEMENT

As some portions of the Falcon to Gonder project would extend outside of BLM designated utility corridors and cross a low visibility corridor along Interstate 80, the project would not be in conformance with BLM Resource Management Plans. Therefore, plan amendments are required. These amendments are described and evaluated in Chapter 5 of this EIS.

CHAPTER 2

DESCRIPTION OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION

The "Proposed Action" is for BLM to approve a right-of-way (ROW) application filed by Sierra Pacific Power Company (SPPC) on December 17, 1998, to construct, operate, maintain, and terminate a new 345 kV transmission line on federal public land in north central Nevada. The transmission line would provide a new connection between the existing Falcon and Gonder substations. While the transmission line would be located primarily on federal public land, it would also cross some private land. BLM's authority is limited to the portion that would cross federal land. The BLM right-of-way grant would be for a term of 30 years, after which time SPPC could apply to renew the grant or terminate it. The Proposed Action also involves amendments to related BLM Resource Management Plans, which are discussed further in Chapter 5.

Five route alternatives are being considered as possible locations for the new 345 kV transmission line connecting the Falcon and Gonder substations.

- Crescent Valley (a) route alternative
- Crescent Valley (b) route alternative
- Pine Valley (a) route alternative
- Pine Valley (b) route alternative
- Buck Mountain route alternative

As described in detail in Section 2.2, these alternatives are made of different combinations of potential route segments (i.e., Segments A-J), as well as two re-route options being considered to avoid sensitive resources along Segment B (i.e., K and L re-routes).

Construction of this transmission line would also require expansion and upgrading of the existing Falcon and Gonder substations. The Falcon substation is located on land owned by SPPC. The Gonder substation is located on federal public land developed through an existing right-of-way grant issued to Mt. Wheeler Power, which would be amended to authorize the substation improvements. However, the existing right-of-way property boundary would not change, as it is sufficient to accommodate the Gonder substation expansion. Thus, the Mt. Wheeler right-of-way grant amendment would be for the additional facilities, but not for any additional land.

The BLM would be issuing a new right-of-way grant for those portions of the transmission line that cross federal public land (see Table 2-1 for the right-of-way length and acreage to be authorized by the BLM). However, this EIS analyzes the environmental consequences of the entire project (i.e., the transmission line and the substation improvements). It also examines the implications of the amendments to the related BLM Resource Management Plans in Chapter 5, as well as the No Action Alternative described below.

The end of this chapter provides a brief discussion of alternatives that were considered early in the planning process but were eliminated from further review.

TABLE 2-1: EXTENT OF RIGHT-OF-WAY ON FEDERAL PUBLIC LAND TO BE AUTHORIZED BY BLM

Route Alternative	Total BLM ROW Length (miles)	Total BLM ROW Area (acres)	ROW in BLM Battle Mtn Field Office (Shoshone-Eureka Planning Area)		ROW in BLM Elko Field Office (Elko Planning Area)		ROW in BLM Ely Field Office (Egan Planning Area)	
			miles	acres	miles	acres	miles	acres
Crescent Valley (a)	155.06	3,007	95.04	1,843	4.62	90	55.40	1,074
Crescent Valley (b)	155.52	3,016	95.50	1,852	4.62	90	55.40	1,074
Pine Valley (a)	145.75	2,827	53.89	1,045	36.46	707	55.40	1,074
Pine Valley (b)	146.21	2,836	54.35	1,054	36.46	707	55.40	1,074
Buck Mountain	135.96	2,637	2.21	43	44.13	856	89.61	1,738

The right-of-way (ROW) would be 160 feet wide in all cases. Note: A 12-foot wide, two-track, centerline travel route would be used for annual inspections and as-needed maintenance. Generally, it would be located next to the transmission line and within the right-of-way. Some exceptions could occur in steep and rough terrain; this would be clarified and mitigated appropriately through the COM Plan.

2.1 PROPOSED ACTION

2.1.1 OVERVIEW OF THE PROJECT

Sierra Pacific Power Company (SPPC) is proposing to construct a new 345 kV electric transmission line in north central Nevada. It would extend approximately 165-185 miles between the Falcon substation near Dunphy to the Gonder substation near Ely, as shown in Figure 2-1 and Figure ES-1 in the Executive Summary. The transmission line would be supported by approximately 725 to 820 tubular steel towers that would vary from 75 to 130 feet above ground level, depending on terrain (see Figure 2-2).

The project also involves expanding and installing additional equipment at the existing Falcon and Gonder substations. Figures 2-3 through 2-5 show the substations as they currently exist, and Figures 2-6 and 2-7 show the proposed expansions. The Falcon substation would be expanded by approximately 3.2 acres and the Gonder substation by about 6.2 acres. SPPC owns the Falcon substation and the surrounding 40 acres of property. The Gonder substation is on federal public land that was previously developed by way of a right-of-way grant issued to Mt. Wheeler Power. It is expected that the existing right-of-way property boundary is large enough to accommodate the substation expansion. The Gonder substation facilities are owned and operated by Mt. Wheeler Power and SPPC in accordance with transmission service and operating agreements signed by both parties.

BLM would issue a right-of-way grant authorizing SPPC to construct, operate, and maintain the transmission line across federal public lands administered by the BLM. The new transmission line, towers, and substation facilities would be owned and maintained by SPPC, but the actual ownership of the land would not change. Approximately 80% of the transmission line would cross public lands, while 20% would cross privately owned lands. SPPC would pay BLM annual rental fees for use of the right-of-way on these public lands.

On private property, SPPC's necessity to obtain rights-of-way for this project would be granted by the State of Nevada Public Utilities Commission (PUC). Land ownership would not change, and private property owners would receive compensation for use of the right-of-way based on the market value of the land in the right-of-way and, potentially, on the loss of surrounding property value. SPPC would hire an independent real estate appraiser to estimate the market value of the property within the right-of-way and loss of surrounding property value, if any. After the appraisal, SPPC would present a written offer to the property owner and negotiate to reach a mutually agreeable and fair settlement.

If a mutual agreement cannot be achieved, SPPC and/or the property owner could seek resolution through the legal system. SPPC would have the right provided to public utilities under Nevada Revised

Statute (NRS) 37.010 to seek condemnation of private property in the right-of-way. Financial compensation and property tax issues are discussed further in Section 3.15, Social and Economic Values.

Table 2-2 provides a summary of project components. These components, as well as construction, operation, and maintenance practices, are explained in more detail on the following pages. Table 2-3 provides a summary of the mitigation measures that SPPC has developed and committed to in order to minimize environmental effects associated with the project.

TRANSMISSION LINES AND TOWERS

SPPC proposes using mainly tubular steel H-frame tangent towers to support the proposed transmission lines (see Figure 2-2). The tower structures would consist of two steel poles embedded in the ground and connected by a horizontal cross beams (creating the "H" shape) and diagonal cross braces. The horizontal cross beam supports the insulators and conductors. The towers would vary in height from 75 to 130 feet, depending on terrain. On flat terrain, a typical span between towers would be approximately 1,200 feet. In mountainous terrain, spans could range from 200 to over 2,000 feet. The H-frame tangent towers are used in areas where the transmission line follows a straight alignment.

TABLE 2-2: SUMMARY OF PROJECT COMPONENTS

RIGHT-OF-WAY	
North termination point	Falcon substation, approximately 8 miles north of Dunphy, NV
South termination point	Gonder substation, approximately 8 miles north of Ely, NV
Right-of-way length*	165 to 185 miles long (depending on selected route)
Right-of-way width	160 feet wide
Right-of-way acreage*	3,200 - 3,590 acres (depending on selected route)
Centerline travel route*	A 12-foot wide, two-track, dirt travel route next to the centerline would be used for annual inspections and for maintenance.
TRANSMISSION LINE FACILITIES	
Voltage	345 kV AC (alternating current)
Conductors	Double-bundled 954 kcmil aluminum conductor steel reinforced; approximate diameter per conductor is 1.2 inches.
Minimum conductor distance from ground	26 feet at the maximum operating temperature.
Tower structures	Two-pole tubular steel H-frame tangent towers and three-pole guyed angle/ transposition towers. Natural-weathered steel or rust-color finish.
Area required for towers	Two 3-foot diameter poles 22 feet apart for a tangent tower, and three 3-foot diameter poles 30 feet apart for angle and transposition towers. Angle and transposition towers also have 10 to 12 buried anchors spaced 50 to 100 feet from the towers.
Average distance between towers	1,200 feet
Total number of towers	725 to 820 (approximately 680 to 795 H-frame towers and 25 to 45 angle / transposition towers), depending on route alternative.
SUBSTATION EQUIPMENT ADDITIONS	
Falcon substation*	Proposed expansion: approximately 3.2 additional acres. Proposed equipment: transmission line switching equipment consisting of three 345 kV circuit breakers and two 345 kV reactors to control line voltage.
Gonder substation*	Proposed expansion: approximately 6.2 additional acres. Proposed equipment: two 230 kV power circuit breakers, two 345/230 kV, 300 MVA transformers, two 345 kV power circuit breakers, two 345 kV reactors to control line voltage, and a new control building.

**Approximately 80% of the right-of-way and centerline travel route would be on federal public land managed by the BLM, while the remaining 20% would be on privately-owned lands. The Falcon substation and surrounding 40 acres are owned by SPPC. The Gonder substation is on federal public land developed by way of an existing right-of-way grant issued to Mt. Wheeler Power, which would be amended separately to authorize the equipment upgrades. However, the existing Mt. Wheeler right-of-way property boundary would not need to change, as it is sufficient to accommodate the Gonder substation expansion.*

Where the transmission line changes direction, three-pole guyed angle towers would be used instead of H-frame towers. Also, to reduce electrical loss over this long line, three transposition towers would be required to rotate phases every 40 to 50 miles. Transposition towers are angle towers with cross phasing connections that are created by changing the orientation of the conductors. Approximately 25 to 45 three-pole angle towers and 680 to 795 H-frame towers would be needed. The exact number of towers would depend on the route alternative selected and terrain conditions.

The steel poles would be bare metal that would naturally weather to form a protective rust-colored coating. This finish was chosen to blend with the colors of existing wood and steel lines and areas with dark vegetation, such as pinyon pine and juniper woodlands.

Each tower would support three double bundles (a total of six) non-specular (non-reflecting), stranded aluminum, steel reinforced conductors. Each conductor would be 954 kcmil (cable cross section area in thousand circular mils) with an approximate diameter of 1.2 inches. Minimum conductor ground clearance would be 26 feet at the maximum operating temperature. Two shield wires would be installed at the top of the towers. These are stranded steel wires 3/8 inches in diameter that protect the conductors from lightning strikes. Every structure would be electrically grounded with copper wire and buried ground rods. The line would meet or exceed the requirements of the latest version of the National Electric Safety Code.

Table 2-3 identifies mitigation measures that SPPC has committed to as part of the proposed project in order to reduce environmental impacts. Other mitigation measures described in subsequent chapters were identified during the environmental review process and would be recommended or required in addition to the following measures.

SUBSTATION FACILITIES

Prior to connecting and energizing the transmission line, the Falcon and Gonder substation fence boundaries would be expanded and new equipment installed. The new equipment at the Falcon substation would include line switching equipment and two reactors to control voltage. The new equipment at the Gonder substation would include two 345/230 kV 300 MVA transformers, line switching equipment, and two reactors to control voltage.

CONSTRUCTION METHODS

Access Roads

Project construction would require the use of a number of existing access roads to transport materials and equipment to and from the transmission line corridor, substations, and material yards. In some areas, existing dirt roads would require widening or other improvements to accommodate the construction equipment. SPPC would coordinate with responsible agencies and property owners to acquire the appropriate approvals (e.g., temporary use permits) to use and, in some cases, to improve these access roads.

TABLE 2-3: APPLICANT-COMMITTED MITIGATION MEASURES

SPPC-COMMITTED MITIGATION MEASURES TO REDUCE ENVIRONMENTAL IMPACTS	
Tower design	The H-frame tower was selected instead of a lattice frame tower-type to minimize impacts to sensitive wildlife because this type of tower provides fewer opportunities for perching and nesting by raptors and corvids. This tower also closely matches the design of existing lower voltage power lines in the area, which should reduce the visual contrast when located near these other existing lines. Also, this type of tower minimizes ground disturbance and land area required, has a better public safety record (i.e., discourages climbing), and has fewer maintenance requirements compared to the lattice tower type.
Tower material/color	Tower components would be made of steel, which would weather naturally to a rust color to blend in with the landscape and existing wood pole lines, thereby minimizing visual impact.
Tower placement	To the extent practical, towers would be strategically located during design to avoid sensitive environmental areas and minimize visual impacts.
Conductors	Aluminum conductors would be blasted to provide a non-specular finish to reduce reflectivity.
Use of existing access roads	To the extent feasible, existing access roads would be used by construction vehicles and equipment to access the transmission line ROW and substations.
Vegetation clearance	Hydro-axing or mowing, instead of grading, would be the primary technique used to clear vegetation where needed to provide access for construction vehicles and equipment. This reduces surface disturbance and preserves much of the stem and root systems, which allows vegetation to grow back.
Tree removal	In forested areas, tree removal would be selective and not include every tree in the ROW. Generally, trees over 15 feet in height within 55 feet of the centerline would be removed to provide the required electrical line clearance.
Use of helicopters	Helicopters would be used to string conductor sock line during construction. This helps reduce disturbance to environmental resources associated with ground-based stringing equipment. In some environmentally sensitive or difficult to access areas, helicopters would also be used to fly in and set the transmission line towers. This helps reduce disturbance associated with bringing some of the long material transport trucks and large equipment into these areas. However, some equipment will still need to be transported to every tower site for excavation and backfill and wire clipping. What is eliminated with helicopter construction is the material transport trucks, up to 130' long, and the 100-ton cranes required to set the structures. Bucket trucks and track hoes will still need to access sites for construction.
Post-construction reclamation	After construction, SPPC would reclaim and revegetate the centerline travel route, spur roads and other construction areas as described in this chapter and in the Reclamation Plan in Appendix E. SPPC would restore existing access roads to a pre-construction condition unless an upgraded road is requested by the property owners or the responsible agency.
Annual line inspections	About once a year, two SPPC line inspectors would ride ATVs along the centerline travel route to inspect the transmission line. Use of ATVs would help reduce vegetation disturbance and limit the long-term centerline travel route disturbance area to approximately a maximum 12-foot wide two-track path.

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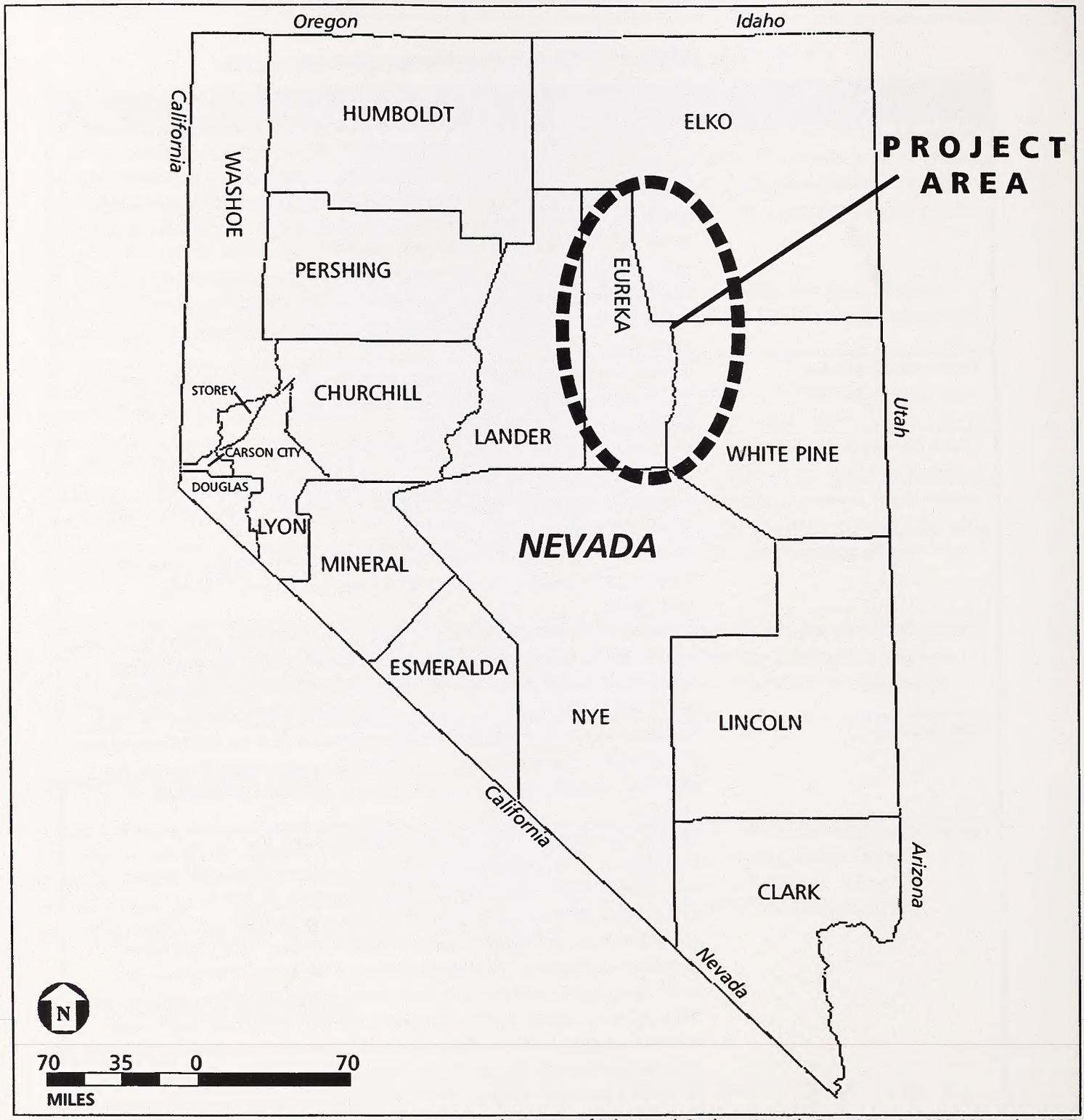

Source: Nevada Bureau of Mines and Geology, Nevada Base Map 1:1,000,000 scale, 1997.

LEGEND

Project Area

Figure 2-1
Project Vicinity Map

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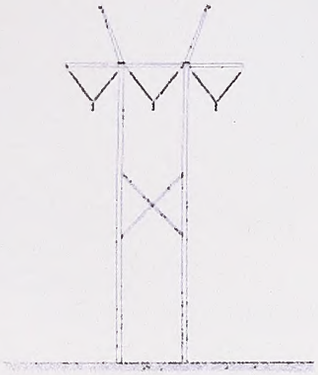
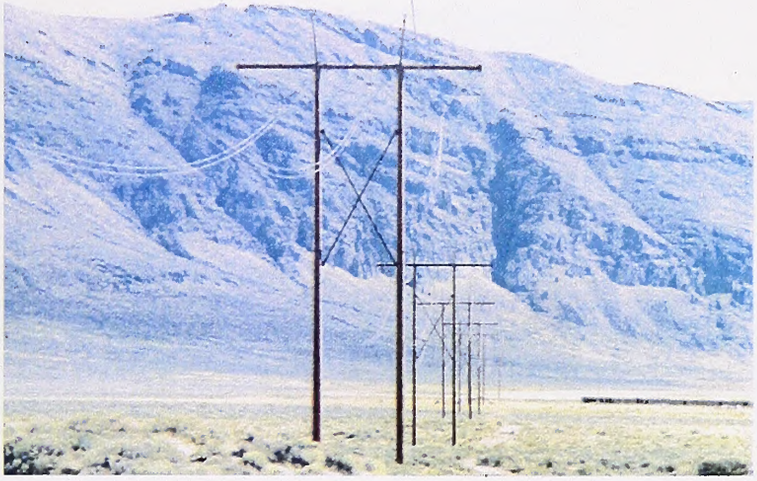
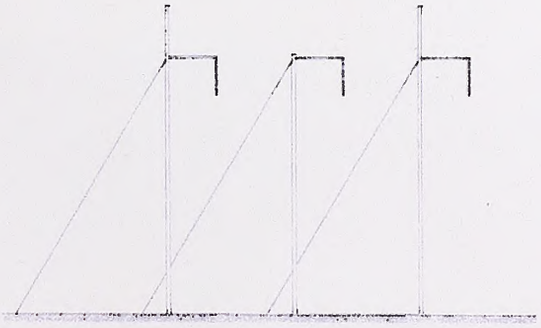


A. H Frame Tower (Diagram)



B. H Frame Tower (Photograph)



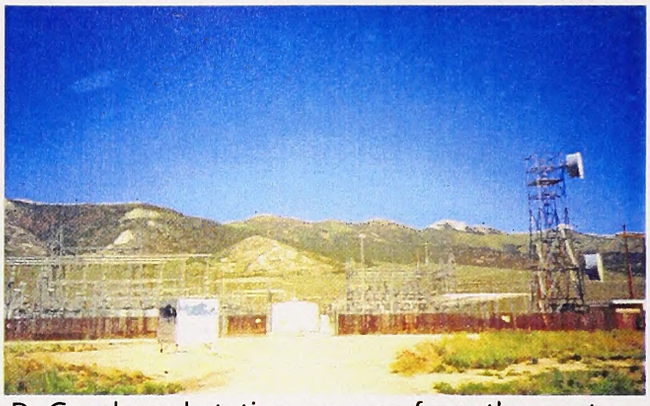
C. Angled Tower (Diagram)

D. Angled Tower (Photograph)

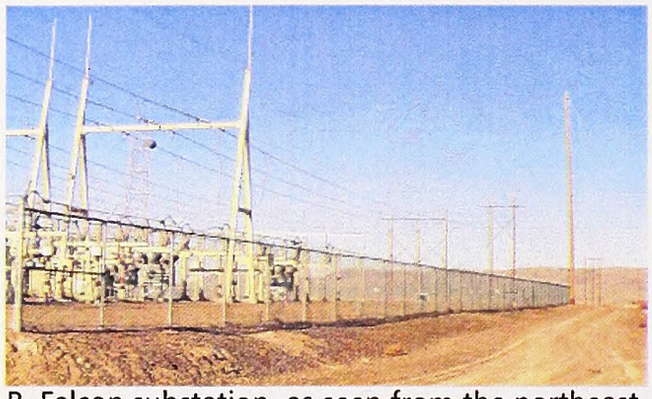
Source: EDAW, Inc., 2000.

Figure 2-2
Tower Structures

A. Falcon substation, as seen from the northwest.



D. Gonder substation, as seen from the west.



B. Falcon substation, as seen from the northeast.

E. Gonder substation, as seen from the east.

C. Falcon substation, as seen from the north.

F. Gonder substation, as seen from the south.

Figure 2-3

Views of Falcon and Gonder Substations

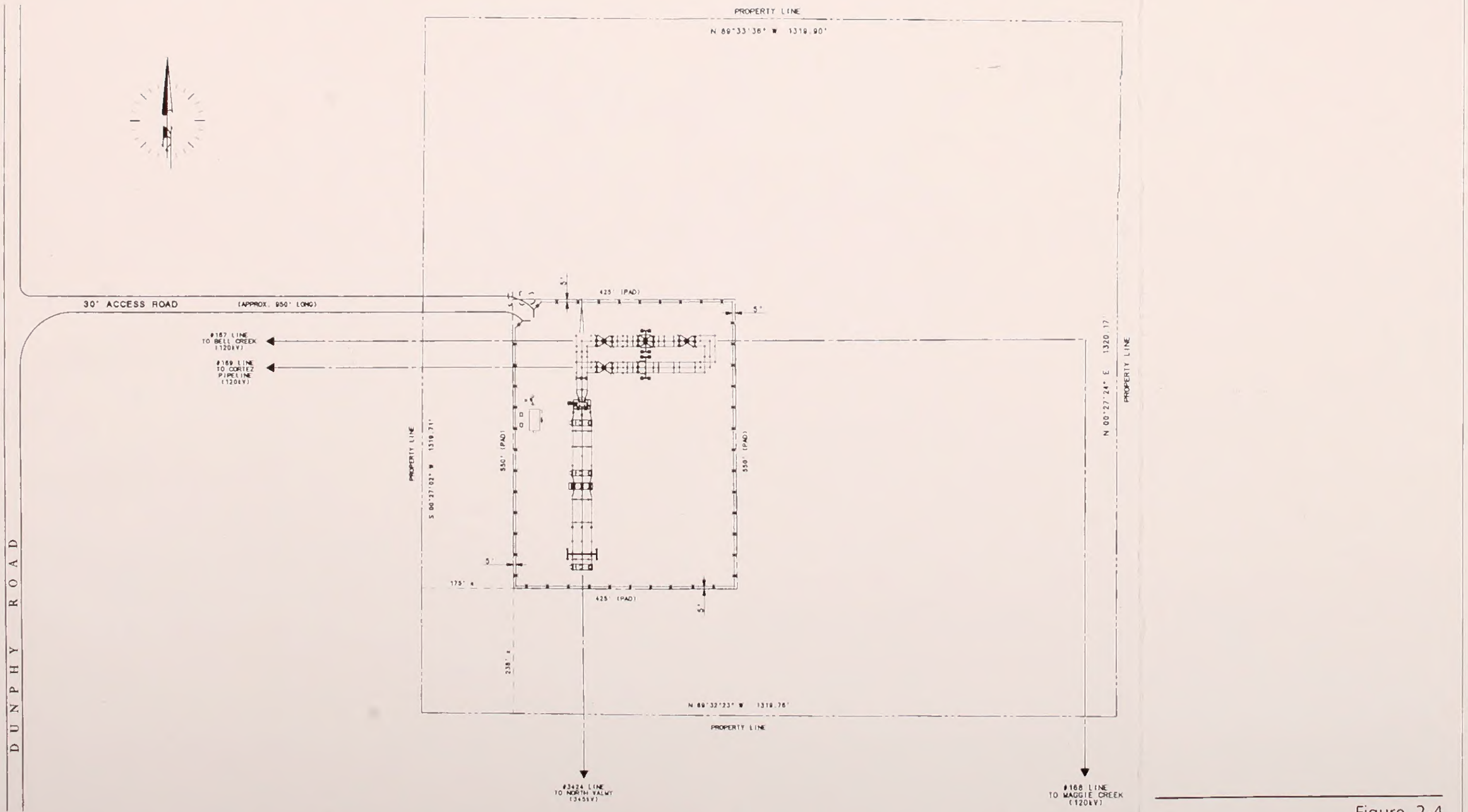


Figure 2-4
Falcon Substation Plot Plan (existing)

Source: Sierra Pacific Power Company, 2000.

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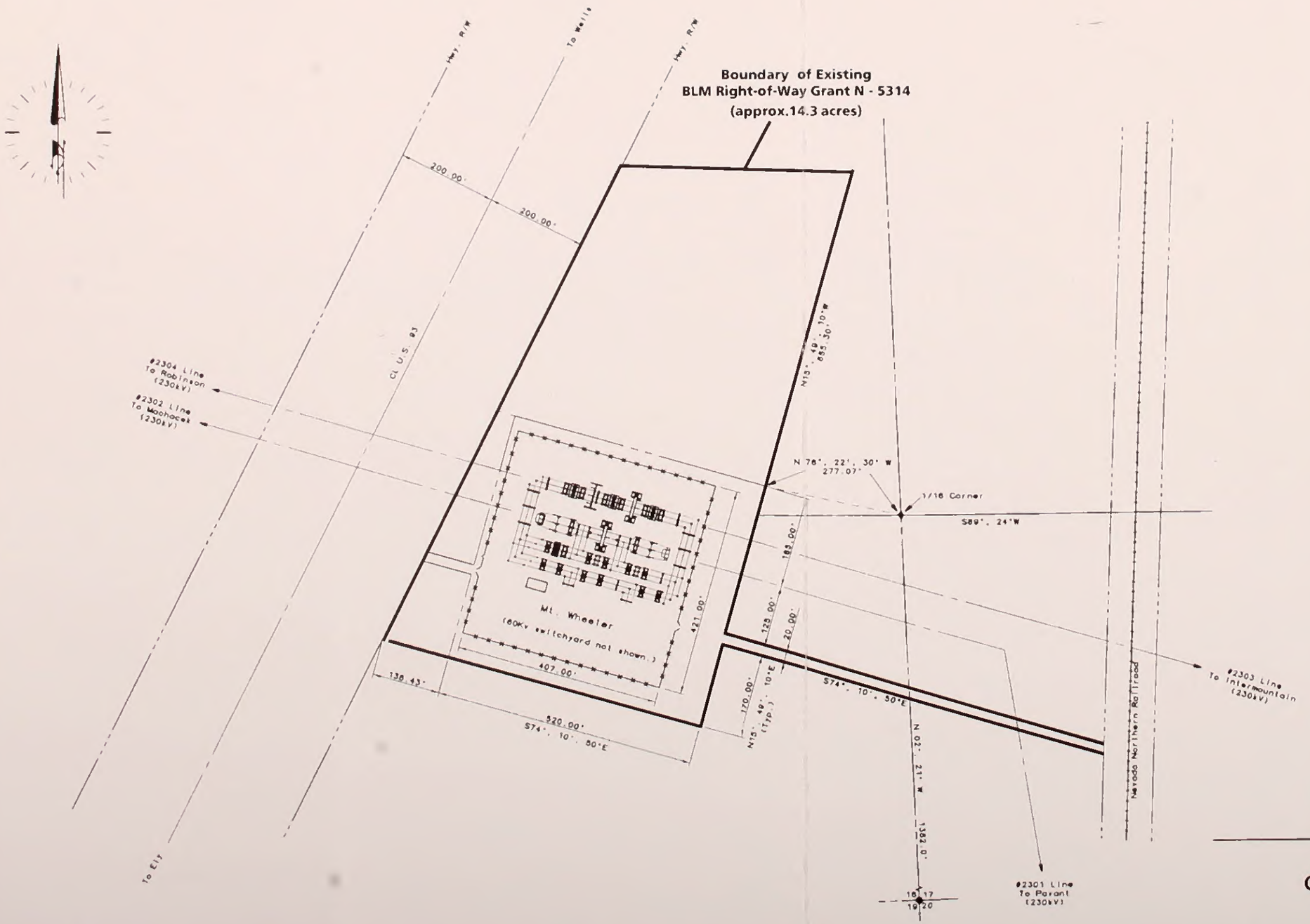
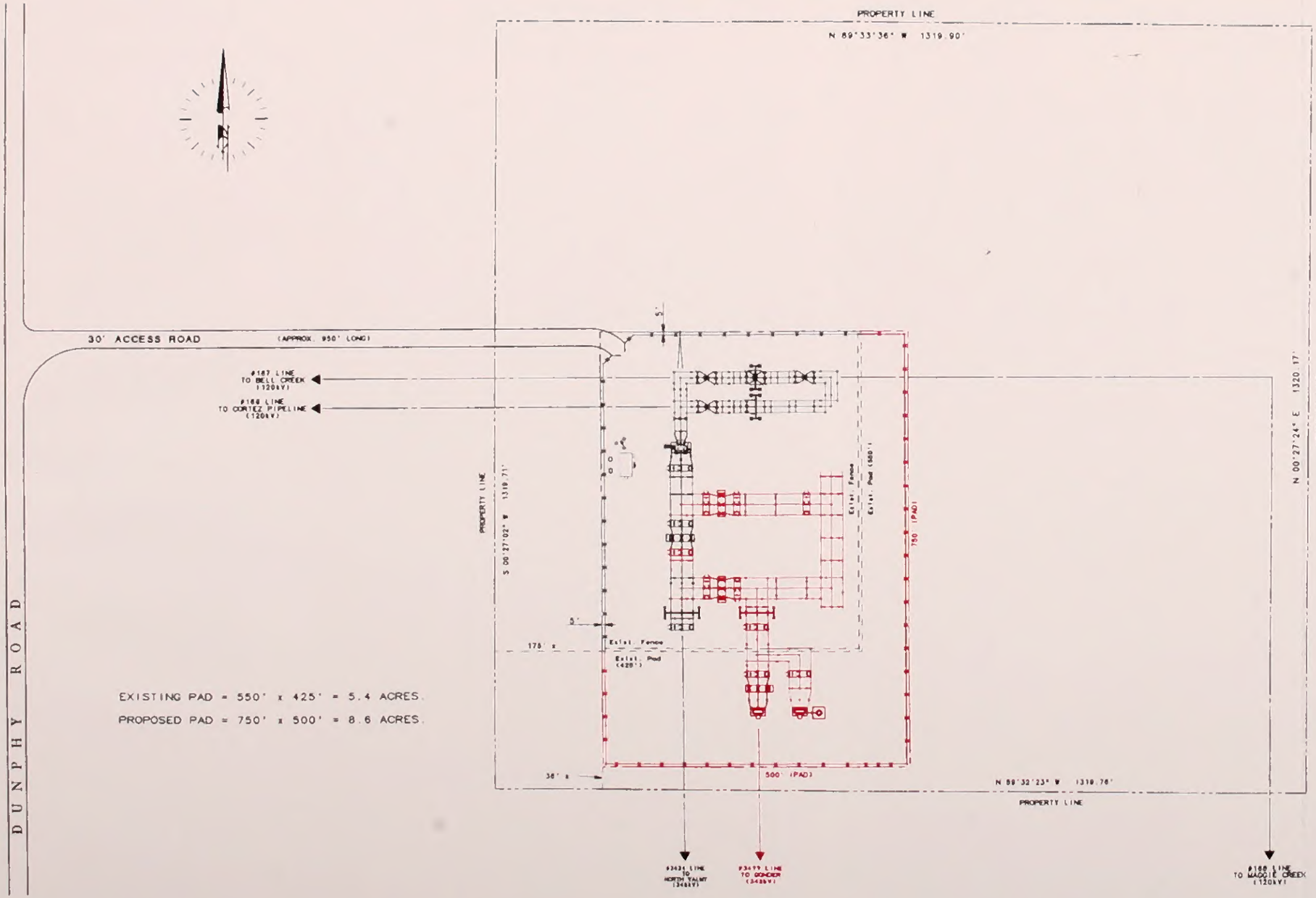


Figure 2-5
Gonder Substation Plot Plan (existing)

Source: Sierra Pacific Power Company, 2000.



EXISTING PAD = 550' x 425' = 5.4 ACRES.

PROPOSED PAD = 750' x 500' = 8.6 ACRES.

Figure 2-6
Falcon Substations Plot Plan (proposed)

Source: Sierra Pacific Power Company, 2000

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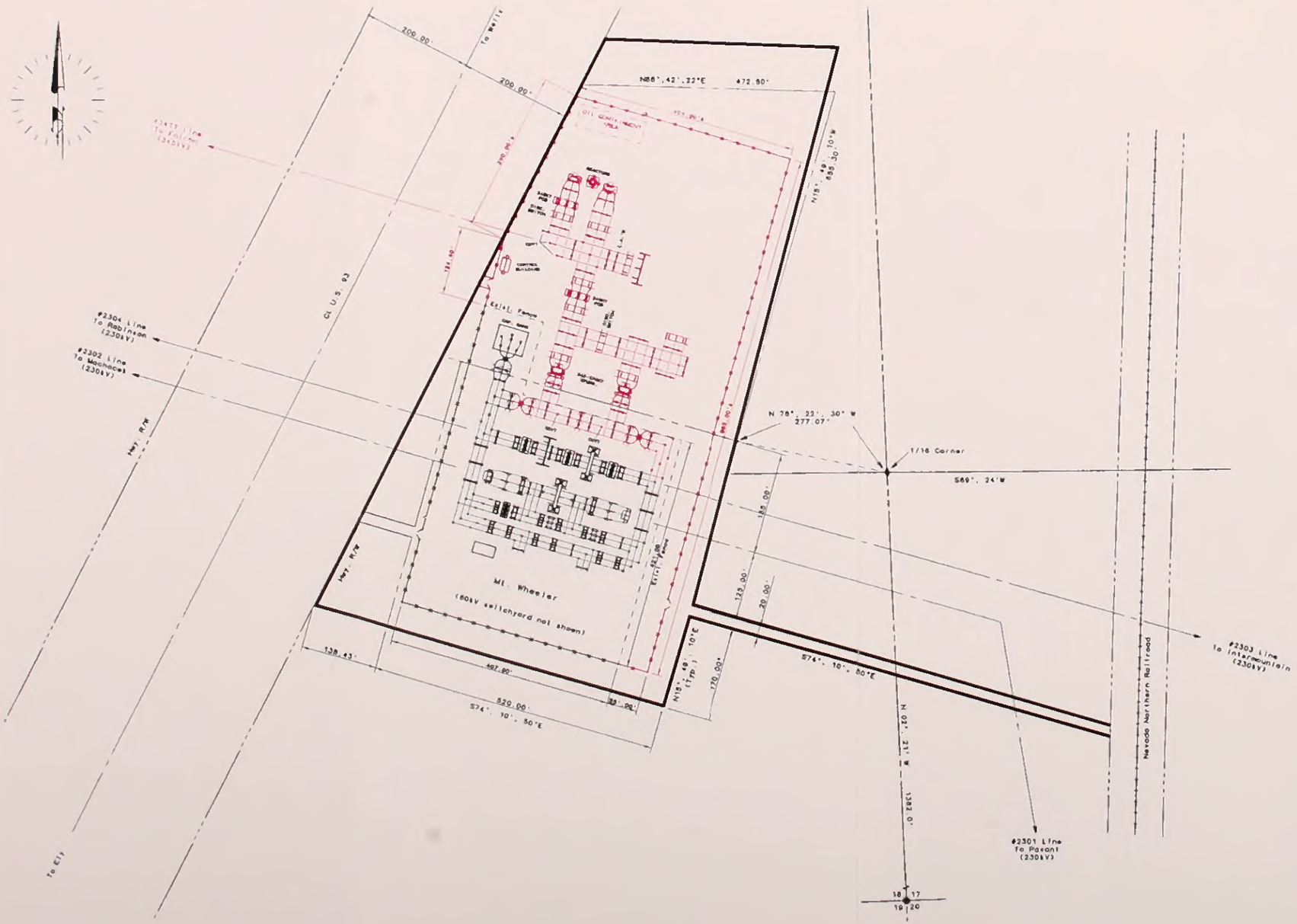

Figure 2-7
Gonder Substation Plot Plan (proposed)

Source: Sierra Pacific Power Company, 2000.

In this document, "access roads" are defined as any existing road that might be used to access the construction sites from the nearest state highway. The point of access would be where such roads join a numbered state highway. There are three types of existing access roads that would be used to construct the project:

1. **Paved roads:** Paved roads see frequent use by local communities and, with a hard surface, should be accessible under any conditions by construction equipment.

2. **Dirt roads that would not require improvements:** These are typically well-maintained county roads that see frequent use and should be accessible under most weather conditions. Under adverse weather conditions, some of these roads could require maintenance, typically grading, to keep the road in an acceptable condition for both construction and non-construction users, or after construction to restore the road to a pre-construction condition.

3. **Dirt roads that may require improvements:** The types of improvements that may be required on some dirt roads (e.g., narrow, two-track roads) to provide construction vehicle and equipment access may include one or more of the following:

   - ***Curve widening*** - To accommodate the turning radius of 130-foot long trucks.
   - ***Road widening*** – To accommodate trucks and equipment, access roads requiring improvements would be widened to 12 to 15 feet wide in most areas. In some places, the roads would need to be widened to 30 feet to allow for truck passing areas, turnouts, curve widening, and room for cut-and-fill slopes in steep terrain. Except in forested areas or steep terrain, the preferred method of vegetation removal would most likely be mowing. A lawnmower-type machine would be used to cut brush and other vegetation down to about 3 to 6 inches above grade, leaving the stems and root systems intact to allow for regrowth of vegetation. Therefore, surface disturbance would be mainly from pneumatic tire pressure. Subsurface disturbance usually does not occur with this process. In areas with rough terrain and steep slopes, grading of topsoil may be required to widen access roads and for cut-and-fill activities. Blading, which involves use of a bulldozer to move large rocks and soil, usually would be used only in steep terrain as needed, as it involves increased time, costs, and reclamation efforts.
   - ***Cut-and-fill on side slopes*** - To provide a safe minimum width for equipment access on steep slopes, a balanced cut-and-fill procedure would be used. This would avoid the need to import or export material and simplify post-construction recontouring.
   - ***Surface improvements*** - Some of the existing access roads are in poor shape and will not allow access by construction equipment without surface improvements. Generally, the problem areas have rocky, loose, or saturated surface soils. In rocky areas, the road surfaces would need to be graded and the rocks pushed to the side of the road. In loose soil, the surface is unable to support heavy construction equipment, and these areas would require grading, moisture conditioning, and compaction. In saturated soil areas, grading, compaction, and bridging with imported material (< 6-inch rock) may be required to promote drainage and provide a solid surface.
   - ***Natural drainage crossings*** - Depending on the time of year and weather conditions, various methods would be used to cross the drainages. Smaller drainages would be rock armored and graded to provide vehicle access. Larger drainages may require culverts or bridges.
   - ***Tree removal and trimming*** - In forested areas, trees that have fallen onto or encroach into the minimum road width of approximately 12 to 15 feet would need to be trimmed or removed to allow access. This effort also would support curve and road widening improvements.

Table 2-4 estimates the types and lengths of existing access roads that would be used during construction. Estimates of the extent of temporary disturbance associated with the access road improvements are based on two assumptions: (1) the access roads would require improvements along their entire length, and (2) they would be widened to 30 feet. This reflects a worst-case estimate for purposes of this EIS. However, in most areas, the access roads would be widened to only 12 to 15 feet. Thus, the actual area of disturbance is expected to be far less. More detailed analysis of the access road improvements would be completed as part of the Construction, Operation, and Maintenance (COM) Plan.

Spur Roads

In areas where an existing access road closely parallels the transmission line route, SPPC could use it to avoid clearing a new centerline travel route (see Figure 2-8). However, new 30-foot wide "spur roads" would be needed temporarily to transport construction equipment from the existing access road to the tower locations. The length of new spur roads needed is estimated in Tables 2-5 and 2-6. Spur roads would be contained largely within the 500-foot transmission line study corridor and would be reclaimed by SPPC after construction.

TABLE 2-4: EXISTING ACCESS ROADS TO BE USED DURING CONSTRUCTION

EXISTING ACCESS ROADS BY SEGMENT					
Segment	Road Type (miles)			Total miles of access roads	Maximum Area of Temporary Disturbance from Access Road Improvements* (acres)
	Paved Roads	Dirt Roads (no improvements)	Dirt Roads (that may require improvements)		
A	2.34	5.59	31.93	39.86	116.1
B**	4.25	66.62	67.01	137.88	243.7
C		32.57	30.89	63.45	112.3
D		11.28		11.28	0
E	35.68	167.82	87.95	291.45	319.8
F		3.43	17.02	20.46	61.9
G		31.12	18.79	49.91	68.3
H	3.00	7.85	21.08	31.93	76.6
I	2.30	25.37	52.19	79.86	189.8
J	17.92	6.63	93.51	118.06	340.0
Route Alternatives					
Crescent Valley					
(a)	26.82	138.76	280.45	446.03	1019.8
(b)	29.81	115.49	282.74	428.05	1028.1
Pine Valley					
(a)	22.56	115.98	244.33	382.88	888.5
(b)	25.56	92.72	246.62	364.89	896.8
Buck Mountain					
	55.95	212.60	244.28	512.82	888.3

* *Estimated area of temporary disturbance is based on a worst-case assumption that dirt access roads that may require improvements would be widened to 30 ft. However, in most areas, widening to 12 to 15 feet would be sufficient to provide access for construction trucks and equipment. Thus, actual disturbance is expected to be far less.*

** *Assumes Segment B would follow the L re-route.*

Segments and route alternatives are described in Section 2.2

Source: EDAW GIS analysis of SPPC access road data (2000).

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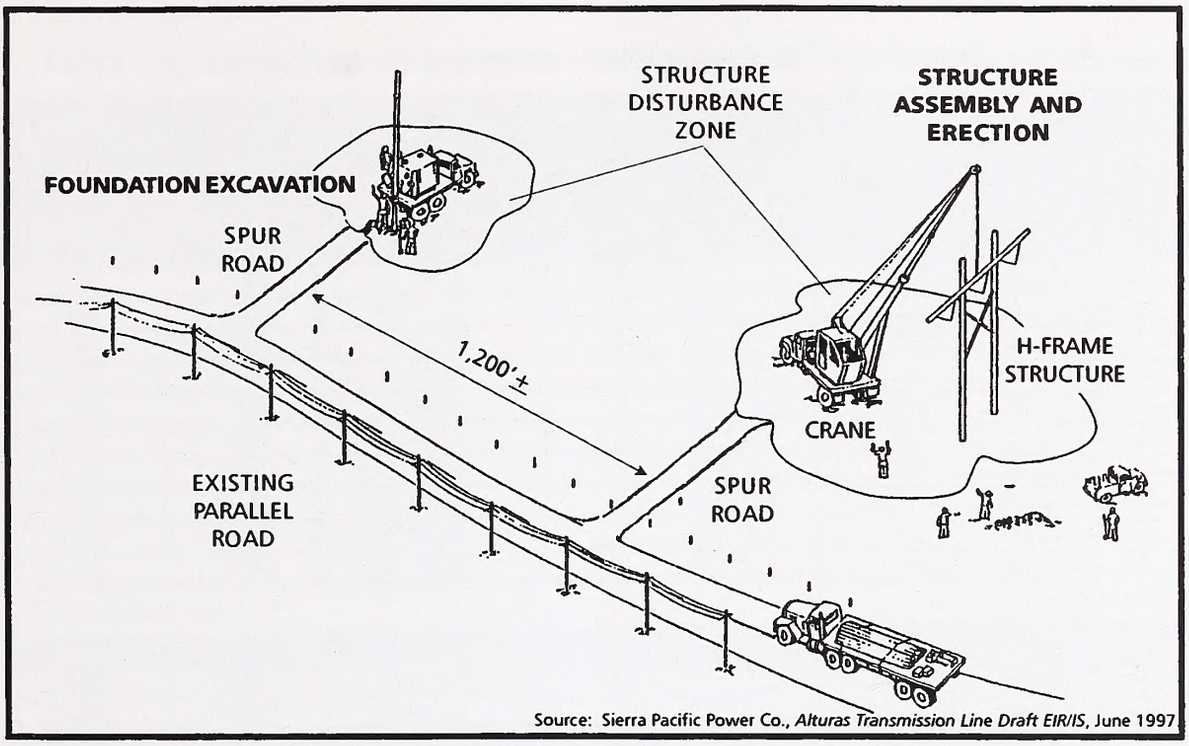
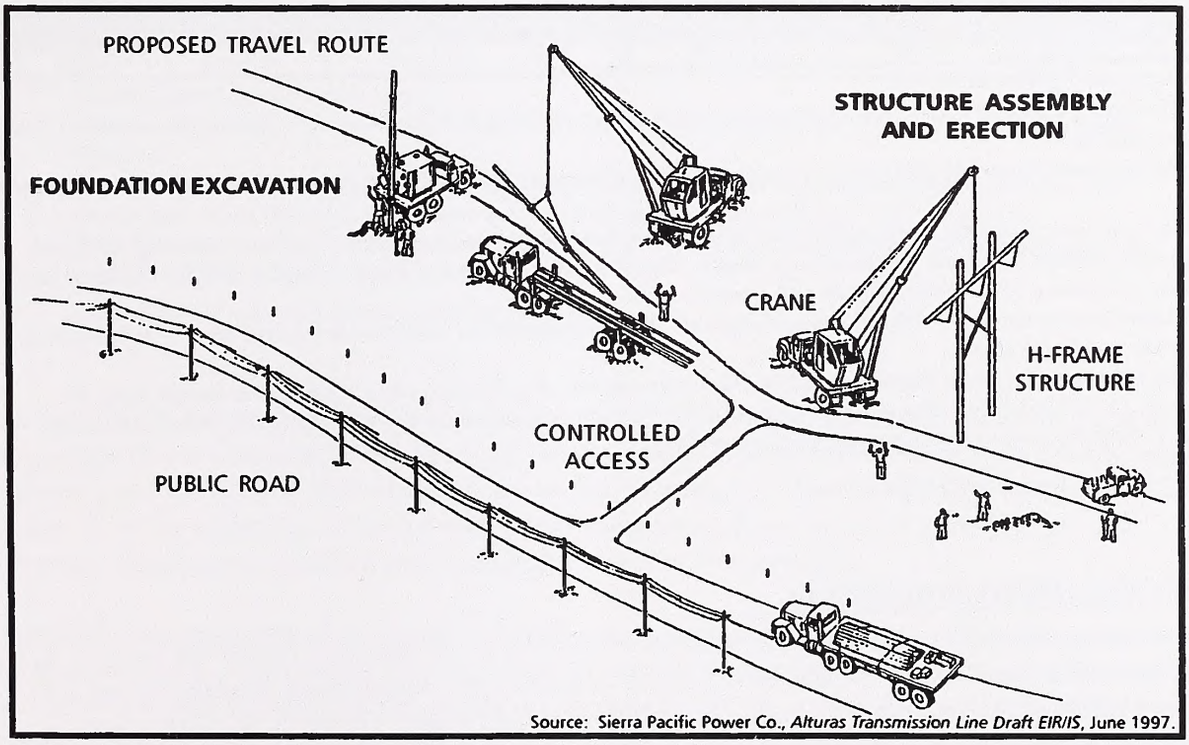


A. Structure Erection - Type I: Use of Existing Parallel Access Road and Spur Road



B. Structure Erection - Type II: Use Centerline Travel Route

Figure 2-8
Construction Methods Diagram

TABLE 2-5: TEMPORARY DISTURBANCE AREA ESTIMATE

Segment	Total (miles)	Existing Access Roads [1] (miles)	Temporary Centerline Travel Route [2] (miles)	Temporary New Spur Road [3] (est. miles)	Towers [4]		Estimated Total Temporary Disturbance [5] (acres)
					Angle (3-pole) (est. #)	H-frame (2-pole) (est. #)	
A	16.71	31.93	1.78	4.36	9	65	197.1
B*	62.11	67.01	30.30	6.63	19	254	584.5
C	35.73	30.89	35.73		4	153	355.5
D	19.52		19.52		2	84	132.7
E	74.76	87.95	74.76		7	322	827.5
F	16.81	17.02	16.81		4	70	178.0
G	19.90	18.79	19.90		2	86	203.6
H	20.36	21.08	20.36		3	87	215.8
I	30.32	52.19	23.32	2.92	3	130	381.0
J	40.08	93.51	40.08		6	170	614.0
Route Alternatives							
Crescent Valley							
(a)	185.93	280.45	132.18	13.90	43	775	2268.5
(b)	186.39	282.74	132.64	13.90	44	776	2280.7
Pine Valley							
(a)	179.06	244.33	157.12	7.27	30	758	2172.2
(b)	179.52	246.62	157.58	7.27	31	759	2184.4
Buck Mountain							
	167.28	244.28	152.34	4.36	26	710	2104.5

* *Assumes Segment B follows the I-re-route*

1 *Estimates length of existing dirt access roads that may require improvements (including parallel access roads). Assumes maximum 30 ft width as worst case-scenario.*

2 *Estimates maximum 30-foot wide temporary centerline travel route for construction along entire route except where parallel access roads would be used.*

3 *Temporary spur roads (maximum 30-foot width) would be constructed from parallel access roads to tower locations at an average 1200-foot intervals along centerline travel route. (Estimated spur lengths: Seg A = 350 ft / Seg B = 250 ft / Seg I = 500 ft.) Maximum temporary disturbance calculated as 30 ft corridor width for each spur road.*

4 *Towers estimated at an average of 1200-foot intervals along route. Estimated construction disturbance for H-frame towers = 0.7 acre/ tower; Angle towers = 1.5 acre/ tower.*

5 *Estimated maximum total area of temporary construction disturbance includes all of the above, plus 5 material yards (average size of 20 acres/yard), plus 3.7-acre Falcon substation expansion and 6.7-acre Gonder substation expansion. (Substation area includes 0.5 acres for temporary stockpiling of top soil and organic materials at each site.)*

Source: EDAW GIS using Stantec (2000) database

Right-of-Way (ROW) Preparation

In areas where an existing parallel access road is not available (i.e., all segments except for parts of A, B, and I), a "centerline travel route" would be needed to construct the transmission line (see Figure 2-8). The average width of the centerline travel route would be 12 to 15 feet. However, in some places, it would need to be widened to 30 feet to allow for construction vehicle passing areas. In most instances, the centerline travel route would be alongside the transmission line. However, in some locations, hillsides, rough terrain, and avoidance of sensitive environmental resources may require that the travel route extend outside of the 160-foot right-of-way. This would be authorized by BLM through a temporary use permit or through ingress and egress provisions in the right-of-way grant.

TABLE 2-6: LONG-TERM DISTURBANCE AREA ESTIMATE (OVER LIFE OF THE PROJECT)

Segment	Total Length (miles)	Centerline Travel Route [1] (miles)	Towers [2]		Estimated Total Long-Term Disturbance [3] (acres)
			Angle (3-pole) (est. #)	H-frame (2-pole) (est. #)	
A	16.71	16.71	9	65	24.3
B*	62.11	62.11	19	254	90.4
C	35.73	35.73	4	153	52.0
D	19.52	19.52	2	84	28.4
C	74.76	74.76	4	322	108.9
F	16.81	16.81	4	70	24.5
G	19.90	19.90	2	86	29.0
H	20.36	20.36	3	87	29.6
I	30.32	30.32	3	130	44.1
J	40.08	40.08	6	170	58.4
Route Alternatives					
Crescent Valley					
(a)	185.93	185.93	43	775	280.1
(b)	186.39	186.39	44	776	280.8
Pine Valley					
(a)	179.06	179.06	30	758	270.1
(b)	179.52	179.52	30	759	270.8
Buck Mountain					
	167.28	167.28	26	710	253.0

* *Assumes Segment B follows the L re-route.*

1 *Assumes a 12-foot wide two-track dirt travel route along centerline of entire alignment for the purpose on conducting routine inspections.*

2 *Towers estimated at 1200 foot intervals (on average) along the route. Estimated long-term disturbance calculated for 3-foot diameter poles. Total disturbance per H-frame tower = 14.12 square feet; per Angle tower = 21.21square feet.*

3 *Estimated maximum total long-term disturbance includes all of the above, plus 3.2 acres for the Falcon substation expansion and 6.2 acres for the Gonder substation expansion.*

Source: EDAW GIS using Stantec (2000) database

Where necessary, vegetation within the centerline travel route would be cleared primarily by hydro-axing (using a type of mowing machine). In rough terrain, side slopes would be cut and filled using grading equipment, and rocks and other obstructions would be bladed to allow for passage of rubber-tired vehicles. If rocks cannot be removed with heavy equipment, they may need to be blasted with explosives. Explosives would be used mainly for tower hole excavation.

In forested areas, trees would be removed within the centerline travel route to allow construction vehicles access and as needed for electrical clearance under and around the transmission lines and towers. Tree removal would be selective and would not include every tree in the 160-foot wide right-of-way. Generally, all trees over 15 feet in height within 55 feet of the centerline would be removed to provide the required line clearance. Tree trimming would be conducted to allow for a ten-year growth envelope.

Tables 2-5 and 2-6 provide estimates of the amount of temporary and long-term disturbance, respectively, that would be associated with the project. The temporary disturbance estimates reflect a worst-case assumption that a 30-foot wide centerline travel route would need to be cleared for construction purposes (although as explained above, the average width would be 12 to 15 feet in most places). After construction, SPPC would reclaim and revegetate the spur roads and centerline travel route, as described in Appendix E, Reclamation Plan.

However, about once a year, two SPPC inspectors on small all-terrain vehicles (ATVs) would use a part of the centerline travel route to inspect the transmission line. Over time, this ATV activity is expected to create a 12-foot wide two-track path next to the transmission line. Table 2-6 estimates the amount of acreage that would be disturbed over the life of the project from this 12-foot wide travel route and other features. Access to this travel route by larger vehicles would not normally be required, unless problems are encountered. Maintenance and emergency access procedures would be defined in the COM Plan.

500-foot Wide Study Corridor

Since some construction activities cannot be contained within the 160-foot wide right-of-way, BLM and SPPC delineated a 500-foot wide study corridor to ensure that potentially impacted wildlife, vegetation, cultural resources, and other features would be identified during field surveys and considered in this EIS analysis. The 500-foot study corridor is also intended to provide the flexibility needed to allow contractors room to maneuver around sensitive resources while constructing the transmission line. The majority of construction activities would occur within the 500-foot study corridor and on existing access roads. These construction activities are part of the Proposed Action and their impacts are analyzed in Chapter 3.

In a few extremely rugged locations, the terrain may force travel outside the 500-foot wide study corridor to get around impassable features. If this situation occurs, proper approvals would be acquired to work outside the 500-foot wide study corridor. Detailed information on these areas and approval protocols would be provided in the COM Plan.

Tower Foundation Excavation

The tubular steel H-framed tangent towers require two excavations approximately 4 to 6 feet in diameter and 10 to 15 feet deep. The excavations would be placed 22 feet apart. The three-pole angle and transposition towers require three excavations, roughly the same size, but 30 feet apart. Angle and transposition towers also have 10 to 12 buried anchors that require 12- to 15-foot deep excavations spaced 50 to 100 feet out from the towers. Excavation hole diameters would be larger in loose or rocky soils. Excavations would be augered wherever possible. Drilling, blasting, and excavation with backhoes is an alternative excavation method in rocky soils that cannot be efficiently augured.

In steep terrain (over a 5% slope), grading would be required to create level pads for excavation equipment and tower installation. The amount of grading would depend on the degree of slope and type and height of tower. To provide correct excavation depths at each tower site, a level pad may remain around some structures located on cross slopes.

Tower Assembly and Erection

The disturbance area required around each tower site for the equipment pads, excavations, tower assembly, and erection activities should not exceed 0.7 acre for each H-frame tower and 1.5 acres for each three-pole angle tower and transposition tower. Most of this disturbance for tower construction would be kept within the 500-foot wide study corridor. Construction activities outside of the 160-foot wide ROW would be authorized by BLM through a temporary use permit or other approval.

Tower components would be delivered from material yards and assembled into a complete structure for erection at each tower site. Erection crews would follow the assembly crews and set the completed H-frame tower in the excavated holes using a large mobile crane. Depending on soil conditions, compacted native soil, imported backfill, or concrete would be used to fill the space between the tower poles and sides of the excavations.

In places where the soil is poor or where helicopters are used for tower installation, concrete backfill may be required. In these cases, H-frame structures would require two temporary above-ground anchors for approximately 24 hours to keep the structure aligned and plumb while the concrete sets. Although the

contractor would determine the exact method, the temporary anchorage method could involve attaching four wires between the top of the structures to two concrete blocks set on the ground on either side of the structure. To provide the proper angle on the temporary guy wires, the concrete blocks would be set about 300 feet either side of the structure, which falls outside the 0.7 acre disturbance area. The only ground disturbance associated with the concrete blocks would be the travel out and back to set and remove the blocks. After the concrete backfill hardens, the concrete blocks and wires would be removed.

Each three-pole angle and transposition tower would require ten to twelve permanent buried anchors. Every tower would be electrically grounded by connecting the tower to ground wires and buried ground rods. In good soil, one 8-foot ground rod next to the tower is sufficient; in poor soil, additional ground rods and wire may need to be buried.

Helicopter Installation in Rough Terrain

Helicopters would likely be used to install towers in areas with rough terrain, such as in parts of Segments B, C, E, F, I, and J. In these areas, temporary helicopter fly yards would be located about every 8 miles in the right-of-way, or on an access road or spur road. These yards would also be restored or revegetated as described in Appendix E, Reclamation Plan.

Conductor and Shield Wire Installation

The installation of conductors and shield wires is a three-step process (see Figure 2-9):

1. Install sock line (wire pull ropes) by helicopter.
2. Pull conductors and shield wires with ground-based equipment.
3. Correctly sag and tension the conductors and shield wires and connect them to the towers.

This three-step process would be performed from wire setup sites spaced approximately every 4 miles to connect approximately 15 to 20 structures at a time. The number of wire setup sites would depend on terrain and equipment capacities. Most of these sites would be located within the 160-foot ROW and be approximately 500 feet in length. Wire setup sites located at line angle points would fall outside the 160-foot ROW, and may fall outside the 500-foot wide study corridor due to personnel and equipment safety requirements. These sites would be identified and evaluated in the COM Plan. Construction activities outside of the 160-foot wide ROW would be authorized by BLM through a temporary use permit or other approval.

Installation of the sock line (wire pull ropes) would be done by helicopter. The sock line is the first small pulling wire spooled out from a large motorized drum at a wire setup site and threaded through travelers or pulleys on each tower to another wire setup site called the pulling site. This small wire is then attached to a larger wire that is pulled back through the travelers by stationary ground-based equipment to the conductor and shield wire reels located at the first wire setup site. Then the conductors and shieldwires are pulled by the larger wire through each tower to the pulling site. When the conductors and shield wires reach the pulling site, they are correctly sagged and tensioned, then permanently clipped into the clamps at each tower.

Helicopter fly yards (i.e., places where the helicopters land to pick up sock line or other materials) would be needed about every 10 miles along the construction corridor. The locations of these fly yards and any associated impacts and mitigation measures would be identified in the COM Plan.

Material Yards

It is anticipated that four or five material yards would be needed to construct the project, ranging in size from 10 to 40 acres with an average size of 20 acres. Potential material yard sites are shown in Figure 2-

10. If the construction contractor requests additional material yards to improve efficiency, proper approvals would be acquired.

Material yards would serve as storage and handling sites, and maintenance yards. These yards would contain construction material, equipment, tools, fuel, service trucks, spare parts, vehicles owned by the construction labor, and possibly portable office space. Most equipment would be serviced at these locations, but damaged equipment may need to be repaired at the breakdown location.

Most of the potential material yard locations shown in Figure 2-10 are sites that are or have been used for agricultural or mining activities:

- **Yard #1**, near Dunphy, would be on an industrial site with a rail siding.
- **Yard #2** would be on mine property on one or both sides of Highway 306.
- **Yard #3** would be located on agricultural property along the northern part of Highway 278.
- **Yard #4** would be on agricultural land in Diamond Valley near the southern end of Highway 278.
- **Yard #5** is the only one on BLM land, but the yard would be located within a mining complex on previously disturbed ground.
- **Yard #6**, which is near the Gonder substation and has rail service, contains mostly rabbitbrush and sagebrush. The contractor would clear and reseed the site after construction.

The material yards would be restored to the condition they were in prior to the start of construction or as otherwise agreed upon by SPPC and the property owner. SPPC would not leave the sites in a condition that would cause nuisance dust or weed infestation. If unspecified by the owner, reclamation would be in accordance with the COM Plan.

Right-of-Way Cleanup

Crews would follow the conductor and shield wire installation to clean up all surplus material, equipment, construction debris, etc. Tree trimmings and removed vegetation would be shredded and spread within the ROW as mulch or disposed of off-site. Rocks excavated during the construction of access roads and foundation excavations would be used to recontour and reclaim disturbed areas, distributed within the ROW, and incorporated as backfill on roads and around the towers as needed.

Post-Construction Reclamation

Access Roads

After construction, SPPC would restore existing dirt roads that required improvements to a condition as good or better than they were in before construction. Erosion control would be performed on steep slopes. Depending on the landowner and agency preference, culverts and bridges could be left in place.

If needed, SPPC could mitigate adverse impacts by recontouring back to the original slope, decompacting surface soils, reseeding with approved seed mixed at pre-determined application rates, and other techniques. The precise level of reclamation needed would be determined by the BLM based on environmental impacts identified in this EIS, pre-construction survey findings, and landowner preference and included in the COM Plan.

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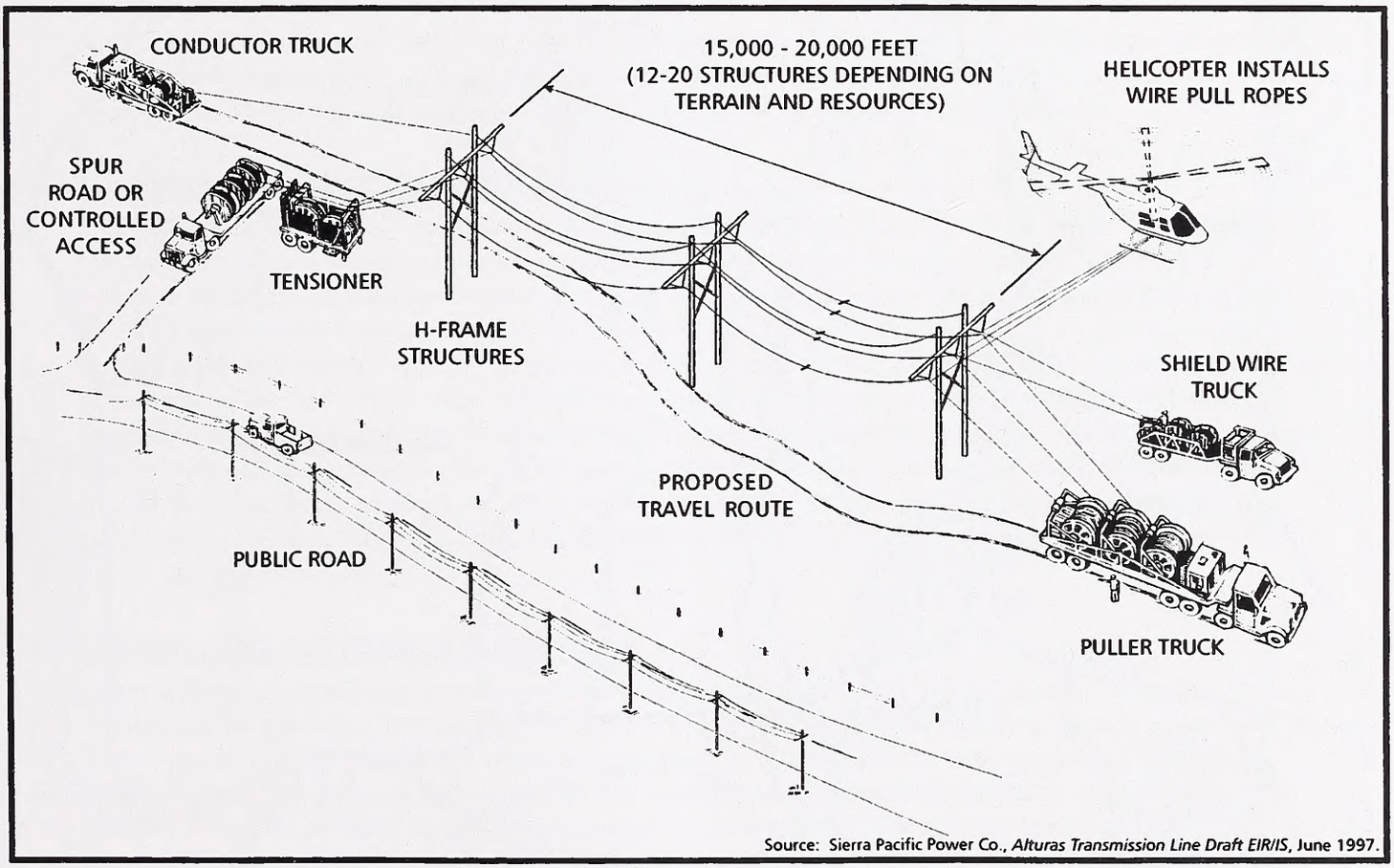

Source: Sierra Pacific Power Co., *Alturas Transmission Line Draft EIR/IS*, June 1997.

Figure 2-9
Wire Stringing

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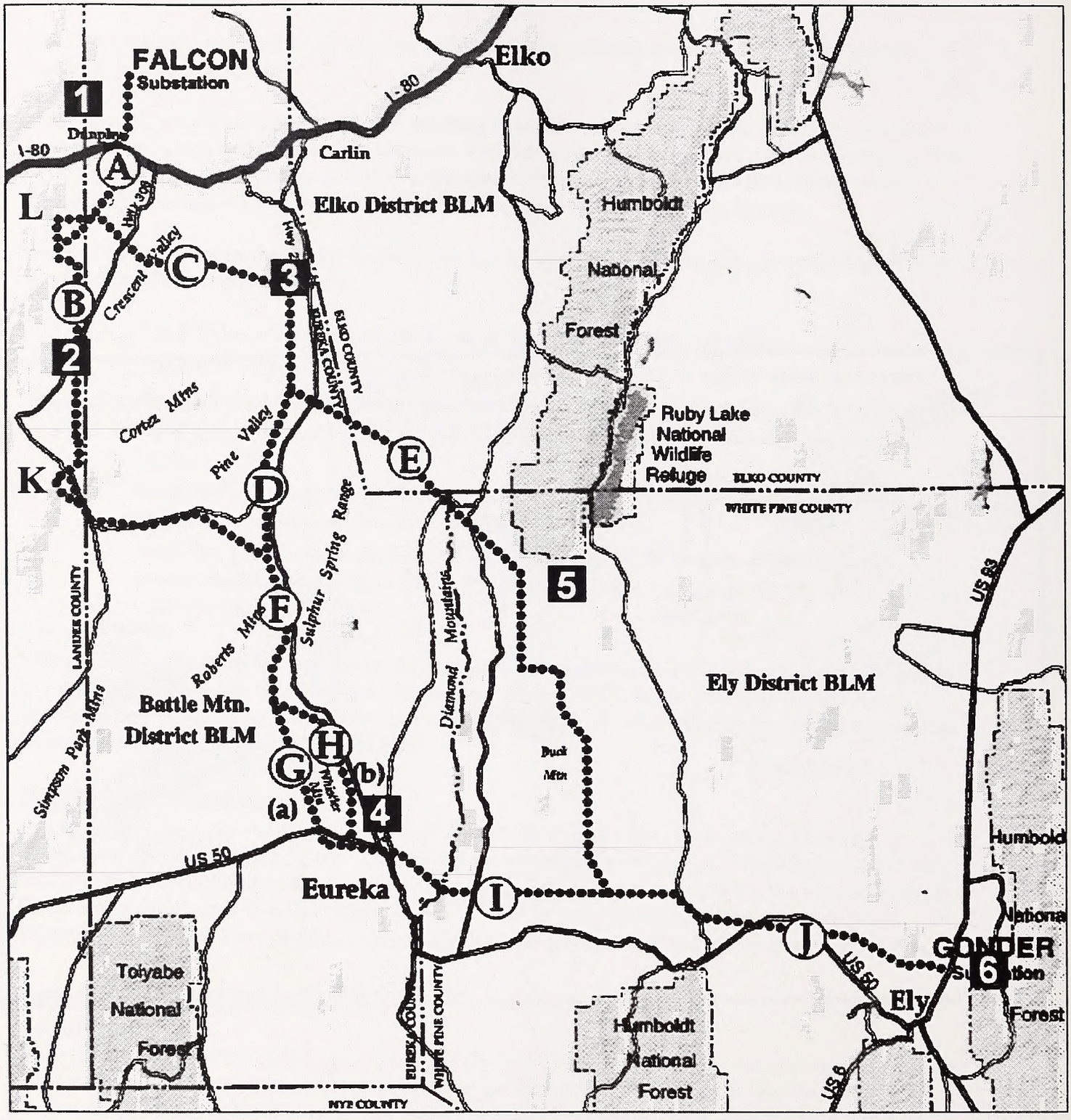

Source: EDAW, Inc., 2000

LEGEND

1 Potential Material Yard Location

●●●●●● Route Alternatives

Crescent Valley (a): (A-B-F-G-I-J)
Crescent Valley (b): (A-B-F-H-I-J)

Pine Valley (a): (A-C-D-F-G-I-J)
Pine Valley (b): (A-C-D-F-H-I-J)

Buck Mountain: (A-C-E-J)

Figure 2-10
Potential Material Yard Locations

Spur Roads and Centerline Travel Route

As described in Appendix E, Reclamation Plan, SPPC would recontour, decompact, and reseed new spur roads and areas disturbed by construction inside the 500-foot study corridor that would not be required for project operation and maintenance. BLM-approved seed mixes would be used. The Reclamation Plan would ultimately become part of the COM Plan and provide detailed mitigation measures for affected special-status species, natural plant communities, and wetlands, as required.

Falcon Substation Equipment Additions

New switching equipment would include three 345 kV power circuit breakers and two 345 kV reactors to control voltage. One reactor would be a fixed reactor continuously connected to the line. The second reactor would be a switched reactor utilized during light loading conditions or during line switching. The existing substation pad and fenced area would be expanded approximately 3.2 acres to the south and east. Painted tubular steel structures would be used to support equipment, conductors, and switches at a safe height to permit personnel, vehicles, and equipment to operate and maintain the substation equipment. The new structures would be painted light tan to match existing structures.

Gonder Substation Equipment Additions

The Gonder substation is owned and operated by both SPPC and Mt. Wheeler Power. The substation pad and fenced area would require an approximate 6.2-acre expansion to the north. New 230 kV buswork would be required to connect to the existing 230 kV ring bus. New equipment includes two 230 kV power circuit breakers, two 345/230 kV 300 MVA transformers, two 345 kV power circuit breakers, and two 345 kV reactors to control voltage. One reactor would be a fixed reactor continuously connected to the line. The second reactor would be a switched reactor utilized during light loading conditions on the line or during line switching. A new control building would be erected. Galvanized or painted tubular steel structures would be used to support equipment and conductors, and switches at a safe height to permit personnel, vehicles, and equipment to operate and maintain the substation equipment. The new structures and control building would be galvanized or painted a light gray color to match existing structures.

Construction Activities at Substations

In the substation expansion areas, topsoil and organic material would be cleared and stockpiled; the site would then be graded and compacted to provide a construction surface for the proposed equipment. The surface would be sloped and other features, such as ditches and culverts, would be installed for adequate drainage. The stockpiled topsoil and organic material would be placed on cut-and-fill slopes. Fencing would be installed around the perimeter of the substation for security and to restrict unauthorized persons and wildlife from entering the substation.

Reinforced concrete footings and foundations would be constructed to support structures and equipment. A foundation is also required for the new control building at the Gonder substation. Buried conduit and/or a covered concrete trench system would be installed throughout the substation for electrical control cables. After trenches are dug, conduit would be placed on a bed of sand, covered with sand, and then backfilled with soil to match the adjacent grade.

The existing ground grid would be expanded into the construction area to ensure that all equipment, structures, and fence additions are properly grounded. The ground grid would be buried approximately 12 inches below grade. Trenches would be dug in both directions across the station and copper conductors installed to create a grid. The conductors would be thermally welded at intersections, and conductor tails brought up next to footings for use in grounding equipment and structures. The trenches would be backfilled with soil to match adjacent grade.

Gravel would be installed over the substation pad to a depth of approximately 3 inches. The gravel particles would be angular and approximately 1 inch in size. A layer of gravel over the substation pad provides electrical isolation for workers. It also reduces fugitive dust, improves access during inclement weather, and inhibits weed growth.

At the Falcon substation, the existing control building has adequate space to accommodate the proposed facilities; at the Gonder substation, a new control building is required. SPPC normally uses pre-fabricated steel buildings for control buildings. Major equipment to be installed inside the control building consists of relay and control panels, AC and DC load centers to provide power to equipment inside and outside the control building, a battery bank to provide a back-up power supply, a heating/cooling system to prevent equipment failure, and communications equipment for remote control and monitoring of essential equipment.

Steel structures would be erected on concrete footings to support switches, electrical buswork, instrument transformers, lightning arrestors, and other equipment, as well as termination structures for incoming and outgoing transmission lines. Structures would be fabricated from tubular steel and galvanized or painted to match the existing structures. Structures would be grounded by thermally welding one or more ground wires to each structure.

Major equipment would be set by crane and either bolted or welded to the foundations to resist seismic forces. Oil spill containment basins would be installed around all major oil-filled equipment. A containment basin usually consists of an impermeable flexible liner system with a clean water pump. The basins are usually filled with gravel for access and safety reasons. Smaller equipment including air switches, current and voltage instrument transformers, insulators, electrical buswork, and conductors would be mounted on the steel structures.

Control cables would be pulled from panels in the control building, through the underground conduits and concrete trench system to the appropriate equipment. After the cables are connected, the controls would be set to the proper settings, and all equipment would be tested before the transmission line is energized.

2.1.2 WORKFORCE AND CONSTRUCTION SCHEDULE

WORKFORCE REQUIREMENTS

Construction of the project would require at least one prime contractor and multiple subcontractors. During peak construction periods, approximately 150 workers would be employed. The peak construction period is expected to last about 9 months of the 15-month project. The construction workforce would include:

- General contractor that specializes in transmission line construction
- ROW access subcontractor
- Logging subcontractor
- Drilling and blasting subcontractor
- Revegetation subcontractor
- Substation subcontractor
- Environmental compliance subcontractor
- Quality assurance subcontractor

The estimated number of workers per activity would include:

- Support equipment: 13
- Yard-haul material: 6
- Road improvement and restoration: 9
- Tower excavation and anchors: 50
- Tower assembly: 25
- Tower erection : 18
- Guard poles: 4
- Wire stringing: 48
- Environmental compliance: 8
- Quality assurance: 5

Because the construction work would be contracted, the geographic region of the work force is not yet known. Local unskilled labor and skilled out-of-town labor factors would depend on local labor market conditions, contractor's labor force availability, construction status, and time of year. Local unskilled labor could be between 30-40% of the total workforce, and skilled out-of-town labor would comprise the rest of the workforce. The contractor would have two options related to worker housing: (1) house the workforce in nearby urban areas and bus them to the jobsites, or (2) erect temporary camps at strategic locations along the selected route. Because the contractor has not yet been selected, it is unknown which housing option would be chosen. It is possible that 100% of the workforce, or 150 workers, would need temporary accommodations near the job site during peak construction periods. Some workers would perform more than one activity.

Construction of the project may progress either in an orderly fashion from one end of the project to the other, with each activity taking place sequentially, or, most likely, it would progress in a rather random pattern around numerous obstacles. Some of the factors that would determine the flow of the work include weather, soil conditions, access to private lands, seasonal environmental restrictions, avoidance of sensitive resources, and the contractor's available resources. Due to the scope of this project, the contractor may have similar activities going at multiple locations. The contractor would provide and maintain a detailed schedule throughout the construction period.

Construction Schedule

Construction of the project is expected to take 14 months or less and, if approved, would begin May 1, 2002 and be complete by June 30, 2003.

Construction Cost

The construction cost for the transmission line would be approximately $340,000 per mile. Depending on the route alternative selected, the cost could range from $57.1 million to $63.2 million. Costs of the substation improvements are estimated at $5.4 million for the Falcon substation and $10.2 million for the Gonder substation. The total cost for the project, including environmental review, permits, administration, lands and rights-of-way is estimated at $91,090,000 to $97,190,000 depending on which route is selected.

2.1.3 OPERATION AND MAINTENANCE

Once the transmission line is operational, SPPC would conduct annual inspections of the line to check for maintenance needs. The annual inspections would be conducted by two SPPC workers on all terrain

vehicles (ATVs) generally following the centerline travel route used for project construction. While the centerline travel route would be revegetated after construction, over time, it can be expected that these annual ATV inspections would create a 12-foot wide two-track path. This path also may be used for required maintenance or emergency repairs.

In environmentally sensitive areas and steep terrain, helicopters may be used to inspect the line. Ground access to the ROW would still be required in these areas for as-needed maintenance and emergency procedures. This access would be coordinated and reclaimed through the appropriate agency personnel. Trees that could interfere with the safe operation of the transmission line would be trimmed or removed as needed over the life of the project. A separate Construction, Operation and Maintenance (COM) Plan would be prepared to ensure that appropriate procedures and mitigation measures outlined in this EIS are implemented.

2.1.4 RIGHT-OF-WAY (ROW) TERM OF AUTHORIZATION

The BLM would authorize the ROW grant for a term of 30 years. Thus, this ROW grant would extend from 2003 to 2033. At the end of this period, SPPC could apply to BLM for renewal of the ROW grant.

2.1.5 ABANDONMENT PROCEDURE

Prior to the ultimate termination or expiration of the federal ROW grant, or any portion thereof, SPPC would contact the BLM Authorized Officer to arrange for a pre-termination meeting and joint inspection of the ROW. The meeting and inspection would be held to agree to an acceptable termination and rehabilitation plan. This plan would include, but not be limited to, removal of facilities and surface improvements, reclamation, reseeding, and monitoring. The Authorized Officer must approve the plan in writing prior to commencement of any termination activities. After completion of the termination activities and upon final inspection and approval by the BLM Authorized Officer, SPPC would relinquish all, or those specified portions, of the ROW.

2.2 ROUTE ALTERNATIVES

2.2.1 BACKGROUND

On March 9, 1999, BLM's Interdisciplinary (ID) Team began a series of meetings with SPPC and environmental consultants from EDAW, Inc. to identify a reasonable range of feasible alternative routes for the transmission line, which would then be subject to environmental review pursuant to the National Environmental Policy Act (NEPA). The goal was to identify route alternatives that would meet the project objectives and minimize adverse environmental impacts. The ID Team consisted of resource specialists from the BLM's Battle Mountain, Elko, and Ely Field Offices, the Nevada Division of Wildlife (NDOW) and the State Historic Preservation Office (SHPO) who shared their professional expertise and unique knowledge of the project area.

The discussion focused on three main routes for connecting the Falcon and Gonder substations:

- a western route through Crescent Valley.
- a central route through Pine Valley.
- an eastern route through the Buck Mountain area.

These routes were identified based on consideration of a number of factors that included: achievement of project goals, maximizing use of designated utility corridors and/or co-locating the transmission line

next to existing utilities, avoiding unsuitable terrain, minimizing impacts to private property owners, and avoiding Wilderness Study Areas (WSAs).

On March 18 and 19, the BLM ID Team, SPPC, and EDAW held a follow-up meeting to review resource data and evaluate and refine the route alternatives. The group discussed potential resource conflicts and alignments that would be the least detrimental to natural resources. Among the issues discussed were cultural resources, noxious weeds, sage grouse habitat, ferruginous hawk nesting areas, antelope habitat, and watershed values at McClusky Pass. The major outcome of these meetings was the decision to remove the eastern route through the Buck Mountain area and modify the central route through Pine Valley.

On April 5 and 6, the group met again to further discuss the route alternatives and potential resource conflicts. The major outcome of these meetings was the reintroduction of a modified version of the eastern route (Buck Mountain). This modification would help avoid ferruginous hawk nests, sage grouse leks and habitat, springs, historic districts, and mule deer habitat. It was also decided to remove a portion of the western route (Crescent Valley) through the Simpson Park and Roberts Mountains to avoid sage grouse habitat and WSAs. Additionally, one of two possible crossings of I-80 was removed to avoid a pristine area of the historic Emigrant Trail.

After these meetings, the route alignments were further refined based on new field survey information about cultural sites and sage grouse lek locations. In addition, two different options were identified for routing the line around Whistler Mountain. This resulted in the creation of the Crescent Valley (a) and (b) route alternatives and Pine Valley (a) and (b) route alternatives, for a total of five final route alternatives. These five route alternatives, which are analyzed this EIS, are shown in Figure ES-1 and described in Table 2-7. To facilitate the analysis and discussion of site-specific resources and conditions, the route alternatives are broken down into individual segments (A through J).

2.2.2 CRESCENT VALLEY ROUTE ALTERNATIVES

As shown in Table 2-7, the Crescent Valley (a) and (b) route alternatives would be about 186 miles long. The Crescent Valley route alternatives are illustrated in Figure ES-1. The Crescent Valley (a) route would parallel an existing 120 kV and 60 kV transmission line from the Falcon substation for all of Segment A and most of Segment B, before turning east in Grass Valley. Segment F would then turn south, parallel with Highway 278 between Roberts Mountains and the Sulphur Spring Range. Segment G would run west of Whistler Mountain until it crosses Highway 50 and turns east. At this point, the route would parallel an existing 230 kV transmission line to the Gonder substation.

Segment I would cross Highway 50 again north of Eureka at the southern end of Diamond Valley and turn southwest crossing the Diamond Mountains near Simpson Creek then into White Pine County. From here the line would run due east, crossing Newark Valley north of the Pancake Range. Segment J would cross the Antelope and Butte Mountains north of Humboldt National Forest and turn southeast. From here the route would cross the northern extent of Jakes Valley, crossing and re-crossing Highway 50, the Egan Range, and the Steptoe Valley to terminate at Gonder substation north of Ely.

The Crescent Valley (b) route alternative would follow the same alignment as Crescent Valley (a), except Segment H would run south on the east side of Whistler Mountain paralleling Highway 278, crossing Highway 50, and turning east parallel to the existing 230 kV line.

TABLE 2-7: ROUTE ALTERNATIVES

SEGMENT	DESCRIPTION	LENGTH
Crescent Valley Alternative (a) – West of Whistler Mountain – 185.9 miles:		
A	From Falcon substation heads south. Crosses I-80, Humboldt River, and Union Pacific Railroad tracks near Dunphy. Turns southwest paralleling Shoshone Range.	16.7 mi.
B	Continues southwest paralleling Shoshone Range, crossing from Eureka to Lander County. Turns due south and crosses Crescent Valley. Crosses Cortez Mountains west of Mt. Tenabo and then turns east across Grass Valley, crossing back to Eureka County. Continues eastward paralleling Pine Creek north of the Simpson Park Mountains. Turns southeast crossing Denay and Garden Valleys and ends near Highway 278. Within Segment B, there are two potential re-routes (i.e., the K and L re-routes), which could be used to avoid sensitive sites.	62.1 mi.
F	Runs south along west side of Garden Valley between Roberts Mountains and Sulphur Spring Range.	16.8 mi.
G	Runs southeasterly on the west side of Whistler Mountain. Crosses Highway 50 and turns east.	19.9 mi.
I	Runs east crossing Highway 50 north of Eureka at the southern end of Diamond Valley and turns southeast. Crosses Diamond Mountains parallel with Simpson Creek before entering White Pine County. Runs east, crossing Newark Valley to the north of the Pancake Range.	30.3 mi.
J	Continues east crossing Antelope Mountains to the north of Humboldt National Forest and then turns southeastward crossing the Butte Mountains. Crosses northern extent of Jakes Valley, crossing and re-crossing Highway 50. Crosses the Egan Range, continuing along Smith Valley, and passing just south of Hercules Gap before crossing the Steptoe Valley to terminate at Gonder Substation north of Ely, adjacent to Highway 93.	40.1 mi.
Crescent Valley Alternative (b) – East of Whistler Mountain – 186.4 miles: **(same as (a), except replace Segment G with H)**		
H	Runs southeast, then south along the east side of Whistler Mountain paralleling Highway 278 before crossing Highway 50.	20.4 mi.
Pine Valley (a) – West of Whistler Mountain – 179.1 miles: **(same as Crescent Valley (a), except replace Segment B with Segments C and D)**		
C	Turns southeast across Crescent Valley, crosses the Cortez Mountains and turns south along Pine Valley, parallel to Highway 278.	35.7 mi.
D	Runs along the eastern side of Pine Valley parallel to Highway 278.	19.5 mi.
Pine Valley (b) – East of Whistler Mountain – 179.5 miles: **(same as Crescent Valley (b), except replace Segment B with Segments C and D, described above)**		
Buck Mountain – 167.3 miles: **(same as Pine Valley (a) except replace Segments D, F, G, I with Segment E)**		
E	Turns southeast and crosses Highway 278 and the Sulphur Spring Range, crossing into Elko County north of Black Mountain. Crosses the north end of Diamond Valley, briefly traversing a corner of Eureka County , before entering White Pine County at the north end of the Diamond Mountains. Crosses Huntington Valley then turns south. Turns east and then south through Buck Pass between Bald Mountain to the north and Buck Mountain to the south. Continues south, first along the east side of Buck Mountain, then along the west side of Dry Mountain.	74.8 mi.

During the field surveys conducted along Segment B, two areas were identified as containing sensitive resources that should be avoided if possible. In response, the "L and K re-routes" were delineated as ways to avoid these areas. As shown in Figure ES-1, the L re-route is in Whirlwind Valley, parallels an existing transmission line, and could be used to avoid visual impacts to cultural resources. The K re-

route is at the northern end of Grass Valley, crosses over a portion of the Cortez Mountains, and could be used as a way to avoid impacts to sensitive resources. The benefits and constraints of these re-routes along Segment B are discussed further in Chapter 3.

2.2.3 PINE VALLEY ROUTE ALTERNATIVES

The Pine Valley (a) and (b) route alternatives would be 179 or 180 miles long, depending on the alignment around Whistler Mountain. The Pine Valley (a) and (b) route alternatives are the same as the Crescent Valley (a) and (b) route alternatives, except that Segment B would be replaced by Segments C and D (see Figure ES-1). Segment C would turn southeast across Crescent Valley, cross the Cortez Mountains, and turn south along Pine Valley, paralleling Highway 278 to the west. Segment D would continue along the eastern side of Pine Valley parallel to Highway 278.

THE PREFERRED ALTERNATIVE

The Pine Valley (a) route has been identified as the environmentally-preferred alternative and the agency's preferred alternative (i.e., the BLM is the Lead Agency). The methodology for selecting the preferred alternative is summarized in Chapter 3, Section 3.20, and detailed in Appendix C.

2.2.4 BUCK MOUNTAIN ROUTE ALTERNATIVE

The Buck Mountain route alternative would be 167 miles long. This alternative would follow the same path as the Pine Valley (a) route alternative, except Segments D, F, G, and I would be replaced with Segment E (see Figure ES-1). Segment E would turn southeast and cross Highway 278 and the Sulphur Spring Range north of Black Mountain, crossing into Elko County. It would then cross the north end of Diamond Valley, briefly crossing into Eureka County before entering White Pine County. The route would then cross the north end of the Diamond Mountains and run into Huntington Valley. The route would turn east and then south crossing Buck Pass between Bald Mountain to the north and Buck Mountain to the south. The route traverses the west side of Dry Mountain. At this point, the line would follow Segment J and parallel the existing 230 kV line to Gonder substation.

2.2.5 NO ACTION ALTERNATIVE

NEPA requires that an EIS include analysis of the "No Action" Alternative, against which the effects of the "action" alternatives can be evaluated and compared. The No Action Alternative in this EIS would mean that no new transmission facilities would be constructed between the Falcon and Gonder substations. Under the No Action Alternative, SPPC would attempt to meet its rapidly growing customer needs with existing facilities, along with other measures to compensate for the anticipated shortfall in the supply of electrical power in the region. The No Action Alternative also would mean that the associated BLM Resource Management Plan amendments would not be required.

Under the No Action Alternative, the projected shortage of electric power in SPPC's control area will continue to grow as customers demand greater amounts of electricity. This shortage is forecast to occur during peak load conditions in the summer of 2003, and may result in the curtailment of some customers. Under this alternative, there will also be a continued shortage of recommended energy reserves during peak load conditions. This existing shortage could result in SPPC's inability to provide service to some customers during unscheduled outages of major transmission or generation facilities. Under the No Action Alternative, adverse environmental, socioeconomic, and electric service impacts could result from compensating actions taken by SPPC to ensure an adequate, affordable, and reliable energy supply to northern Nevada.

If the No Action Alternative is selected following the EIS and right-of-way application review process, SPPC would immediately notify the State of Nevada PUC that it cannot comply with the PUC's Electric Resource Planning Opinion and Order issued April 8, 1999, which found that the Falcon to Gonder 345 kV transmission project is in the public interest. Following notification, SPPC and the PUC would most likely initiate an emergency planning process to determine the best way to meet forecast customer energy requirements.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

The BLM and SPPC considered numerous alternatives to the Proposed Action. This section presents an analysis of the various alternatives eliminated from detailed analysis. These include alternative transmission line route alignments; broader transmission alternatives; and other system, facility, and construction alternatives.

2.3.1 ALTERNATIVE TRANSMISSION LINE ROUTE ALIGNMENTS

Prior to selection of the five route alternatives described above, BLM and SPPC considered other possible routes for meeting the purpose and need of this project.

- McClusky Pass
- Highway 305 Planning Corridor
- Highway 305 Planning Corridor via Antelope Valley
- Southwest Intertie Project (SWIP) utility corridor
- Yucca Mountain Potential Rail Alignment

MCCLUSKY PASS

The preferred alignment in right-of-way application SPPC filed on December 17, 1998, included crossing McClusky Pass near the Lander/Eureka County boundary. However, as described in 2.2.1, there were concerns about impacts to multiple resources including cultural resources, noxious weeds, sage grouse habitat, ferruginous hawk nesting areas, antelope habitat, and watershed values. Therefore, the BLM interdisciplinary team recommended that the McClusky Pass alternative not be analyzed in detail because it would not have represented a true choice for the decision-maker.

HIGHWAY 305 PLANNING CORRIDOR

Battle Mountain Field Office's Shoshone-Eureka Resource Management Plan identifies a "planning corridor" that runs between I-80 and US 50, east of and more or less parallel to State Route 305. To date, no rights-of-way have been requested in this corridor, which was delineated in the mid-1980s. Furthermore, it is now known that this planning corridor crosses wetlands for which protection is mandated under current policy. Therefore, the Highway 305 Planning Corridor was eliminated from further consideration and from detailed analysis as an alternative route for the transmission line.

HIGHWAY 305 PLANNING CORRIDOR VIA ANTELOPE VALLEY

Because of the wetlands now known to exist on a portion of the Highway 305 Planning corridor, the possibility of routing the line (and corridor) further west, through Antelope Valley, was considered. This alignment offered no immediately obvious environmental benefits. Also, the length of this alignment would have exceeded the economic limits of the project as set by SPPC and the State of Nevada PUC. Therefore, this alignment was eliminated from detailed analysis.

YUCCA MOUNTAIN POTENTIAL RAIL ALTERNATIVE

Plans for this rail corridor project were evolving at about the same time that SPPC and BLM were finalizing selection of the Falcon to Gonder route alternatives. Definitive information was not available in time for serious consideration of this alternative as an option. However, initial concerns were raised by BLM regarding the safety and compatibility of designating a utility alternative near a route for trains carrying spent nuclear fuel, as well as concerns about crossing Grass Valley, which is a prime area for sage grouse and their habitat. Furthermore, the rail corridor follows a different direction than the proposed Falcon to Gonder project (i.e., heading southwest while Falcon to Gonder heads in a southeast direction). Thus, this alternative was not a realistic option and was eliminated from further consideration.

2.3.2 OTHER SYSTEM, FACILITY, AND CONSTRUCTION ALTERNATIVES

In addition to transmission line routing alternatives, SPPC considered alternatives related to substation improvements, system enhancements, generation facilities, project combinations, transmission technologies, voltage levels, DC transmission, underground construction, tower types, and stringing methods. These are addressed below.

SUBSTATION ALTERNATIVES

The Falcon substation was chosen as a terminal for the project because of the voltage support it brings to the Carlin Trend mining area. The project could have been terminated at the Valmy substation, 15 miles northwest of Battle Mountain, next to SPPC's Valmy generating station. This option was not selected because it does not optimize the utilization of 36 miles of existing 345 kV line between the Falcon and Valmy substations. This option would also have increased project costs by approximately $10 million.

Further, a connection at Valmy would not provide the benefits of voltage support and an additional 345 kV source to the Carlin Trend area. Selection of the Valmy termination option would also have ignored the fact that the Falcon substation was sited and designed to optimize the potential for future expansion. Alternatives to terminating the east end of the line at the Gonder substation were not considered, because it is at the eastern-most boundary of SPPC's control area where capacity is available from two existing 230 kV lines from Utah.

SYSTEM ENHANCEMENT ALTERNATIVES

System enhancement alternatives could indirectly satisfy some of the project objectives. SPPC modeled various reactive devices to test improvement in system performance. These included shunt compensation, series compensation, and static VAR compensators (SVCs). The high cost of SVCs and synchronous condensers is only justified if the problem is a transient occurrence. For the steady state voltage deviations SPPC is seeing as limiting constraints to increased system import capability, shunt compensation and series compensation are the preferred technologies.

SPPC improved the import benefit of several transmission alternatives using compensating devices, but the level of improvement would be less than constructing one of the 230 kV or 345 kV projects mentioned above. The import limit of the proposed Falcon to Gonder project would benefit from the installation of shunt capacitor banks. SPPC is currently undertaking measures to install four shunt capacitor banks in existing substations by June 2001 to capture the associated system import benefits both before and after construction of the Falcon to Gonder 345 kV project. Three of the proposed capacitor banks are in SPPC's system: one in the Hilltop substation near Alturas, California; one in the Humboldt substation north of Elko, Nevada; and one in the Austin substation near Austin, Nevada. The fourth shunt capacitor bank is proposed in PacifiCorp's Pavant substation in Utah.

GENERATION ALTERNATIVES

The State of Nevada PUC and the FERC conditioned the merger of SPPC and Nevada Power Company, completed in mid-1999, upon the timely divestiture of both utilities' generating facilities. The divestiture of SPPC's generating facilities is also consistent with SPPC's strategic focus on transmission and distribution, and electric utility restructuring. However, the Governor, the State of Nevada PUC, the Nevada Bureau of Consumer Protection, and the State Legislature are closely reviewing the current laws and proposed divestiture of both utilities' generating facilities, which may delay or prevent the sale of SPPC's generating assets.

For purposes of comparison to the project, SPPC's 1998–2017 Amended Electric Resource Plan considered a broad range of generation options (which could be pursued by SPPC, other utilities, or independent power producers, as generation costs should be consistent for all potential developers within this region). SPPC utilized a screening process to determine the best generation resources for further consideration, and four generation options were evaluated. The generation alternatives did not provide all of the benefits of the project, such as additional import capability, additional export capability, or new wheeling opportunities.

Generation additions could, however, provide improved reliability and free up some transmission capacity that would then be available for new system imports. Also, if the generation addition was an inexpensive source of power, costing less than importing outside generation, the transmission benefit of access to the external power market could be diminished. Because SPPC has been ordered to divest its power plants and would no longer be in the power generation business, the only alternative SPPC can legally pursue to provide additional capacity is the addition of new transmission facilities.

ALTERNATIVE COMBINATIONS

The primary objectives of the project could be met, at least partially, by combining two or more alternatives. However, combining alternatives would not provide all of the secondary benefits and would be more costly when compared to the proposed Falcon to Gonder project.

ALTERNATIVE TRANSMISSION TECHNOLOGIES

Voltages

The maximum voltage used for major AC transmission lines throughout the western United States is 500 kV. SPPC proposes a 345 kV transmission line because it is the most cost-effective while creating the least disturbance to the land it would traverse. Higher voltages would require more substantial facilities, typically creating greater adverse impacts to the environment. Lower transmission voltages would not provide the same level of import benefit. For the Falcon to Gonder project, the import improvement is

approximately 30 MW, or 11.5% greater operating at 345 kV than at 230 kV. The voltage support to the Carlin Trend mining areas is also greater. In addition, SPPC has chosen the 345 kV voltage level as its preferred interconnection voltage with other utilities.

Direct Current Transmission

Direct current or DC transmission are rarely suitable for projects of this voltage or length. A 345 kV AC system was selected because it has a shorter construction schedule, substantially lower cost, and would allow more flexibility for future connections to other systems. Direct current or DC transmission lines would require a longer time to construct at a substantially higher cost because each DC terminal installation (i.e., stations that convert AC power to DC power and vise versa) is a unique and highly technical installation. Because of these unique and expensive DC terminal installations, there would also be considerable difficulty and expense to connect the DC system to any intermediate AC systems in the future. Therefore, this type of alternative was eliminated from further evaluation.

Underground Construction

Though very few in number, underground transmission systems have been constructed in the United States since the late 1920s. Underground lines are common for lower voltage distribution lines in urban areas. However, high voltage (115 kV or higher) underground installations have been constructed for short distances where overhead lines were not feasible, such as near airports or urban centers.

Underground high voltage transmission lines require extensive cooling systems to dissipate heat. For this reason, there are currently no underground transmission systems above 230 kV longer than approximately 25 miles in the United States. Cooling systems are complex, expensive, and often involve environmentally hazardous insulating materials. A 345 kV installation would consist of a 10- to 12-inch steel pipe filled with insulating oil pressurized to approximately 200 pounds per square inch (psi). If the pipe leaks or ruptures, usually due to corrosion or accidental excavation, there is the risk of soil and groundwater contamination. Underground systems are also vulnerable to failures caused by flooding, seismic events, and cooling system failures.

If an underground transmission line fails, it is much more difficult to repair. Due to the specialized technology, it can take weeks or even months to repair an underground transmission line compared to hours or days for an overhead line. This difference would have a large impact on the reliability of SPPC's transmission system, since the project is such a critical supply facility. The cost of undergrounding a high voltage transmission line is also estimated to be over 10 times more expensive than traditional overhead construction. It is economically infeasible for SPPC to build the proposed line underground.

The environmental impacts of an underground transmission line would be similar to those for construction of a major pipeline. Typical construction would require a continuous trench between substations. Greater adverse environmental impacts would be expected because a greater amount of the ROW would be disturbed. Overhead transmission line construction typically results only in disturbances at individual tower sites, substations, and associated access to the ROW.

The principal environmental advantage of an underground transmission line would be the reduction of adverse visual impacts. However, an underground transmission line would still require enclosed cooling system facilities located above ground. Due to the technical complications, potentially greater environmental impacts, economic unfeasibility, and the time required for repairs, an underground alternative was eliminated from further consideration.

ALTERNATIVE TOWER TYPES

Guyed steel lattice towers were considered as an alternative to the tubular steel H-frame towers. The lattice tower is SPPC's predominant tower type for this voltage in northeastern Nevada, but they have used H-frame towers on other 345 kV projects. While the guyed steel lattice towers are 5-10% less expensive than the H-frames, they were not selected because they have greater surface area for raptor perching and nesting (considered a negative in this area by BLM wildlife biologists), create a more pronounced visual contrast with the surrounding landscape, require four anchors and guy wires, and usually need more frequent maintenance.

ALTERNATIVE STRINGING METHODS

The use of ground-based equipment for stringing conductors and shieldwires for this project was considered but eliminated in favor of using helicopters for this procedure. The ground-based equipment (usually a bulldozer) causes greater ground disturbance and environmental impacts and can be more time-consuming and expensive.

2.3.3 TRANSMISSION ALTERNATIVES PRESENTED TO PUBLIC UTILITIES COMMISSION

In the initial phases of the planning process, SPPC considered an extensive range of transmission options during the Electric Resource Planning process (as described in Chapter 1) to identify projects to be proposed to the State of Nevada PUC. Ten potential projects were initially identified as having the highest potential for meeting SPPC's goals:

1. Falcon to Gonder 345 kV line (which was ultimately selected as the best option)
2. Frenchman 230 kV Tap
3. Hilltop to Captain Jack 345 kV line
4. Hilltop to Malin 230 kV line
5. Oxbow to Falcon 345 kV line
6. Pacific DC Intertie 500 kV Tap
7. Southwest Intertie Project (SWIP) 345 kV Line and Tap
8. Falcon to Midpoint 345 kV line
9. Falcon to Terminal 345 kV line
10. PG&E 230 kV Intertie

A "fatal flaw" analysis was performed with the following parameters:

- **Feasibility of acquiring the necessary permits.** Projects with a low probability of acquiring the necessary permits were excluded from further investigation.
- **Interconnected utility's ability to deliver the source.** Projects that connected to utilities that have demonstrated problems delivering energy to the interconnection point were excluded from further investigation.
- **Schedule.** Projects with unacceptably late in-service dates were excluded from further consideration.

FALCON TO GONDER 345 KV LINE

The Falcon to Gonder project (i.e., the proposed project in this EIS, which was selected as the best option by the State of Nevada PUC) would be a 165-185 mile long, 345 kV transmission line connecting

SPPC's Falcon substation to 230 kV facilities at Mt. Wheeler Power's Gonder substation. It would optimize the use of two existing 230 kV transmission lines from Utah. It would be located entirely within Nevada, which should simplify permitting. It would improve import and export capabilities and enable SPPC to provide transmission service between Nevada, Idaho, Utah, and the Northwest. Additional transmission capability into PacifiCorp's Utah system is desirable because of the electrical strength and the transmission service opportunities in that system. It also gives SPPC an additional strong interconnection point, which allows SPPC to be less dependent on any one transmission line. The estimated total construction cost is between $73.4 million and $80.4 million, depending on the route alignment selected, and the calculated system import improvement is 260 MW.

FRENCHMAN 230 KV TAP[1]

The Frenchman 230 kV Tap option would have involved connecting SPPC's existing 230 kV transmission line to Oxbow Geothermal's existing 230 kV transmission line. A connection could be constructed where the two 230 kV lines are close to each other, approximately 30 miles east of Fallon, Nevada. Oxbow's 230 kV line connects to Southern California Edison's system near Bishop, California. The connection between the SPPC and Oxbow 230 kV lines could be made through a phase shifting transformer, which would regulate the flow of energy. Although the import benefit of this alternative would be limited to just 30 MW, the project would be competitive and provide transmission service opportunities with the California Independent System Operator. Because this project requires very little transmission line construction, permitting was expected to be fairly straightforward. The estimated total cost would have been $14,500,000, and the calculated system import improvement is 30 MW.

HILLTOP - CAPTAIN JACK 345 KV LINE

This project would have reinforced the Alturas project, SPPC's existing 345 kV transmission line between Alturas, California, and Reno, Nevada, by reinforcing the line's source at Hilltop Substation. This project would have required a new phase shifting transformer at Bordertown, Nevada, a new 500/345 kV transformer at Captain Jack, and approximately 80 miles of new 345 kV transmission line from SPPC's Hilltop substation to the jointly owned 500 kV Captain Jack Substation in southern Oregon. The Northwest system has capability to supply this tie. The issues that arose with California utilities and Northwest energy rights during the Alturas project would likely have reappeared with this project. Permitting through the Modoc National Forest could be difficult. While this project would have increased SPPC's capability to and from the Northwest, it is reinforcement that would not increase system interconnection diversity. No export capability would have been provided by this project, because an outage on the existing Alturas to Reno 345 kV transmission line is still the critical contingency. The estimated total cost was $90,500,000, and the calculated system import improvement is 200 MW.

HILLTOP – MALIN 230 KV LINE

This project would also have reinforced SPPC's Alturas project with a second 230 kV transmission line from Hilltop Substation near Alturas, California, to Malin Substation in southeast Oregon. A second 500/230 kV transformer at Malin was not included. This project had unsatisfactory performance and was eliminated as a viable option because of the large amount of reactive support required to overcome

[1] A tap project is similar to a substation project, and usually involves the minimal amount of transmission line facilities required to connect an existing facility to another utility's facility. The Frenchman 230 kV Tap project is simply an electrical connection between SPPC's existing 230 kV line and Oxbow's existing 230 kV line at a location where they are close to each other, and does not require more than a few spans of transmission line. Transmission line projects require miles of transmission line between two points to provide system benefits.

high impedance along the transmission path. The estimated total cost was $67,700,000, and the calculated system import improvement is 100 MW.

OXBOW - FALCON 345 KV LINE

This project would have included a new 345 kV line running from Oxbow Geothermal's plant in Dixie Valley, Nevada, to SPPC's Falcon substation. It also would have required construction of the Frenchman 230 kV Tap project. Its cost and capability made it less competitive than other options. The main limitation of this option was that it relies on SPPC's already constrained 230 kV transmission line to Utah as its source, after loss of SPPC's 345 kV transmission line to Idaho. The estimated total cost was $63,400,000 in addition to the Frenchman 230 kV Tap costs, and the calculated system import improvement is 70 MW.

PACIFIC DC INTERTIE 500 KV TAP

A 500 kV DC Tap near Fernley, Nevada, of the existing Pacific DC Intertie between the Pacific Northwest and southern California would have created SPPC's most capable transmission interconnection. Studies completed by the BPA in 1992 showed a 400 MW import benefit to SPPC's system. The existing PG&E 120 kV transmission lines limited the import benefit. Completion of the Alturas project in 1998 relieved the stresses on those lines, and it is likely that a tap of the DC line would be capable of approximately 500 MW of import benefit. Preliminary power flow analysis confirmed SPPC's ability to utilize up to 500 MW of import benefit from this tap without violating reliability criteria. A 500 kV DC power connection is a unique and highly technical project, but it is proven technology.

However, because each application is a custom design, there is more financial risk and chance that the schedule would take longer. Also, the availability of capacity on the DC line (firm vs. non-firm) and the existing contractual rights and obligations were not known. The line is jointly owned by BPA, Los Angeles Department of Water and Power, Southern California Edison, and other California utilities, and could provide substantial wheeling capabilities throughout the West Coast for SPPC. The estimated 6-year schedule for this project eliminated it from consideration. The estimated total cost was $141,420,000, and the calculated system import improvement is 500 MW.

SOUTHWEST INTERTIE PROJECT 345 KV LINE AND TAP

The Southwest Intertie Project (SWIP) is a proposed 500 kV line running the length of Nevada's eastern border from Idaho Power Company's (IPC) Midpoint Substation to Nevada Power Company's Harry Allen or Crystal Substation. If the SWIP line were built, SPPC would then construct a tap project off of it. However, SPPC does not have confidence that SWIP will be built and available for SPPC's use before 2008. For that reason, it was not considered an option. The estimated total cost for just the tap project was $92,885,000, and the calculated system import improvement is 350 MW.

FALCON TO MIDPOINT 345 KV LINE

This project would have involved a new 224-mile, 345 kV transmission line running from SPPC's Falcon substation to IPC's Midpoint substation. The Falcon Midpoint line was an attractive option upon initial inspection. Its electrical performance and cost made it competitive with several other projects. However, further investigation revealed serious problems that would restrict SPPC's ability to use this line. IPC has documented an inability to source existing transmission requirements. The limitations demonstrated over the last 3 years, and the curtailment of transmission customers as recently as the

summer of 1998, lead SPPC to believe that without IPC's commitment to system improvements in the Midpoint to Boise area, it would be unwise for SPPC to consider a second high capacity transmission line to the Midpoint location. The estimated total cost was $113,060,000, and the calculated system import improvement is 350 MW.

FALCON TO TERMINAL 345 KV LINE

This project would have involved a 316-mile long system of 345 kV lines running from SPPC's Falcon substation to a new substation near Wells, Nevada. From there, it would interconnect both with SPPC's existing 345 kV line to Idaho at a new substation located north of Wells, and with PacifiCorp's Terminal substation in Salt Lake City. The project had very good performance and cost/benefit characteristics; however, it was the most capital intensive of all the transmission projects examined. The potential for other utilities to participate in this project no longer exists due to other arrangements made between BPA and PacifiCorp. The benefits of a connection to Utah's transmission system apply to this project. Crossing the Utah salt flats could have either complicated the environmental permitting process or forced longer alternatives. Because of the requirement for urban construction near Salt Lake City and the more difficult construction across the salt flats, the cost of the line from Wells to Terminal was increased. The estimated in-service time of 5 years eliminated this project from meeting SPPC's current needs. The estimated total cost was $184,245,000, and the calculated system import improvement is 500 MW.

PACIFIC GAS & ELECTRIC 230 KV LINE

This project would have involved a new 230 kV line to replace the two existing 120 kV circuits connecting Reno to PG&E's system over Donner Summit. It would have connected to PG&E's Rio Oso or Gold Hill substations. SPPC's environmental group has advised that it may not be possible to permit a Trans-SPPC tie to PG&E. In addition to this potential fatal flaw, there could be a voltage collapse problem around Sacramento. Rio Oso and Goldhill are subject to voltage instability under high load conditions. Until this problem is fixed, PG&E's system is not capable of sourcing another 230 kV line. The California utilities have not expressed an interest in upgrading the existing 120 kV lines. For these reasons, the PG&E tie was not further investigated. The estimated total cost was $102,100,000, and the calculated system import improvement is 200 MW.

RESULTS OF THE SCREENING PROCESS

The results of this analysis identified five of the ten transmission options as fatally flawed. The fatal flaws are summarized below.

- Pacific DC Intertie 500 kV DC Tap - in service time of 5 years.
- Southwest Intertie 345 kV Line and Tap - in service time of 10 years.
- Falcon - Midpoint 345 kV Line – demonstrated need for improvement in IPC's source system prior to construction. The necessary reinforcements have not been planned, approved, or scheduled for construction.
- Falcon - Terminal 345 kV Line – in service time of 5 years due to permitting issues and scope of facilities required.
- Pacific Gas & Electric 230 kV Line – unlikely to be permitted across the SPPC Nevada Mountains without extreme difficulty, and documented voltage collapse potential at the western terminal of the project near Sacramento, California.

After these fatal flaw analyses were completed, a performance matrix was developed from the power flow, cost, schedule, environmental permitting, and external capability data gathered on each project. The resulting matrix clearly illustrated that three projects substantially outperformed the others both electrically and economically:

- Falcon to Gonder 345 kV line
- Frenchman 230 kV Tap
- Hilltop to Captain Jack 345 kV line

These projects were similar in complexity, and the estimated cost was within $100/kW for the import benefit. After these projects, a substantial gap in import benefit of over $200/kW occurred before the next best option (Hilltop to Malin 230 kV line). From the three best options, the third (the Hilltop to Captain Jack 345 kV line) was eliminated due to higher cost vs. benefit, more difficult permitting, and probable contention over northwest energy rights by California utilities at Captain Jack.

SPPC presented the results of this Energy Resource Planning screening process to the Public Utilities Commission of Nevada on December 15, 1998. After an evidentiary hearing in March 1999, the State of Nevada PUC made a unanimous decision, on April 8, 1999, that the Falcon to Gonder 345 kV line was the best resource option to meet the forecasted energy needs of SPPC's customers. The State of Nevada PUC found that SPPC's alternative plan, which includes the Falcon to Gonder 345 kV line and the Frenchman 230 kV Tap project, are superior to SPPC's preferred plan, which was only the Falcon to Gonder 345 kV line.

The State of Nevada PUC found that the alternative plan was superior to the preferred plan because it included the Frenchman Tap 230 kV project, which would provide for an additional 30 MW of import capability to be available by the summer of 2000 to help mitigate SPPC's WSCC reserve margin deficits until the Falcon to Gonder 345 kV line could be completed. Furthermore, the Frenchman Tap 230 kV project could provide up to 100 MW of import capability from southern California at a low cost per kW once the Falcon to Gonder 345 kV line is in service. At the time of the State of Nevada PUC's Opinion and Order, the expected in-service date of December 2001 for the Falcon to Gonder 345 kV line was found to be in the public interest. Since then, changes related to environmental permitting and longer construction timeframes have delayed the expected in-service date to June 2003.

CHAPTER 3

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Chapter 3 describes the existing environment in the project study area (i.e., the potentially "affected environment") and assesses the environmental consequences that would occur with construction, operation and maintenance of the Falcon to Gonder project. This chapter also identifies mitigation measures to reduce or avoid adverse impacts. Environmental consequences of the no action alternative are also considered.

This chapter analyzes five project route alternatives and the no action alternative from the perspective of 19 resource topics:

3.1 Geology and Minerals
3.2 Soils
3.3 Water Resources
3.4 Vegetation (including Wetlands)
3.5 Invasive Nonnative Species
3.6 Wildlife and Wildlife Habitat
3.7 Special-Status Species (Animals and Plants)
3.8 Range Resources (Livestock Grazing and Wild Horses)
3.9 Visual Resources
3.10 Public Health and Safety (Fire Management, Hazardous Materials and EMFs)
3.11 Noise
3.12 Air Quality
3.13 Land Use and Access
3.14 Recreation/Wilderness
3.15 Social and Economic Values
3.16 Cultural Resources
3.17 Paleontology
3.18 Environmental Justice
3.19 Native American Concerns

Section 3.20, Comparison of Alternatives, provides a summary of the impacts and the methodology that was used to select the preferred alternative.

3.0.1 BLM CRITICAL ELEMENTS

This EIS discusses the following "Critical Elements," which are mandated for consideration by BLM policy and various government regulations:

• Air Quality	*(see Section 3.12)*
• Areas of Critical Environmental Concern	*(There are no designated Areas of Critical Environmental Concern in the project area)*
• Cultural Resources	*(see Section 3.16)*
• Environmental Justice	*(see Section 3.18)*
• Farmlands, prime or unique	*(There are no prime or unique farmlands in the project area)*
• Floodplains	*(see Section 3.3)*
• Invasive, Nonnative Species	*(see Section 3.5)*

- Migratory Birds *(see Section 3.6)*
- Native American Religious Concerns *(see Sections 3.16, 3.19)*
- Special-Status Species *(see Section 3.7)*
- Wastes, Hazardous/Solid *(see Section 3.10)*
- Water Quality (Surface and Ground) *(see Sections 3.2, 3.3)*
- Wetlands / Riparian Zones *(see Sections 3.3, 3.4)*
- Wild and Scenic Rivers *(There are no designated Wild and Scenic Rivers in the project area)*
- Wilderness *(see Section 3.14)*

3.0.2 APPROACH AND FORMAT OF ANALYSIS

As shown below, the five route alternatives share many of the same segments and, thus, many of the same environmental impacts:

- Crescent Valley (a) route alternative (Segments A-B-F-G-I-J)
- Crescent Valley (b) route alternative (Segments A-B-F-H-I-J)
- Pine Valley (a) route alternative (Segments A-C-D-F-G-I-J)
- Pine Valley (b) route alternative (Segments A-C-D-F-H-I-J)
- Buck Mountain route alternative (Segments A-C-E-J)

To avoid redundancy and facilitate comparison of the alternatives, the following sections analyze:

1. Impacts common to all route alternatives, and
2. Alternative-specific impacts (i.e., those that are unique to a particular alternative).

Evaluation of the no action alternative is also provided. This information is then summarized in Section 3.20, Comparison of Alternatives, which also describes the methodology for selection of the preferred alternative. **The BLM's preferred alternative is the Pine Valley (a) route alternative.**

K and L Re-Routes

During the 1999 field surveys that were conducted along Segment B, two areas were found to contain sensitive resources that should be avoided if possible. The "K and L re-routes" were delineated as potential ways to avoid these areas. As shown in the previous Figure ES-1, the K re-route is at the northern end of Grass Valley and crosses over a portion of the Cortez Mountains. The L re-route is in Whirlwind Valley and parallels an existing transmission line.

In the early stages of this environmental analysis, it became clear that the L re-route offers real advantages and would most likely be incorporated into Segment B if one of the Crescent Valley route alternatives were selected. Thus, to facilitate the analysis and the accurate quantification of data, many of the tables in the following chapter assume that Segment B would follow the L re-route around Whirlwind Valley.

The K re-route conversely was found to have clear disadvantages related to visual impacts, steep terrain, accessibility and biological impacts to nesting raptors. Thus, it would not likely be incorporated into Segment B. However, the advantages and disadvantages of the K and L re-routes, as well as the original Segment B alignment, are evaluated fully in this chapter.

3.1 GEOLOGY AND MINERALS

3.1.1 AREA OF ANALYSIS AND METHODOLOGY

The focus of study for geologic constraints and hazards is the transmission line corridor and surrounding area within approximately 0.5 mile. The area of analysis for minerals encompasses the area within approximately 4 miles of the transmission line route alternatives for mines and within 10 miles for general mining districts. The method of analysis was predominantly integration of published geologic information and interpretation of large-scale (1:24,000) U.S. Geological Survey (USGS) topographic maps. The Nevada Bureau of Mines and Geology (NBMG) maintains various mining-related databases, including active mines and oil, gas and geothermal wells that were accessed in preparing this EIS. Results of the database inquiry are presented separately in a technical memorandum: "Active Mines, Oil/Gas Wells and Geothermal Wells Within 10 Miles of the Falcon to Gonder Transmission Project" (EDAW 2001). Leasable oil, gas and geothermal resources in the study area were not inventoried in detail as the transmission line would not be expected to substantially interfere with extraction operations. These resources can usually be tapped at several locations, and angle drilling to tap the resources can be done to avoid transmission line towers. Analysis of potential conflicts with these types of leasable resources is more appropriate in the COM Plan, in which the exact locations of the towers will be identified and impacts can be avoided or mitigated as appropriate.

REGULATORY FRAMEWORK

Grading

On federal lands, construction and grading are regulated by the BLM under the use permits issued for development projects. As part of the right-of-way grant, the BLM requires that a COM Plan be developed, approved by the BLM, and implemented by the applicant. The COM Plan must be developed following the guidelines in the most recent edition of the BLM Rights-of-Way Construction Operation and Maintenance Plan. This plan provides guidance on clearing, blasting, erosion control, protection of resources, revegetation, and restoration and other elements. Construction on slopes is given particular attention because of potential soil erosion, health and safety hazards, and water quality concerns. (See also Section 3.2, Soils.)

In areas under local government jurisdiction, grading and construction are regulated through local use permits and grading permits in compliance with local ordinances. New construction generally must meet the requirements of the most recent version of the Uniform Building Code, including sections dealing with natural hazards from unstable and corrosive soils and earthquakes.

Mining

The Federal Mining and Mineral Policy Act of 1970 established a policy of the federal government to foster and encourage the development of mining of locatable minerals (hard rock), as well as other materials (aggregate, quarried dimension stone, and other resources). However, under provisions of the Federal Land Policy and Management Act of 1976 (FLPMA) as well as NEPA, exploration, development, and operation of mines and associated roads must also be considered in relation to their potential conflicts with other resource values and potential to affect the environment. Alternatives for oil and gas leasing are defined through consistency with land use designations in BLM Manual 1624. As a result, the BLM has adopted Resource Management Plans for each of the three districts through which the proposed transmission line would trend and has designated areas open to leasable resource (including oil, natural gas, and geothermal resources) development. In general, BLM has five designations for oil/natural gas and geothermal leases:

1. Open to leasing, subject to standard leasing stipulations limited;
2. Open to leasing with major restrictions, no surface occupancy (to protect other resources such as sage grouse strutting grounds and special recreation management areas);
3. Open to leasing with minor restrictions (e.g., subject to seasonal restrictions as related to seasonal wildlife activity periods, such as mule deer winter and spring ranges, chukar habitat, golden eagle habitat, etc.);
4. Closed to leasing based on discretionary considerations (e.g., recreations sites, natural features, National Register District); and
5. Closed to leasing based on nondiscretionary considerations (e.g., wilderness areas to be protected) (BLM 1992).

For the BLM's Ely District, areas for mineral exploration and development are designated and subject to management under a Geologic Area Management Plan that details the management practices and allowable uses needed to protect the area (BLM 1987).

Mining is also regulated by the State of Nevada and local government. With regard to environmental compliance requirements, the Nevada Division of Environmental Protection requires compliance with the National Pollutant Discharge Elimination System (NPDES) under the federal Clean Water Act for all surface and groundwater discharges from mining and other operations. Mining regulation under the local General Plans are discussed in the Land Use section of this EIS (Section 3.13). Construction grading is regulated under local grading ordinances.

Fossils

Disturbance of rocks and sediments with notable paleontological resources are also protected under federal and state laws. See discussion in Section 3.17, Paleontology.

3.1.2 AFFECTED ENVIRONMENT

REGIONAL GEOLOGIC SETTING

The Falcon to Gonder project is located in the Great Basin subsection of the Basin and Range Physiographic Province. The Great Basin subsection is further subdivided; the project area is located in the Central Area. The region as a whole, including the Central Area, has a complex geologic history, with the area at times a region of marine sediment deposition and volcanism, and at times uplifted with erosion, terrestrial sediment deposition, and volcanic rock formation (BLM 1992). In the early Paleozoic Era (570 million – 225 million years before present [b.p.]), the region was a marginal coastal zone with deposition of sediments in a geosynclinal (downwarp) area. The resultant rocks are marine shales and limestones with some carbonates. Subsequently, in the middle Paleozoic Era, the region experienced a period of compressional orogeny (uplift, compression, and mountain building). A subduction zone was established to the west, and a volcanic island arc formed with a foreland basin. Sediments consisting of shale, limestone, clastic sand, and silt formations were also deposited. Renewed orogeny occurred in the late Paleozoic Era and included volcanism, followed by a period of subsidence in which marine environments reestablished themselves. In the Jurassic Period (195 – 136 million years b.p.), episodes of sediment deposition occurred, and the region experienced the onset of the Rocky Mountain uplift (a.k.a. Cordilleran Orogeny). During the Cretaceous Period (136 – 65 million years b.p.), compression resulted in folding and faulting as well as volcanism. From the middle Cenozoic Era (65 million years b.p.) to the present, extensional forces developed with the Basin and Range. As a result, high angle faulting created semi-parallel range building interspersed with long valleys on a general north-south axis. Valley fill occurred within the area from the erosion of the mountain blocks. Volcanic activity was renewed.

The region at present is characterized by a structural geologic system of upraised fault blocks forming semi-parallel mountain ranges separated by down-dropped inter-range areas, typically graben structures (down-dropped blocks) that have been filled to great depths by alluvium. The structures are aligned on predominantly north-south axes. The ranges are predominantly linear in form and separated by valleys, many of which are closed basins. Some ranges, such as the Diamond Mountains, are oriented almost due north-south. Others, like the Cortez and Sulphur Spring Range, are oriented more northeast-southwest. The orientation of the ranges is reflected in the parallel arrangement of the intervening valleys, such as Crescent Valley and Pine Valley. The key mountain ranges in the study area from north to south include the Shoshone Range, Cortez Mountains, Pinyon Range, Roberts Mountains, Sulphur Spring Range, Whistler Mountain, Mahogany Hills, Diamond Mountains, Buck Mountain, Butte Mountains, and Egan Range. The relief between the mountain ranges and the adjacent valleys is substantial, typically on the order of 1,000 to 3,000 m (USGS topographic maps). The base of each range commonly is lined by pediment slopes and alluvial aprons that are inclined at low angles, and stretch broadly to the flat-floored valleys. Key valleys in the study from north to south include Boulder Valley, Crescent Valley, Grass Valley, Denay Valley, Huntington Valley, Garden Valley, Diamond Valley, Pine Valley, Newark Valley, Smith Valley, and Steptoe Valley.

The fault block structures of the region are the product of extensive faulting that is characteristic of the region between the Rocky Mountains on the east and the Sierra Nevada on the west. Faulting occurred as early as the Cretaceous Period in some areas, and the current interpretation is that there were two primary periods of faulting and orogeny. The older event occurred sometime during the late Mesozoic Era (Cretaceous Period) and the early Cenozoic Era, and the younger episode may have started in the middle Cenozoic era (Oligocene Epoch) and reached a climax in the late Miocene Epoch or early Pliocene Epoch (Hose and Lake 1976; Stewart and McKee 1977). The latter Cenozoic Era episode is referred to as the Basin and Range Orogeny. While some mountain ranges may be remnants of the earlier orogeny, most of the characteristic topography of the region has been a product of the younger orogeny (Hose and Blake 1976). The Basin and Range orogeny continues to the present, as evidenced by historic fault-based earthquakes (Stewart and McKee 1977).

The down-faulted blocks are buried under the debris washed into the valleys by erosion of the uplifted blocks. The block faulting has continued into historic time, and in many valleys the alluvial gravel fans and other fill are faulted along with bedrock. Structural deformation continues to the present as evidenced by: (1) numerous earthquake epicenters in the region; (2) numerous Holocene epoch (10,000 years b.p. to present) fault scarps and warped or faulted ancient lake shorelines; and (3) measured displacement of benchmarks and measurements by tiltmeters (Hunt 1967). These deformations are more active to the west and east of the Central Area but are present within the study area. One of the most distinguishing characteristics of the region's faulting is that the normal faulting is antithetic (i.e., the faults dip opposite to the direction in which the rock strata dip) (Thornbury 1965). As a result, the same stratigraphic units along a profile across the ranges may repeat themselves several times. The faulting, which largely came as a late event in the region's geologic history, was imposed upon rocks that already had been subjected to considerable earlier deformation (folding, faulting), erosion, and episodes of stratigraphic generation. High-angle normal faults are most characteristic of the region; however, low angle thrust faults also are present. While fault scarps form the front of many fault blocks in the region, fault-line scarps also are characteristic. Additionally, range-marginal scarps may exist without being expressed topographically by scarps (Thornbury, 1965). In sum, each mountain range must be interpreted based on its own geologic, structural and geomorphic history.

Faulting and tilting of the block mountains have created internal drainage; in some areas, there is no drainage outlet for the rivers. The fault block system was sufficiently formed in the Pleistocene that in some of the basin areas, large lakes formed that persisted for thousands of years, coincident with the formation of Lake Bonneville to the east and Lake Lahontan to the west (Flint 1970). Although none of the lakes in the region reached the size of those two lakes, many in the study area were of large size and

depth. With climatic change to a warmer cycle, the lakes evaporated, leaving evidence of their presence by stratified lake sediments with fossil assemblages (e.g., fresh water mollusks) and remnant geomorphological features of the ancient shorelines (e.g., wave cut cusps and benches). The more humid conditions of the Pleistocene Epoch resulted in significant erosion of the mountains and the deposition of eroded debris in the adjacent valleys. The valleys were filled to great depth with sediment, and large alluvial fans formed at the foot of each mountain range.

The onset of arid conditions at the close of the Pleistocene changed the nature of geomorphologic processes shaping the land. While faulting and volcanic episodes continued, erosion of the mountain ranges was accomplished through continued sediment transport from the higher elevations, with extensive deposition at the base of the mountains. The result seen today is the formation of steep slopes in the mountains with extensive bedrock exposures and thin soils, while extensive gently sloping alluvial fans formed and coalesced to form almost continuous alluvial aprons at the base of each range (see discussion of stream processes in Chapter 3.3, Hydrology and Water Resources). In some areas, the alluvial fans have been formed over the lower portions of the pediment slopes at the foot of the mountains. The alluvial and pediment slopes have merged to form a continuous slope that drops gently down to the valley bottom. In other areas, where uplift was particularly strong and continuous, no pediment slope was formed and the alluvial fans form deep deposits, which also are expressed in the topography as long, gentle slopes dropping to the valley floor. A variety of characteristic landforms are present, including mountain valley fans, piedmont fans, alluvial plains, ballenas, and fan skirts (Peterson 1981). The resulting characteristic topography as expressed in the current landscape is comprised of a broad, flat basin plain, typically formed by fine-grained sediment and having closed drainage. The flat basin plain gives way to a broad, gently inclined, alluvial apron comprised of stratified coarse sediments leading up to the mountain front. In general, the alluvial veneer thins as the mountain front is approached, except in the areas of mountain canyon mouths. At the mountain front there is an abrupt steepening of slope where harder geologic materials (rock with a thin soil veneer) form the surface. The mountains are characterized by steep slopes and deeply eroded surfaces.

Concurrent with the Basin and Range Orogeny block faulting, there were extensive eruptions of lavas and volcanic tuffs in the southwest part of the Central Area (Hunt 1967; Stewart and McKee 1977; Hose and Blake 1976). Tertiary volcanic rocks (e.g., basalts, lavas, tuffs, rhyolites, and other rocks) crop out at places throughout the study area.

GEOLOGIC MATERIALS IN THE PROJECT AREA

Geologic materials in the study area (within approximately 4 miles of the route alternatives) vary greatly in composition, texture, age, and structure. The rocks and sediments are described in summary fashion below from youngest (Cenozoic Era) to oldest (Paleozoic Era). Tables are presented in the impact analysis that identify the geologic materials encountered along each segment route. The geologic unit identifier on geologic maps are specified in parentheses in the following discussion. Refer to the cited reports for detailed information about the geologic materials.

Cenozoic Era (6.5 million years ago to present)

Quaternary Period (approximately 2 million years ago to the present) rocks and deposits comprise the most widespread geologic materials in the project area. Most of the proposed transmission line would be located in valley areas comprised of various Quaternary sediments, chiefly alluvium. Most of these sediments are unconsolidated at the surface. A few areas along segments cross volcanic rocks dating to the Quaternary.

Quaternary sedimentary rocks and materials (Qs)
This grouping is a general classification of sediments and rocks deposited in the Quaternary (Hose and Blake 1976). These materials are predominantly stream-laid deposits ranging from clays and silts to coarse boulders and cobbles. The sediments were laid by depositional processes and are generally stratified. Quaternary alluvium is a general category that encompasses the types of deposits distinguished by type and age in some geologic reports in the area, as described below. This category also includes calcareous and siliceous sinter deposits from hot springs.

Quaternary alluvium (Qal)
Sediments in this grouping are stream-laid deposits ranging from clays and silts to coarse boulders and cobbles. The deposits were derived by weathering and erosion of the mountains, transported by streams, and laid by depositional processes in the valleys. Quaternary alluvium is a general category that encompasses the types of deposits that are distinguished by type and age in some geologic reports in the area, as described below.

Quaternary alluvial fan deposits (Qf)
These sediments are comprised of stream-laid deposits ranging from clays and silts to coarse boulders and cobbles, but mostly comprised of gravel and sand. They are distinguished from other alluvium based on their depositional environment at the bases of mountain ranges in fan formations. The materials are generally poorly sorted. (Roberts et al. 1967) They are not further distinguished by age group in this designation.

Quaternary playa deposits/ pluvial lake deposits (Qp)
These sediments consist of clay and fine silts that were deposited in dry lakes (playas). They are stratified, unconsolidated deposits and contain local lenses of sand and gravel (Roberts et al. 1967). Pluvial lake deposits are similar in character to playa deposits but date to earlier episodes of wetter climate during the Pleistocene Epoch.

Quaternary valley alluvium (Qa)
Sediments in this grouping are stream-laid deposits ranging from clays and silts to coarse boulders and cobbles. The alluvium was laid by depositional processes and is stratified. Quaternary valley alluvium is generally associated with younger age deposits (i.e., Holocene [about 10,000 years b.p. to present] and Pleistocene [about 2 million – 10,000 years b.p.] epochs).

Quaternary older fan deposits (Qoa)
These sediments are comprised of stream-laid deposits, as described above. They are distinguished by greater age in this designation than the Holocene (Recent) fans, typically dating to the Pleistocene Epoch. Some geologists, however, believe that some of the older sediments may date to the Tertiary Period (pre-Pleistocene Epoch) (Stewart and McKee 1977). The sediments are commonly dissected.

Quaternary sedimentary deposits undivided (QTsu)
This grouping encompasses a general category of sedimentary deposits that date to the late Tertiary to early Quaternary Periods (Roberts et al. 1967). The deposits are similar to the Quaternary sedimentary rocks and materials described previously.

Quaternary volcanic rocks undivided (QTvu)
This grouping encompasses a general category of volcanic rocks that date to the late Tertiary to early Quaternary Periods. The deposits are varied volcanic rocks and include andesite and basalt flows (Roberts et al. 1967).

Tertiary volcanic rock undivided (Tvu)
A variety of Tertiary volcanic rocks are present in the study area. These include basalt and basaltic andesite flows, diabase (doloritic) dikes, tuffs, conglomeritic tuffs, volcanic breccia, rhyolite flows, quartz latite, and other volcanic extrusive rocks (Roberts et al. 1967).

Tertiary gravels (Tg)
These deposits consist of poorly sorted gravels comprised of pebbles and boulders (Roberts et al. 1967) in the Cortez and Simpson Park Mountains in Eureka County. They are overlain by basaltic andesite lava flows.

Tertiary sedimentary and volcanic rocks (Tys)
These deposits consist of younger (20 – 21 million years old) inter-bedded sedimentary rocks of well-bedded light-gray, fissile, calcareous siltstone, fine-grained calcareous sandstone, and conglomerate. The sediments are in part tuffaceous and associated with ash flows. The siltstone contains a high proportion of vitric ash and air-fall tuff, much of it cemented with calcite. The unit contains some fossils locally (Hose and Blake 1976).

Tertiary younger ash flow tuffs (Tyt)
These are welded tuff ash-flow deposits. The volcanic deposits generally lack megascopic crystals (Hose and Blake 1976).

Miocene basaltic andesite (Tba)
These are volcanic deposits that range from reddish-gray, platy, flow-banded to massive, slightly vesicular, dark-gray rock. The rocks are about 15 million years old (Stewart and McKee 1977).

Tertiary older volcanic rocks (Tov)
These volcanic deposits consist of rhyodacite, quartz latite, andesite, thin inter-beds of air-fall tuff, and related sedimentary rock and welded tuff. These Oligocene volcanic deposits are dated at 25 million to 32 million years old (Hose and Blake 1976).

Caetano tuff (Tc)
The Caetano tuff is an Oligocene, very thick (500 – 8,000 feet) composite ash-flow sheet with inter-beds of sedimentary rock. The principal rock in the formation is gray to purplish crystal-rich welded tuff (Stewart and McKee 1977).

Mesozoic Era (195 million – 65 million years b.p.)

The Cretaceous Period (approximately 136 million to 65 million years b.p.) and the Jurassic Period (approximately 195 million to 136 million years b.p.) are represented by several rock formations that crop out in the immediate transmission corridor study area.

Newark Canyon Formation (Kn)
This is a Cretaceous sedimentary deposit formed in freshwater. Silt, shale, sandstone, and grit predominate, but conglomerate and light- to medium-gray freshwater limestone are also present. Locally, the formation contains conglomerate limestone beds. The rock is carbonaceous and dark in color, but locally is reddish and brown. It is fossiliferous (Roberts et al. 1967).

Intrusive rock (ir)
This group of igneous intrusive rocks ranges in age from the Jurassic to the Tertiary, but most are considered early Cretaceous to early Tertiary. They consist primarily of quartz monzonite and granodiorite, with lesser quartz diorite and alaskite (Roberts et al. 1967).

Volcanic rocks (KJv)
These thick (3,500 – 10,000 feet) extrusive rock formations date to the Jurassic or Cretaceous. They consist of a volcanic medium-grained, light-brown, and thin-bedded wacke member; a middle ash-flow tuff member comprised predominantly of white silicic ash-flow tuff and subordinate green ash-flow tuff with current-bedded sandstone; and an upper member comprised of maroon and black rhyolite and rhyodacite flows, and subordinate green and white flow-breccias. The upper member contains iron deposits. Welded tuffs and andesitic lava-flows are present in some areas. The formation may contain Permian porphyritic quartz latite rocks exposed in the Dry Hills (Roberts et al. 1967).

Paleozoic Era (570 million – 225 million years b.p.)

Paleozoic Era rocks crop out in mountain ranges crossed by the project. The ancient rocks date to the Permian Period (280 million – 225 million years b.p.), Pennsylvanian Period (320 million – 280 million years b.p.), Mississippian Period (345 million – 320 million years b.p.), the Devonian Period (395 million – 345 million years b.p.), Silurian Period (440 million – 395 million years b.p.), and Ordovician Period (500 million – 440 million years b.p.). Ordovician rocks are the oldest rocks encountered along the routes of proposed transmission segments. The rock formations are described below.

Arcturus (Pa) and Rib Hill (Pr) Formations (or Par)
The Permian Arcturus Formation consists of limestone with lenticular beds of sandstone. The lower part consists mainly of massive light-olive gray to cream-colored resistant limestone, much of which is sandy or silty. The upper part is very fine-grained, yellowish-gray calcareous sandstone and siltstone. It contains gypsum and is fossiliferous (Hose and Blake 1976). The Rib Hill Formation is a Permian sandstone and lays below the Arcturus Formation. It mostly consists of very fine-grained to medium-grained yellowish calcareous sandstone. The rock erodes to form gentle, even slopes. It contains thin inter-beds of medium-light-gray dolomite and sandy to silty limestone that erodes to form narrow ledges. It is fossiliferous. The Rib Hill sandstone lays over the Riepe Spring limestone (Hose and Blake 1976).

Garden Valley Formation (Pg)
This Permian formation (also called Unit G in the Diamond Range) consists of four members: a limestone made up of sandy limestone and calcareous sandstone and local chert pebble conglomerate layers and cherty limestone beds form the basal unit. The basal unit is overlain by a siliceous cobble and boulder conglomerate, sandy carbonaceous shale, and carbonaceous sandstone. The third member is a reddish-brown siliceous conglomerate with quartzite and chert cobbles cemented by silica. That member is highly resistant and forms prominent ridges. The upper member consists of purple and red shales and conglomerates (Roberts et al. 1967).

Riepe Spring limestone and Pilot shale (PP)
The Pennsylvanian Riepe Spring limestone of Steele is a medium gray limestone similar to the Ely limestone; until 1960, it was included as part of that system. The rock weathers to a medium-gray to olive-gray color. The rock has a coarsely crystalline to granular texture. Eroded outcrops of the Riepe Spring system form characteristic alternating ledges or cliffs with intermediate gentle slopes. The slope-forming component is comprised of platy medium-gray to yellowish-gray silty limestone. The limestone contains abundant nodules, concretions, lenses, and bands of chert, and locally contains conglomerate. It is comprised of marine fauna and flora and is fossiliferous. It overlies and is gradational to the Diamond Peak Formation (Hose and Blake 1976). The Mississippian Pilot shale is described below.

Pennsylvanian/Mississippian Diamond Peak and Chainman Formations (PMdc)
See below.

Diamond Peak Formation (Md)
Rocks in this Mississippian formation vary somewhat, depending on locality. In some areas, it is predominantly olive-gray siltstone and silty claystone with some sandstone and minor conglomerate. In other areas, the sandstone and conglomerate components are substantial. The sandstone is cross-bedded and platy and ranges from very fine- to very coarse-grained. The conglomerate contains pebbles and cobbles consisting mainly of quartzite and chert. It weathers grayish-yellow, moderate yellowish-orange, and brick-red. It contains diverse marine fossils, most of which are Mississippian; however, the upper parts of the formation may have Pennsylvanian Age fossils (Roberts et al. 1967). The Diamond Peak Formation lies over the Chainman shale (see below) (Hose and Blake 1976).

Mississippian sedimentary rocks undivided (Mu)
These formations are comprised of varied sedimentary strata including the Chainman and Diamond Peak Formations, Joana limestone, an unnamed conglomerate, and the Tonka Formation of Dott, which consists of chert-pebble conglomerates with quartzite and shale inter-beds (Roberts et al. 1967).

Chainman shale, Joana limestone, and Pilot shale (MD)
These comprise a Devonian-Mississippian system. The Chainman shale is the uppermost unit in the sequence. The shale is uniform in lithology and consists of very dark-gray to black shale and olive-gray platy siltstone or silty shale. It is comprised of soft, incompetent rocks, and is infrequently exposed (Hose and Blake 1976).

The Joana limestone (present in the Eureka district of the Diamond Mountains) is a dense porcelaneous limestone that is coarsely crystalline and contains nodular, cherty limestone. It is a massive medium-gray to medium-light-gray limestone that forms generally resistant, somewhat rounded ledges or cliffs (Hose and Blake 1976). It is locally fossiliferous (crinoids). In places it contains shale like the underlying Pilot shale. It is early Mississippian (Roberts et al. 1967). The Pilot shale (present in the Eureka district of the Diamond Mountains) is a platy, calcareous shale, dun-colored to black on fresh surfaces and weathers to pinkish or light yellowish-brown or gray. The lower part contains much thin-bedded shaly limestone, and the upper part is chiefly shale. It overlies the Devonian Devil's Gate Formation (see below). It is locally fossiliferous (Roberts et al. 1967).

Devonian limestone (Dl)
This formation is comprised of a thick-bedded to massive, dark-gray limestone with subordinate yellow-gray-weathering, slabby, silty limestone. In some places, the massive limestone is cliff-forming. In some areas, it is thin-bedded with some shale. It is fossiliferous (Stewart and McKee 1977).

Slaven chert (Ds)
This Devonian formation consists predominantly of very thin- to thin-bedded black chert in sequences many hundreds of feet thick. Locally thin beds of limy brown-weathering sandstone, feldspathic siltstone, and limestone are present in the formation. It is fossiliferous.(Stewart and McKee 1977).

Devonian sedimentary rocks undivided (Dwu or Deu)
These contemporaneous formations are distinguished by a western assemblage of siliceous rocks (Dwu) and an eastern assemblage of carbonate rocks (Deu) that includes the Wenban limestone (a thick sequence of both thick-bedded argillaceous limestone and bioclastic limestone) and Pilot shale in the Cortez area (Roberts et al. 1967).

Guilmette Formation (Dg)
The Devonian Guilmette Formation is an even-bedded, dark-gray to grayish black, sublithographic limestone that weathers to olive-gray to medium-light-gray. It is locally cut by small veins of white calcite. It is similar in character and age to the Devil's Gate Formation and correlates in age with the Nevada Formation (see below). It is fossiliferous (Hose and Blake 1976).

Devil's Gate limestone (Dd)
These rocks are calcareous gray to blue-gray limestones that are mostly thickly bedded. The limestones are middle to late Devonian and typically overlay the Nevada Formation and are gradational to it (Roberts et al. 1967).

Nevada Formation (Dn)
The Nevada Formation designates an early to middle Devonian sequence that ranges from dolomite to limestone, and shaly limestone (Roberts et al. 1967).

Devonian, Silurian, and Ordovician Valmy, Vanini, Nohm, and Valder Formations (DOs)
This grouping of formations includes mudstone, shale, chert, siltstone, gray quartzite, greenstone, and minor limestone (Coats 1987). Valmy and Vanini formations are described below. The Valder Formation consists of middle to lower Ordovician shale and volcanic rocks. The Noh Formation is of Silurian age and consists of dark-gray chert and light-gray shale in a basal unit; a middle unit of light-brown-weathering siliceous shale and siltstone; and an upper unit of tan-and light-brown weathering, thin-bedded siltstone, sandstone, and minor shale (Coats 1987).

Devonian Sevy, Simonson, and Nevada Formations (Dn, Dd)
These formations are sometimes combined. The Sevy dolomite is a very fine-textured dolomite with a medium-gray color that weathers to light-gray to yellowish-gray. In places, it contains layers of very fine-textured darker dolomite and becomes somewhat coarser toward its lower part. It contains few fossils. The Simonson dolomite varies according to sub-units. The oldest unit consists of sugary-textured pale-yellowish-brown dolomite that weathers to pale-brown to light-olive-gray. This member is friable and where eroded forms rounded ledges. The next higher member contains beds of light-colored dolomite, alternating with beds of coarser medium-dark-gray dolomite that weathers to olive-gray. The darker beds are strikingly laminated. The next higher member consists of finely crystalline, dark to medium-gray dolomite that weathers olive-gray to pale-yellowish-brown. It is more resistant than the members above and below it and forms brown cliffs. It has abundant fossils. The highest member of the Simonson is also a dense, light-colored dolomite that contains lenses of fine-grained medium-gray limestone. The Simonson lies over the Sevy dolomite, but is gradational in character to it (Hose and Blake 1976). The Nevada Formation is described above.

Vanini Formation (Ov)
This Ordovician formation consists of quartzite, gray sandy limestone, sandy siltstone, chert, clay shale, organic shale, and some andesitic volcanic rock types. Shale and siltstone are especially common in the area. Toward the west, the formation merges indistinguishably with rocks referred to as the Valmy Formation (Stewart and McKee 1977).

Valmy Formation (Ova)
The Ordovician Valmy Formation consists mostly of chert, quartzite (or sandstone), and siltstone, argillite, or shale. The quartzite commonly occurs in massive units. Color varies from light-gray, dark-gray, green, or red. Greenstone occurs as pillow lavas to ash in some areas (Stewart and McKee 1977).

Ordovician Lower Part Pogonip Group and Eureka Quartzite (Ol)
The Eureka quartzite is a distinctive, dense, milky white to cream-colored, sugary to vitreous quartzite that forms bold outcrops and prominent cliffs and escarpments. It is comprised of well-sorted fine to medium quartz grains (Roberts et al. 1967). The Pogonip Group lies below the Eureka quartzite. The Pogonip Group consists mainly of platy- to thin-bedded, fine- to coarse-textured, medium-gray to medium-light-gray detrital limestone. It is inter-bedded in many places with flat-pebble conglomerate locally containing quartz. Much of the limestone is silty with dark-yellowish-orange nodules. Shale

occurs in the upper part of the Pogonip Group. The Pogonip generally forms a slope interrupted by ledges of resistant rock. The Pogonip dates to the lower Ordovician (Hose and Blake 1976).

SEISMICITY

The entire study area is located in an area in which seismic and volcanic forces are active, as evidenced by historic earthquakes and hot springs (see Figure 3.1-1). The fault block structures of the region are complex. Each mountain range is formed by uplift along a fault system, forming tilt blocks or up-thrown blocks (the latter are referred to as horst structures), and many valleys have been formed by down-dropping along bordering faults (referred to as graben structures). The alluvium that fills these valleys obscures the great extent of uplift and down-dropping along fault systems in the region. Many of the larger fault systems have been mapped in the region. Records of earthquake epicenters are available; however, data on slip rates and activity levels for most faults have not been developed. The major fault systems in the study area crossed by the study corridor segments include the following: Boulder Valley, east side of the Shoshone Range, west side of Cortez Range, east side of Whirlwind Valley, east side of Garden Valley, northwest side of Roberts Mountains, east and west sides of the Diamond Mountains, west side of Pinyon Range, east side of Newark Valley, east side of Butte Mountains, and southeast side of the Egan Range. Structures within an active fault zone have a risk of damage from rupture of the fault and the resultant ground displacement, as well as high intensity ground shaking.

The Uniform Building Code generally interprets the composite seismic risk of the study region as Zone 2 in the eastern part and Zone 3 in the western part. Zone 2 would be expected to have moderate damage to structures during major earthquakes, and the damages equate approximately to Intensity VII of the Modified Mercalli Scale. Intensity VII is generally equated with an average peak velocity of 8 – 12 centimeters per second and average peak ground gravitational acceleration of 0.10g to 0.15g (g is gravitation acceleration). That intensity is interpreted as an earthquake of sufficient size that expected damage would be negligible in structures of good design and construction, slight to moderate in well-built ordinary structures, and considerable in poorly built or badly designed structures (Bolt 1988). Zone 3 is expected to experience major structural damage, and Modified Mercalli Intensity is rated as VIII or higher. Intensity VIII is generally equated with an average peak acceleration of 20 to 30 centimeters per second and an average peak ground acceleration of 0.25g to 0.30g. This intensity is interpreted as resulting in slight damage in specially designed structures, considerable in ordinary substantial buildings, with partial collapse and great in poorly built structures. Additionally, this level of intensity would be expected to result in fall of columns, monuments, and walls (Bolt 1988).

The secondary hazards of earthquakes include liquefaction, rapid ground settlement, and induced landslides and rockfalls. Liquefaction is the rapid transformation of loose saturated sand to a fluid-like state because of ground shaking during an earthquake. The rapid loss of pore pressure in the sand causes it to lose its strength (inter-granular friction), with the result that the soils loses its bearing capacity and may spread laterally. The hazard would be restricted to alluvial materials that are saturated. Given the aridity of the region, liquefaction is likely to be a hazard only in valley bottoms where groundwater saturates sandy soil. Alluvial materials also may densify because of ground shaking with the result that rapid settlement of the soil occurs. In the areas within or near mountain ranges, ground shaking also may dislodge landslides and rocks.

Sierra Pacific Power Co.

FALCON to GONDER Project

Fault Systems

Types of Faults

- Concealed fault
- Concealed thrust fault
- Inferred fault
- Inferred thrust fault
- Known fault
- Known thrust fault
- Fault scarp
- Generalized Major Fault

Other Land Status

- US National Forest
- BLM Wilderness Study Area
- BLM District Boundary
- Route Alternatives
- Existing Transmission Line

Scale 1 : 760,320

Kilometers 5 0 5 10 15 20 25 30

Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by EDAW, Inc. – San Francisco 4/25/01

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Sources: Nevada Bureau of Mines & Geology GIS / BLM / Stantec / EDAW

Figure 3.1 - 1

SLOPE

Slope is an important indicator of constraints related to engineering requirements, erosion hazard, and potential slope instability. For purposes of mapping, slopes are classified into four groups: flat (under 1% slope); gently sloping (1 to 5%); moderately sloping (5 to 15%), and steeply sloping (greater than 15%). While the region is occupied by numerous mountain ranges with steep slopes, most of the land area is occupied by the broad, long valley areas characterized by gentle slope. The broad valley floors, including playa (dry lake) surfaces, are predominantly flat slopes. The alluvial fan and pediment slopes are predominantly flat in the lower-lying areas where they merge into the valley bottoms, and increase in slope toward the mountain front. Most of the alluvial fan slopes are gently sloping features. Local erosion channels in the fans may have moderately and steeply sloping channels. Typically, the mountain front of a range is characterized by a relatively abrupt change in slope. Mountain slopes of the mountains are moderate to steep. Narrow valley floors in the mountains have gentle to steep gradients, with a wide range in slope being characteristic.

MINERAL, OIL, GAS, AND GEOTHERMAL RESOURCES

The study area encompasses a major mineral resource area, and mining operations are scattered throughout the project area. Metals produced commercially in the region include antimony, copper, gold (lode and placer), iron, lead, manganese, mercury, molybdenum, platinum, rhenium, silver, tungsten (lode and placer), and zinc. Gold, silver, and copper are mined heavily and are the most economically valuable mined resource. Commercially mined non-metals include barite, coal, fire clay, fluorspar, garnet, lime, magnesite, phosphate, sand and gravel, siliceous flux, stone (dimension and crushed), and turquoise. The Cortez gold mine is the largest mining operation in the study area. It is an open pit gold mine, and its operating company has expansion plans for the mine that could conflict with the proposed transmission line centerline on Segment B (BLM 1999).

The Ruby Hill gold mine project (BLM 1997) and the expansion of the Bald Mountain mining project (BLM 1995) also are near potential transmission line segments, but not close enough to directly conflict. Commodities with the potential for development include beryllium, bismuth, nickel, selenium, and tellurium and non-metals (deweylite, gypsum, hallosyte, perlite, petroleum, and potash) (Smith 1976). These resources are largely relegated to the mountainous areas. The broad alluvial plains have relatively few minerals of economic value. Aggregate (sand and gravel) is mined in areas with alluvial fans and aprons. Aggregate is a common resource in the region and has widespread distribution. Numerous aggregate quarries and borrow pits are scattered throughout the study area.

Segments of the proposed project route alternatives cross seven designated mining districts: Beowawe, Cortez, Pine Valley, Mount Hope, Eureka, Bald Mountain, and Illipah. Additionally, the segments pass within 10 linear miles of the following mining districts: Argenta, Alpha, Antelope (Eureka), Bateman Canyon, Buckhorn, Bullion, Carlin, Chase, Diamond Marsh, Duck Creek, Huntington Creek-White Pine, Lone Mountain (Eureka), Mineral Hill, Modarelli-Frenchie Creek, Newark, Pancake, Pinto, Railroad, Robinson, Robinson Mountain, Safford, San Francisco, and Union (Eureka-Elko). Both shaft and open pit mines are present.

Within the mining districts are many active mining claims. An active claim is a pre-existing, legal right to explore for mineral resources. Renewal of the claim requires some site development activity, and the renewal must be filed annually with the BLM and the counties in which they are located. There are approximately 122 active mining claims in the study area, of which approximately 70 active claims are within or near the study corridor (Hirschman 2000). Active claims provide the legal right to explore for minerals, but do not necessarily indicate the existence of active commercial mining operations.

The area also has oil and natural gas resources. Exploration began in the 1920s and development was initiated in the 1950s in the Egan Resource area of the BLM Ely District (BLM 1992). Major oil

companies have explored the area for potential resource development. A notable concentration of oil development is located in Pine Valley in Eureka County; however, oil development is scattered throughout the region.

Geothermal resources are present locally, but the nature of geothermal energy in the region has not led to its widespread development for energy or other notable uses. Geothermal resources have been developed in the Beowawe area (The Geysers) for energy generation and at scattered sites in Crescent Valley at the southerly end of the Dry Hills, along the eastern side of the Sulphur Springs Range and near Buck Mountain. Local hot springs have obtained value primarily for their interest to tourism and their unique habitat values.

Table 3.1-1 provides a summary of the elevation, topography, geology and hazards in the study area.

TABLE 3.1-1: ELEVATION, TOPOGRAPHY, GEOLOGY, AND HAZARDS

Milepost	Elevation (meters)	Topography	Geology	Hazards	Features within ½ mile	Features within 10 miles
Segment A						
0 – 8.5	1418 –1450	Flat floodplain, Humboldt River floodplain	Quaternary alluvium (Qal)	Crossing of a major fault zone at about MP 6.6	Parallels existing TL	
8.5 – 16.7	1450 – 1500	Gently sloping alluvial apron	Quaternary alluvium (Qoa); Tertiary volcanic rock (Tvu)		Parallels existing TL	Gravel pits w/in 3 miles; Beowawe Mining District w/in 1 mi. and Argenta Mining District w/in 6 mi.; scattered geothermal wells in Boulder Valley
Segment B						
0 – 5.0	1450 – 1575	Gently sloping alluvial apron	Quaternary alluvial fan deposits (Qf)		Hot springs near alignment; ca. ½ mile from The Geysers; geothermal plant; Beowawe Mining District; ATR Ginn No. 1-13 oil well on TL alignment	At edge of Beowawe Mining District: Argenta Mining District w/in ½ mi.
5 – 9.5	1560 – 1740	Low hills (Malpais Hills)	Miocene basaltic andesite (Tba)	Crossing of major fault zone near MP 9		Abandoned Bante Mine w/in 5 miles and open pit mines in Slaven Canyon w/in 3 miles Argenta Mining District w/in 1 mi.; Bateman Canyon Mining District w/in 3 mi.
9.5 – 32.0	1450 – 1600	Gently sloping to flat valley floor (Crescent Valley)	Quaternary alluvial fan deposits (Qf) and Quaternary Valley alluvium (Qa)		Mud Spring Mine adjacent to TL and staging area; Large open pit Cortez Gold Mine, mine dump and tailings ponds w/in ½ mile of TL	Numerous large open pit mines in Rosebud Gulch, Spring Gulch, Mill/Triplet Gulch and Hot Springs Point w/in 4 – 5 miles of TL; Bullion Mining District w/in 3 mi.; geothermal wells in Crescent Valley at southern end of Dry Hills at western edge of Cortez Mountains
32.0 – 37.7	1550 – 1850	Steep hills and canyons (Cortez Mountains/Toiyabe Range); gently sloping fan slopes of upper Grass Valley	Devonian limestone (Dl), Devonian chert (Ds); Quaternary fan deposits (Qf)	Crossing of fault zone and scarp at foot of Cortez Range near MP 32-33; slope instability; erosion		Open pit mine north of Cortez Canyon, in Mill Canyon, Mount Tenabo and Copper Canyon; many prospects within 1 – 5 miles of TL; passes through Cortez Mining District; Buckhorn Mining District w/in 6 mi.;

TABLE 3.1-1: ELEVATION, TOPOGRAPHY, GEOLOGY, AND HAZARDS (CONT.)

Milepost	Elevation (meters)	Topography	Geology	Hazards	Features within ½ mile	Features within 10 miles
37.7 – 41.0	1740 – 1930	Gently sloping fan slopes	Quaternary fan deposits (Qf) or Quaternary older fan deposits (Qoa)		w/in ½ mile of springs	w/in 1 – 4 miles of several gravel pits and prospects in the southern end of the Cortez Mountains; w/in Cortez Mining District
41.0 – 44.0	1850 – 2000	Dissected hills	Ordovician Vinini Formation (Ov); Tertiary gravels	Crossing of major fault zone near MP 41	Prospects w/in ½ mile	w/in 1.5 mile of gravel pit; w/in Cortez Mining District; w/in 6 mi. of Buckhorn Mining District
44.0 – 61.8	1700 – 1850	Alluvial fans and flat valley bottom	Quaternary Older fan deposits (Qoa); Quaternary sedimentary deposits undivided (Qtsu); Quaternary alluvium (Qal)	Crossing of major fault zone near MP 54	w/in ½ mi of two oil wells	w/in 1 – 4 miles of gravel pits, an open pit mine, numerous prospects; w/in 5 mi. of Alpha Mining District and 7 mi. of Antelope (Eureka) Mining District
Segment C						
0 – 2.0	1450 – 1500	Gently sloping alluvial apron and flat valley bottom (Whirlwind Valley)	Quaternary alluvium (Qoa) and older alluvium (Qoa)		Hot springs near alignment; ca. ½ mile from The Geysers; geothermal plant; Beowawe Mining District	w/in Beowawe Mining District; gravel pit w/in 1 mi.; w/in 4 mi. of Argenta Mining District
2.0 – 3.5	1500 – 1650	Steeply dissected hills (Malpais Hills and moderately sloping alluvial apron/pediment	Ordovician Valmy Frm. (Ova) and Tertiary volcanic rocks undivided (Tvu)	Crossing of a major fault zone near MP 2		w/in Beowawe Mining District; gravel pit w/in 1 mi.; scattered prospects w/in 1 mi.
3.5 – 12.0	1400 – 1600	Gently sloping alluvial slopes and flat valley bottom (Crescent Valley)	Quaternary older alluvium (Qoa), Quaternary playa deposits (Qp), and Quaternary alluvium (Qal)	Crossing of a major fault zone at MP 11.5		Gravel pit and scattered prospects w/in 1 mi.; geothermal wells at Beowawe and to south in Crescent Valley at southern edge of Dry Hills
12.0 – 16.5	1550 – 1900	Steep to moderately sloping hills (Dry Hills)	Jurassic/Cretaceous volcanic rocks and Permian porphyritic rocks KJv)	Erosion		Mine w/in 1 ½ mi. and scattered prospects w/in 1 - 2 mi.
16.5 – 20.7	1600 - 1850	Gently sloping alluvial fans and flat valley bottom (Crescent Valley east arm [Thomas Creek])	Quaternary older alluvium (Qoa)			Scattered prospects w/in 2 – 4 mi.; w/in 4 mi. of Safford Mining District and 7 mi. of Modarelli-Frenchie Creek Mining District
20.7 – 24.0	1650 - 2025	Moderately to steeply sloping dissected hills (Cortez Mountains)	Jurassic/Cretaceous volcanic rocks (KJv); Cretaceous Newark Canyon Frm. (Kn), and minor Tertiary volcanic rocks undivided (Tvu)	Crossing of a major fault zone at MP 21.5; erosion		w/in 4 mi. of Railroad Mining District, 9 mi. of Carlin Mining District
24.0 – 35.7	1625 - 1650	Low to moderate slopes with short segments of steep slope formed on dissected alluvial fan/pediment forming west side of Pine Valley	Tertiary sedimentary deposits, undivided (QTsu) interspersed w/ Quaternary alluvium (Qal)	Erosion	w/in ½ mi. of oil well	w/in 1½ mi. of Pine Valley Mining District near junction w/ Alignment E, w/in 5 mi. of Robinson Mountain Mining District and 6 mi. of Larrabee Mining District; Pine Valley Oil Field; geothermal wells in Pine Creek Valley

TABLE 3.1-1: ELEVATION, TOPOGRAPHY, GEOLOGY, AND HAZARDS (CONT.)

Milepost	Elevation (meters)	Topography	Geology	Hazards	Features within ½ mile	Features within 10 miles
Segment D						
0 – 13.0	1625 – 1725	Gently sloping alluvial fan and valley bottom (Pine Valley)	Tertiary sedimentary deposits, undivided (QTsu) and Quaternary alluvium (Qal)		w/in ½ mi. of three oil wells of the Pine Valley Oil Field	w/in 1 mi. of Pine Valley Mining District; w/in 5 mi. of Mineral Hill Mining District, 6 MI OF Modarelli-Frenchie Creek, 8 mi. of Buckhorn, and 8 mi. of Union (Eureka-Elko) Mining District; w/in ½ mi. of 2 gravel pits; many oil wells of Pine Valley Oil Field
13.0 – 19.5	1675 – 1775	Gently sloping alluvial fan and valley bottom (Garden Valley)	Quaternary older alluvium (Qoa)	Crossing of major fault zone near MP 16-17		w/in ½ mi. of 2 gravel pits; w/in 5 mi. of Alpha Mining District and 6 mi. of Antelope (Eureka) Mining District
Segment E						
0 – 1.5	1575 – 1600	Flat valley bottom of Pine Creek and gently sloping alluvial fan slopes	Quaternary alluvium (Qal) and Tertiary sedimentary deposits, undivided (QTsu)	Expansive soils	Crosses through Pine Valley Mining District; w/in ¼ mi. of mines and numerous prospects	Prospects w/in 4 mi.; w/in 6 mi. of Modarelli-Frenchie Creek Mining District; many wells of Pine Valley Oil Field
1.5 – 6.0	1600 – 1800	Flat to gently sloping valley floor and alluvial fan slopes Sulphur Spring Range	Quaternary alluvium (Qal) and Tertiary sedimentary deposits, undivided (QTsu), and Quaternary older alluvium (Qoa)		Crosses through Pine Valley Mining District; w/in ¼ mi. of mines and numerous prospects; w/in ½ mi. of oil well in Pine Valley Oil Field	w/in 1 – 4 mi. of scattered prospects; many wells of Pine Valley Oil Field
6.0 – 12.5	1800 – 1950	Steep to moderately sloping mountain slopes (Sulphur Springs and Pinyon Range, Black Mountain)	Devonian sedimentary rocks, undivided (Dwu); Devonian Sevy, Simonson, Nevada Frms (Dn, Dd); Pennsylvanian/Miss issippian Diamond Peak and Chainman Frm. (PMdc); Devonian, Silurian and Ordovician Valmy, Vanini and Valder Frms.) DOs, and Quaternary alluvium (Qa)	Crossing of a major fault zones near MP 6; erosion, slope stability		w/in 2 mi. of Larrabee Mining District; 3 mi. Union-(Eureka-Elko) Mining District; 5 mi. Robinson Mountain Mining District, 6 mi. of Mineral Hill Mining District; w/in 1 mi. of scattered prospects; geothermal wells in Pine Valley
12.5 – 22.0	1775 – 1950	Mostly gently sloping alluvial fan slopes (Garcia Flat[Diamond Valley]); local moderate slope	Quaternary alluvium (Qa, Qal); Quaternary pluvial lake deposits (Qp); Quaternary older alluvium (Qoa)		w/in ½ mi. of oil well at Garcia Flat	w/in 2 mi. of scattered prospects; w/in 6 mi. of Diamond Marsh Mining District; scattered oil wells in Huntington Valley
22.0 – 24.0	1825 – 1875	Gentle to moderate hill slopes on flank of Diamond Mountains	Mississippian Diamond Peak Frm. (Md)	Fault crossing		
24.0 – 36.5	1775 – 1850	Gently sloping coalesced alluvial fan slopes and flat valley bottom (Huntington Valley)	Quaternary sedimentary materials (Qs)	Crossing of a major fault zone (assumed) near MP 28.5		w/in 4 – 5 mi. of the Huntington Creek (Eureka White Pine) Mining District and Chase Mining District; scattered oil wells in Huntington Valley

TABLE 3.1-1: ELEVATION, TOPOGRAPHY, GEOLOGY, AND HAZARDS (CONT.)

Milepost	Elevation (meters)	Topography	Geology	Hazards	Features within ½ mile	Features within 10 miles
36.5 – 41.0	1850 – 1925	Gently sloping dissected alluvial fans and low to moderately sloping hills	Quaternary sedimentary materials (Qs); minor Tertiary sedimentary and volcanic rocks (Tys)		Gravel pit w/in ½ mi.	w/in ¼ mi. of prospects; w/in 3 mi. of Bald Mountain Mine proposed process area expansion in the Bald Mountain Mining District; w/in 4 – 5 mi. of the Huntington Creek (Eureka White Pine) Mining District and Chase Mining District; geothermal wells in Diamond Valley
41.0 – 52.5	1775 – 1950	Flat valley bottom (Newark Valley) and gently sloping alluvial fan slopes at foot of Ruby Mountains	Quaternary sedimentary materials (Qs)		Gravel pit w/in ½ mi.; geothermal well w/in ½ mi.	Prospects w/in 1 mi.; gravel pit w/in 2 mi.; w/in 8 mi. of Diamond Mining District; scattered oil wells and geothermal well in Newark Valley
52.5 – 65.0	1950 - 2175	Gently to steeply sloping mountain slopes and hills (Ruby Mountains)	Devonian – Mississippian Chainman Shale, Joana Limestone and Pilot Shale (MD); Tertiary older volcanic rocks (Tov); and Quaternary sedimentary rocks and materials (Qs)	Crossing of minor fault; erosion	Crossing of Bald Mountain Mining District; numerous prospects w/in ¼ mi.; oil well w/in ½ mi.	w/in 3 mi. of Alligator Ridge Gold Mine; w/in 2 – 3 mi. of numerous prospects; scattered oil wells in Long Valley
65.0 – 70.5	1875 – 1950	Gently sloping alluvial fan apron of Dry Mountain	Quaternary sedimentary rocks and materials (Qs); Permian Arcturus and Rib Hill Frm (Par); and Pennsylvanian Riepe Spring Limestone of Steele (PP)	Crossing of a major fault zone	Gravel pit w/in ¼ mi.	
70.5 – 74.8	1800 – 2000	Dissected sloping alluvial fans and gently sloping hills of White Pine Range	Quaternary sedimentary rocks and materials (Qs); Tertiary older volcanic rocks (Tov)	Erosion	w/in ½ mi. of gravel pit and drill hole; oil wells w/in ½ mi.	w/in 1mi of Illipah Mining District; scattered oil wells in Newark Valley
Segment F						
0 – 14.0	1725 – 2075	Alluvial fans and flat valley bottom	Quaternary older alluvium (Qoa), and minor areas of Quaternary alluvium (Qal) and Tertiary volcanic rocks undivided (Tvu)	Crossing of major fault zone near MP 1.5		w/in ½ mi. of gravel pit; w/in 4mi of Prince of Wales Mine; w/in 1 mi. of Alpha Mining District, 6 mi. of Diamond Marsh Mining District
14.0 – 16.8	2075 – 2150	Compound alluvial fans/pediment	Ordovician Vinini Formation (Ov) and minor Jurassic to Tertiary intrusive rocks (ir)	Crossing of two unnamed faults near Mt. Hope	Prospects w/in ½ mi.; crosses Mt. Hope Mining District	w/in 2 mi. of Mt. Hope Mine; w/in 4 mi. of Antelope (Eureka) Mining District
Segment G						
0 – 2.0	2000 – 2150	Compound alluvial fans/ pediment	Ordovician Vinini Formation (Ov) and Quaternary older alluvium (Qoa)	Crossing of short unnamed fault	Crosses Mt. Hope Mining District; prospects w/in ½ mi.	w/in 2 mi. of Mt. Hope Mine; w/in 4 mi. of Antelope (Eureka) Mining District, and 8 mi. of Alpha Mining District

TABLE 3.1-1: ELEVATION, TOPOGRAPHY, GEOLOGY, AND HAZARDS (CONT.)

Milepost	Elevation (meters)	Topography	Geology	Hazards	Features within ½ mile	Features within 10 miles
2.0 – 17.5	1850 – 2000	Alluvial fans and flat valley bottom	Quaternary older alluvium (Qoa)		Gravel pit and a few prospects w/in ½ mi.	w/in 4 mi. of Mt. Hope Mine; w/in 5 mi. of Lone Mountain (Eureka) Mining District
17.5 – 19.9	1850 – 2000	Alluvial fans/pediment	Ordovician Vinini Formation (Ov) and Quaternary older alluvium (Qoa), Devonian Devil's Gate Limestone (Dd) and Mississippian Undivided sedimentary rocks (Chainman and Diamond Peak FRS.)	Crossing of fault	Gravel pit w/in ½ mi.	w/in 1 – 4 mi. of prospects;; w/in 2 mi. of Yahoo Canyon mine and w/in 3 mi. of Eureka Mining District and 6 mi. of Fish Creek Mining District
Segment H						
0 – 2.0	2000 – 2200	Moderate to gently sloping alluvial fans/pediments	Ordovician Vinini Formation (Ov) and minor Jurassic to Tertiary intrusive rocks (ir) and Quaternary older alluvium (Qoa), and Devonian Nevada Frm (Dn)		w/in ½ mi. of Mt. Hope Mine and numerous prospects; crosses Mount Hope Mining District	w/in 5 mi. of Antelope (Eureka) Mining District, 7 mi. of Alpha Mining District
2.0 – 4.5	1950 – 2000	Gently sloping alluvial fans	Quaternary older alluvium (Qoa),			w/in 1 – 2 mi. of Mt. Hope Mine and numerous prospects
4.5 – 7.0	1850 – 2050	Moderate sloping hills and alluvial fans/pediments	Ordovician Vinini Formation (Ov) and minor Devonian sedimentary rocks undivided (Deu), Permian Garden Valley Frm (Pg)	Erosion		w/in 1 – 2 mi. of 2 gravel pits, mine shaft and scattered prospects
7.0 – 20.5	1850 – 1900	Gently sloping alluvial fans and flat valley bottom	Quaternary alluvium (Qal) and older alluvium (Qoa)	Expansive soils in valley bottoms	w/in ½ mi. of gravel pit	w/in 1 – 2 mi. of 2 gravel pits, mine shaft and scattered prospects; w/in 8 mi. of Diamond Mining District; 3 mi. of Eureka Mining District, and 7 mi. of Fish Creek Mining District; scattered oil wells in Diamond Valley
Segment I						
0 – 6.5	1800 – 2000	Gently sloping alluvial fans and flat valley bottom	Quaternary older alluvium (Qoa)		w/in 500 feet of Ruby Hill gold mine stockpile and rock waste dump; w/in ¼ mile of gravel pits and scattered prospects	w/in 1 – 2 miles of Eureka Mining District, and w/in 6 mi. of Fish Creek Mining District; numerous mines and prospects
6.5 – 13.0	1820 – 2250	Steep dissected hill slopes of Diamond Mountains	Quaternary volcanic rocks undivided (QTvu), Mississippian sedimentary rocks, undivided (Mu) including the Diamond Peak Frm (Md) and minor Cretaceous Newark Canyon Frm (Kn).	erosion, slope instability	Crosses Eureka Mining District; w/in ¼ mi. of gravel pit	w/in 4 mi. of prospects; w/in 3 mi. of Pinto Mining District

TABLE 3.1-1: ELEVATION, TOPOGRAPHY, GEOLOGY, AND HAZARDS (CONT.)

Milepost	Elevation (meters)	Topography	Geology	Hazards	Features within ½ mile	Features within 10 miles
13.0 – 28.5	1800 – 1900	Flat valley bottom to gently sloping alluvial valley (Newark Valley)	Quaternary sedimentary materials (Qs)			w/in 1 mi. of gravel pit; w/in 2 mi. of Newark Mining District; scattered oil wells in Newark Valley
28.5 – 30.3	1900 –2050	Gently sloping alluvial fan/pediment and moderately sloping hills	Mississippian Diamond Peak Frm (White Pine Range)			w/in 1 mi. of Pancake Mining District and 1 mi. of Illipah Mining District
Segment J						
0 – 9.0	2025 – 2250	Moderate to steeply sloping dissected hills and interspersed gently sloping valleys of the White Pine Range and Butte Mountain	Permian Arcturus Frm. and Rib Hill Sandstone (Par); Pennsylvanian Riepe Spring Limestone (Ely Limestone) (PP); Diamond Peak Frm (Md) and Chainman Shale, Joanna Limestone and Pilot Shale (MD); Tertiary older volcanic rocks (Tov); Tertiary younger sedimentary and volcanic rocks (Tov); and minor Tertiary younger ash-flow tuffs (Tyt); Quaternary sedimentary materials (Qs)	Erosion, slope stability; fault crossing	Crossing of Illipah Mining District	w/in 1 mile of scattered prospects; scattered oil wells in Antelope Mountain and Butte Mountains
9.0 – 18.5	1950 – 2100	Gently sloping valleys, fans and flat valley bottom (Jakes Valley)	Quaternary sedimentary materials (Qs)	Major fault zone crossing near MP 13.5	w/in ½ mi. of 2 gravel pits	w/in 1 mi. of scattered prospects; oil well in Butte Mountains
18.5 – 30.0	2100 – 2400	Moderate to steeply sloping dissected hills and gently sloping alluvial valleys of Egan Range	Tertiary older volcanics (Tov); Permian Arcturus Frm; Rib Hill Sandstone (Pr); Pennsylvania Riepe Spring Limestone (Ely Limestone) (PP); and Quaternary sedimentary materials (Qs)	Erosion, slope stability; 1 minor fault crossing		w/in 1 mi. of gravel pit and scattered prospects and oil wells
30.0 – 40.1	1875 – 1950	Gently sloping alluvial fan and valley bottom; crossing of steep hill in southern Smith Valley and just south of Hercules Gap	Tertiary sedimentary materials (Qs) and minor Devonian Guilmette Frm (Dg) and Ordovician Lower Part Pogonip Group and Eureka Quartzite (Ol)	1 major fault crossing at MP 36; 1 minor fault crossing; erosion on the two steep hills	w/in ¼ mi. of gravel pit	w/in 1 mi. of min shaft so. of State Prison and w/in 1 mi. of scattered prospects; w/in 1 mi. of San Francisco Mining District, 2 mi. of Duck Creek Mining District and 3 mi. of Robinson Mining District; scattered oil wells and geothermal wells

TABLE 3.1-1: ELEVATION, TOPOGRAPHY, GEOLOGY, AND HAZARDS (CONT.)

Milepost	Elevation (meters)	Topography	Geology	Hazards	Features within ½ mile	Features within 10 miles
K Re-route						
0 – 4.5	1650 – 2060	Steep hills and canyons (Toiyabe Range): gently sloping fan slopes of Upper Grass Valley	Oligocene Caetano Tuff (Itc) and Devonian Slaven chert (Ds): Quaternary fan deposits (Qf))	Crossing of fault and thrust fault: slope instability; erosion; crossing of Cortez Mining District	Spring Mine and many prospects w/in ½ mile	Mines and many prospects w/in 1 – 5 miles of TL; w/in 7 mi. of Buckhorn Mining District and 8 mi. of Bullion Mining District
L Re-route						
0 – 7.0	1450 – 1600	Gently sloping alluvial apron	Quaternary alluvial fan deposits (Qf)			w/in 1 mi. of Argenta Mining District, 3 mi. of Bateman Canyon Mining District; 4 mi. of Beowawe Mining District and 8 mi. of Bullion Mining District

3.1.3 ENVIRONMENTAL CONSEQUENCES

This section presents the project-related actions for construction and long-term operation that may have significant impacts on the geological environment, extraction of mineral, oil, gas and geothermal resources, as well as significant geologic hazards that may affect the safety and operational reliability of the transmission line facilities. This section also include mitigation to avoid or eliminate the impacts or reduce the effects to a less-than-significant level. The specific locations for the transmission towers, materials yards and spur roads have not yet been determined. Therefore, this assessment addresses potential impacts, some of which are likely to be avoided by discretionary site selection decisions by the project engineers and construction contractor. Site-specific impacts and mitigation measures will be addressed fully in the COM Plan. However, for purposes of a conservative analysis in this EIS, no assumptions are made about specific siting to avoid hazards or impacts.

As many of the route alternatives share segments (e.g., Segments A and J are common to all of the routes), the analysis first addresses impacts that are common to all of the route alternatives. It then examines impacts that are specific to each of the route alternatives. This serves to reduce redundancy in discussion of the impacts and to present a clearer comparison of the alternatives. A discussion of the No Action alternative is also included.

SIGNIFICANCE CRITERIA

Project construction and operation activities would have a significant impact on topography due to grading, erosion, and other effects if they would occur on steep slopes.

A significant impact would result if the proposed facilities were to fail or create hazards to adjacent property due to:

- Effects of fault rupture or other earthquake effects from an earthquake; and/or
- Natural or induced soil movements and slope instability; and/or
- Adverse soil conditions (e.g., soft compressible, expansive, or corrosive soils).

A significant impact would result if:

- The proposed facilities were to cross an existing or proposed mining operation with an approved mining plan and/or preclude mining operations or leasing of oil, gas, and geothermal resources in the affected area.

Steep Slope
Slope is not a specific environmental attribute that would be affected by project construction and operations. However, slope is an indicator of the relative degree of hazard and potential impact because it has a strong influence over grading requirements, relative stability of earth materials, soil erosion potential, and other factors. Therefore, slope brings together a range of conditions and hazards that indicate the potential for impact. Other geologic factors have substantial influence as well, but slope is generally a good measure of hazard and impact. The hazard increases with slope; thus, construction activities and placement of transmission towers or other facilities on slopes with 15% or greater gradient are considered to constitute high potential for significant impact before mitigation. Construction activity and placement of transmission towers or other facilities on slopes with 4% or less gradient are considered to constitute a low potential for significant impact.

Fault Zone Crossing
Placement of transmission towers or other facilities within active (Holocene or historic) fault hazard zones is considered to constitute a high potential for significant impact before mitigation. Similarly, construction in areas of potential liquefaction hazards would constitute a potentially significant hazard and impact.

Slope Stability
Placement of transmission towers or other facilities within unstable slopes and soils subject to rapid displacement (e.g., from landslides and earthflows) requiring substantial engineering to ensure stability of the structures is considered to constitute a high potential for significant impact before mitigation.

Mining
Active mining claims in the study area are concentrated along Segments B, E and I. The major gold companies with active claims in the study area are Placer Dome, Newmont Gold, Homestake Mining, Cortez Gold, and Oro Nevada Exploration. As listed in the database developed by the Nevada Bureau of Mines and Geology (see separate technical memorandum "Active Mines, Oil/Gas Wells and Geothermal Wells Within 10 Miles of the Falcon to Gonder Transmission Project" (EDAW 2001), the number of active mines within 10 miles of proposed transmission corridor segments include the following: Three active mines in the vicinity of Segment B (Cortez Gold Mines, Mule Canyon Gold Mine, and Argenta Barite Mine). Mule Canyon and Argenta are also within 10 miles of Segments A and the L re-route, and Cortez is within 10 miles of the Segment K re-route. Three active mines are found within 10 miles of Segment E (Yankee Gold Mine, Alligator Ridge Gold Mine and Bald Mountain Gold Mine). One mine (Ruby Hill Gold Mine) lies close to Segment I, and also within 10 miles of Segments G and H. There are also a few individuals and some small gold exploration companies that have active claims in or near the ROW (see also Section 3.13, Land Use and Access). Through early communications with the existing mining companies, SPPC made efforts to site the route alternatives to avoid active mining claims and potential mineral development areas.

All the route alternatives would cross mining districts. However, few areas within these districts are currently being mined, and this land use category only indicates areas with commercial mining potential. Within these mining districts are approximately 122 active mining claims in the study area. Of these, 70 claims are within or adjacent to the ROW, while 52 claims are outside of the ROW vicinity. The proposed transmission line would pass within about 450 feet of a stockpile at the Ruby Hill gold mining

project near Eureka. Interference with the Ruby Hill gold mine is not expected, as there are no known plans for expansion of the mine to the north and the mine is anticipated to begin reclamation in about one year.

The transmission line would not be expected to preclude or substantially interfere with extraction of leasable gas, oil and geothermal resources, as these resources can usually be tapped at several locations or drilling can be done at an angle to avoid transmission line towers. Drilling pads can be located to allow sufficient separation from a transmission line so as not to interfere with the operations of either facility. The proposed transmission line would be routed to avoid effects on the Beowawe Geothermal Plant (Segment B) and the transmission line would not have any significant impact on operation of the geothermal resources field. In general, transmission lines can span and clear almost any geothermal facility, and that is common in many developed geothermal fields.

Similarly, while Segment D of the proposed transmission line would pass near the Pine Valley Oil Field, it would not interfere with existing operations. On all route segments, only one oil well is in the immediate alignment (Segment B would pass directly at ATR Ginn No. 1-13). Oil/gas wells within 1,000 feet horizontally of a proposed corridor segment include two for Segment B, one for Segment C, one for Segment D, and four for Segment E (see technical memorandum: "Active Mines, Oil/Gas Wells and Geothermal Wells Within 10 Miles of the Falcon to Gonder Transmission Project" (EDAW 2001). In general, a 1,000-foot separation from any existing well may be considered ample distance to ensure no interference with operation of that well.

ENVIRONMENTAL IMPACTS – COMPARISON OF ROUTE ALTERNATIVES

Impacts Common to All Route Alternatives

The following presents the impacts and associated mitigation measures that are common to all route alternatives. The transmission line would traverse a wide variety landforms and geological materials, which pose site-specific constraints and potential for impact. While the constraints and impacts would be specific to given sections of a segment, there is a commonality of constraint types and potential impacts, which are described below.

In addition, the transmission would pass through a number of mining districts; and the potential for impact on existing and planned mining operations would be unique to each mining area. However, the nature of the impact would be similar for each mining area; therefore, the impacts are discussed in the following section.

❑ ***Impact Geo-1: Construction on Steep or Unstable Slopes***

The project would require local grading that would alter the topography, particularly on steep slopes. Grading potentially could create unstable cut-and-fill slopes, especially on steep slopes and areas with weak rock materials. Most grading would be required for construction of suitable footings for the transmission towers. Some grading would be needed for the centerline travel route, temporary spur roads, widening of existing access roads, construction pads for structure sites located on steep slopes -- in order to provide safe and level surfaces for excavation equipment, cranes, bucket trucks, and tower assembly. Hazards from unstable slopes and seismic hazards could affect roads; however, in general, the impacts are likely to be less than significant. Debris clearing and road repair would be required as a normal response to such an event.

Most transmission tower construction would involve minor excavations and fill, and the potential impact on the environment would be less than significant. However, some sites would encounter steep and difficult terrain or would be subject to geotechnical hazards that would need

to be corrected before the towers are constructed. Such conditions potentially would include the following:

- Steep slopes (generally 15% or greater) may require fill or cuts to accommodate the footings for the towers or provide sufficient space for the necessary road surface width, grade, and turning radius.
- Soft, compressible soils may require deeper footings for the towers, or imported fill material, or concrete to provide suitable restraint to meet code requirements. Similarly, weak soils may have to be re-graded or reinforced with imported fill material to provide a suitable base for access by construction and maintenance equipment.
- Unstable slopes may need to be stabilized to ensure that the towers and roads would be protected from hazards that may result in tipping or failure of a road. This may include unstable slope hazards at the immediate construction site as well as adjacent areas that could affect the site. Such hazards may include landslides, rockfall and debris avalanches, mudflows, erosion on steep slopes, and areas subject to liquefaction in earthquakes.

The preceding geotechnical hazard conditions would be site specific. As individual tower placement and road construction plans are not yet available, the hazards and impacts are treated here generically. The hazards would be evaluated by SPPC or its contractors for each tower location site and road construction area. The options would be avoidance of the site by selection of a site with stable conditions or correction of the unstable slope conditions, which usually entails grading and other methods. Correction of the unstable soil conditions would have potential impacts, notably topographic alteration produced by cut-and-fill slopes. If not properly engineered and constructed, the cut-and-fill slopes themselves could create unstable conditions in the long-term, which could compromise the operational reliability of the line. Construction spoil material could be improperly dumped at the site, creating unstable soil conditions.

The impact is significant and mitigation would be required as presented in the following mitigation measures.

❑ ***Mitigation Measure Geo-1a***

SPPC would retain a qualified engineering geologist to evaluate if geotechnical hazards and unstable slopes are present on the centerline route and areas of new road construction or widening on slopes with over 15% gradient. The engineering geologist would evaluate the nature of the steep slope and/or unstable soil hazard at tower sites with these constraints and the immediate vicinity to allow options for avoiding the hazard. The evaluation should be based on an inspection of all sites where towers or roads would be constructed with slopes of 15% or greater or identified slope instability hazards. Soil testing would be conducted, if needed, to ascertain the depth and lateral extent of unstable materials, and consideration of hazards both upslope and downslope of the site. The engineering geologist would prepare a report that includes recommendations for moving the towers or roads, or identifies construction methods to stabilize the site or off-site areas that would threaten the hazard sites if the structures cannot be moved. SPPC would incorporate the recommendations of the engineering geologist into its COM Plan, including construction drawings and details for grading, drainage, specialized slope treatment (e.g., installation of retaining walls, wire retention structures, gabions, berms to deflect debris avalanches, etc.). SPPC's construction contractor would implement the plans, and SPPC quality assurance inspectors and the environmental monitors would inspect and certify that the slopes have been constructed and stabilized in accordance with details in the COM Plan.

❑ ***Mitigation Measure Geo-1b***

Under no circumstances would cut-or-fill slopes be allowed to pose a temporary or long-term hazard to the project facilities or to off-site property. All cut slopes would be cut at an angle of repose and/or benched or otherwise protected to ensure its long-term stability. SPPC would commit to appropriate re-contouring, erosion control, and reseeding of all cut-and-fill slopes. SPPC would also ensure the long-term stability of all slopes. Monitoring and stability requirements would be detailed in the Reclamation section of the COM Plan.

❑ ***Mitigation Measure Geo-1c***

To reduce the environmental impacts of slope alteration, all practicable measures should be taken to avoid sites for towers and roads that have severe geotechnical hazards requiring substantial grading and other engineering of cut-and-fill slopes.

❑ ***Impact Geo-2: Construction in Seismic Hazard Areas***

The project would be subject to earthquakes that could damage facilities and affect reliable use of the line. The entire region is located within Zone 2 or 3 of the Uniform Building Code (UBC), which represents an area of seismic hazard. Primary earthquake hazards include damage from ground displacement along a fault zone, severe ground shaking, and induced secondary hazards such as liquefaction, rapid differential settlement, lurching, landslides, and rockfalls. Most of the earthquake-related hazards can be accommodated by engineering design or avoidance of high hazard areas. In general, the most severe hazard is posed by ground displacement along a fault zone. Vertical or lateral ground displacement induced by movement along a fault zone could result in transmission tower tipping. Such events have been rare in the United States because location of transmission towers in active fault zones is generally avoided by prudent siting. Often, known and mapped fault rupture zones can be avoided or spanned. Usually, there is sufficient leeway in conductor wires to accommodate some ground displacement without damage to the wires. In major earthquakes, wrapping of conductors potentially could occur as a result of the ground motions, resulting in operational failure.

Severe ground shaking also can damage towers, although that is a fairly rare occurrence in the United States. The Landers Earthquake in 1992 in California resulted in sufficient ground shaking to damage towers on soft soils in which amplified ground movements occurred during the earthquake. Most of the transmission corridor would be located on deep alluvial soils that may be generally expected to experience amplified ground shaking during earthquakes. The greatest hazards to the facilities from ground shaking would occur where they are located on alluvial soils and artificial fill, especially un-engineered fill (e.g., old road fills and mining spoils dumps). Ground shaking on bedrock substrate potentially may result in some damage to transmission towers if the shaking is violent. In general, however, the nature of ground shaking on bedrock has had minor effect on transmission towers even for large earthquakes in the United States. As a general rule, the vibration and motion established by earthquakes is no greater than the maximum induced by severe windstorms. The evaluation of both earthquake-induced vibration and wind-induced vibration should be carried out in conjunction with one another.

Liquefaction is the rapid loss of physical soil structure caused by ground shaking of saturation of fine sandy soil and the resultant change in water pore pressure; in effect, the soil becomes fluid like quicksand. Liquefaction results in a loss of the ability of the soil to support structures. Tower footings could lose their support and sink or become laterally displaced. The towers could be damaged or tip. Liquefaction hazard only occurs in soft soils, like alluvium, but not all alluvial soils are subject to liquefaction. Alluvium must have at least one stratum of material that is comprised of fine sandy material and is saturated by groundwater. If these conditions are not met in a substantial, relatively thick stratum in the alluvium, then the potential for liquefaction is

very low. As a whole, it is expected that the hazard would be most prevalent in the flat valley bottom areas or areas near the base of an alluvial fan. However, alluvial fills in valley bottoms even in valleys in the mountains would be subject to liquefaction hazard if the soils are sandy and saturated. There are other related effects in alluvial soils, such as lurching (the lateral movement of the ground surface toward an unsupported face, such as a river bank), lateral spreading (the lateral displacement of the ground surface usually related to liquefaction of saturated soils), collapse of stream banks created by ground shaking, and differential rapid settlement resulting from sudden changes in the physical structure of the supporting soils.

Additional secondary effects of earthquakes include induced landslides and rockfalls. The ground shaking accompanying an earthquake may be sufficient to dislodge unstable soil and rock material. The hazard to the facilities would depend on the location of the facilities in relation to the landslide or rock avalanche slope. Transmission towers and roads could be sited on unstable soils that move laterally or horizontally and result in damage to the facilities. Similarly, adjacent landslides may move onto the site of the towers or roads, burying them in debris. Earthquakes have often reactivated ancient landslides that have remained conditionally stable for centuries. The ground motions of the earthquake reactivate movements on the slide plane. In mountainous areas with steep slopes, rockfall avalanches may be created by earthquake ground shaking that could damage towers and cover roads.

❑ ***Mitigation Measure Geo-2a***

To reduce the hazards of damage from ground rupture, all practicable measures should be taken to avoid sites for transmission towers that are located within known fault zones. Fault zones with a record of historic or Holocene (within the last 10,000 years) fault displacement should be considered capable fault zones. A geotechnical engineering investigation will be conducted for the project. A licensed geotechnical engineer will conduct the investigation in a manner consistent with Nevada geologic and engineering standards. The geotechnical engineer will prepare a report that summarizes the results of a field investigation, including site inspection and soil testing, potential geologic hazards (including fault rupture and severe secondary effects of earthquakes), and design criteria and construction methods to effectively construct the project with an acceptable level of risk. The report will address all geologic and geotechnical factors related to the design and construction of the project. The geotechnical engineering investigation will delineate areas of active and potentially active faults. To the extent possible, it will identify fault traces and locate them in the field so faults can be avoided during tower siting. A more detailed geologic investigation may be necessary in some active and potentially active fault areas if the trace is not sufficiently defined by surface geologic features.

Transmission lines will necessarily cross active fault zones. The large span length and tower design will tolerate deflections greater than the maximum horizontal or vertical displacements that would be anticipated from worst-case fault rupture. While it may not be possible to entirely eliminate the potential for tower failure in a fault rupture zone, it is possible to design and construct the facilities to criteria that establish an acceptable level of risk.

❑ ***Mitigation Measure Geo-2b***

To reduce the hazards of damage from ground shaking and secondary earthquake hazards (liquefaction, lurching, lateral spreading, rapid differential settlement, induced land sliding, and rock-fall avalanche), all practicable measures should be taken to design and construct the transmission towers and substation facilities and equipment to withstand the projected ground shaking associated with the maximum probable earthquake (MPE) in the area. SPPC's project geotechnical engineering investigation will provide regional seismic criteria for the design of project facilities including transmission components, new roads, and substation additions. To minimize potential damage from ground shaking and secondary earthquake effects, SPPC would

design the transmission line structures using project-specific criteria in accordance with the latest revision of the National Electric Safety Code (ANSI C.2). Substation facilities would meet the appropriate design criteria contained in the most current edition of the Uniform Building Code for the seismic zone in which they are located.

❑ ***Impact Geo-3: Construction in Problematic Soils***

The proposed facilities would be located in areas that may have problematic, expansive clay soil and/or corrosive and hydro-thermal soil. Expansive clay soils swell when wet and shrink when dry. The result of this soil behavior can be damaging to roadbeds. Some soils along the routes may be corrosive to metal and cement and over time weaken their ability to support structures. Alkaline/saline and hydro-thermal conditions in soils may enhance corrosive effects of cement, wood and metal. These effects would be most problematic for transmission tower foundations and over time they could be weakened. While this is a potentially significant impact, the effects of problematic soils generally can be readily remedied using common construction methods to engineer soils and moderate the corrosive effect. (See also Section 3.2, Soils.)

❑ ***Mitigation Measure Geo-3***

The project geotechnical engineering investigation will identify foundation problems, including presence of expansive clay soil, corrosive soil, and hydro-thermal soils, and provide recommendations for appropriate foundation design and construction solutions. Towers and foundations will be protected from corrosion and other soil problems in accordance with the geotechnical investigation and industry standards. SPPC would incorporate the recommendations of the engineering geologist into its site planning, prepare construction drawings for grading, drainage, and specialized design treatment and specify construction requirements in the COM Plan. SPPC's construction contractor would implement the plans.

❑ ***Impact Geo-4: Potential Interference with Mining***

SPPC would avoid locating the proposed transmission line such that it would conflict with existing active mining operations or proposed expansion plans (e.g., Cortez Mine on Segment B) or provide compensation where appropriate and reasonable for existing holders of active mining claims within the right-of-way. Thus the project would not have a significant impact on existing mining operations or active claim holders. Once constructed, however, the transmission line could potentially conflict with future plans for mineral development in the right-of-way.

❑ ***Mitigation Measure Geo-4***

If there are existing mining rights associated with private lands or existing active mining claims on public lands, SPPC would attempt to evaluate and compensate for the loss of potential mining profits based on available information (e.g., existing records, site evaluations, etc.) in order to utilize the land to construct the proposed transmission line. As an alternative to compensation for loss to potential mining profits, SPPC and the landower or existing active claim holder may negotiate a settlement covering relocation of the transmission line or specific towers so as to present no substantial limitation to the future development of any mining rights or claims (personal communication with John Berdrow, SPPC, March 22, 2001). Compensation for the loss of potential mining profits and the conditions for relocation would be site specific and handled on a case-by-case basis. Thus, the proposed transmission line would not have a significant impact on mineral development.

As all of the route alternatives include Segments A and J, their geologic characteristics and potential impacts are discussed below.

Segment A

The Falcon substation is located in Boulder Valley. As shown in Table 3.1-1, from Milepost (MP) 0 to 8.5, the transmission line crosses the flat alluvial floodplain of Boulder Valley, rising to foot of the Shoshone Range. The substrate is comprised of deep alluvium on almost flat topography. From MP 8.5 – 16.7, the alignment skirts the western edge of Whirlwind Valley along the gently sloping coalesced alluvial apron at the foot of the Shoshone Range. The route runs parallel to an existing transmission line. Substrate varies between Quaternary older alluvium and bedrock of Tertiary volcanic materials (basaltic andesites) (Roberts et. al. 1967). A major fault zone is crossed at about MP 6.6 near Dunphy. No mines are located in the immediate segment vicinity though the Mule Canyon and Argenta Mines are within 10 miles. The route passes near the Beowawe Mining District, and the Argenta Mining District is in the general vicinity (i.e., within 10 linear miles of the route). The NBMG database lists one oil/gas well and 54 geothermal wells within 10 miles of Segment A. However, since none of the wells are located in or near the immediate Segment alignment, no impact is anticipated.

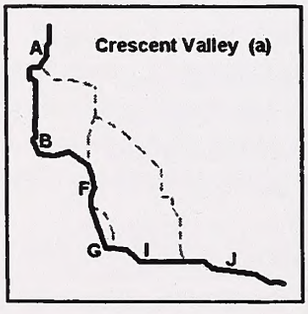
Segment J

As shown in Table 3.1-1, Segment J largely crosses gently and moderately sloping areas of older and younger age alluvial fans and flat valley floor areas comprised of alluvial deposits in Jakes Valley, Smith Valley, and Steptoe Valley (Hose and Blake 1976). Moderate and steep slopes are encountered in the Antelope Mountain area, Butte Mountains, and Egan Range, where volcanic rocks and sedimentary rocks of the Tertiary and Paleozoic crop out (Hose and Blake 1976). Two major fault zones are crossed by the segment: at MP 13.5 on the eastern side of the Butte Mountains, and at MP 36 on the eastern side of the Egan Range. The segment passes through the Illipah Mining District. The San Francisco, Robinson, and Duck Creek Mining Districts are in the general vicinity of the segment. The NBMG database lists no active mines, 20 oil/gas wells and 20 geothermal wells within 10 miles of Segment J. Since none of the mines or wells is located within one mile of the segment, no impact is anticipated.

Alternative-Specific Impacts

In addition to the impacts common to all route alternatives, the following presents impacts associated with specific route alternatives. Because the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

Crescent Valley (a) Route Alternative



The Crescent Valley (a) route alternative is comprised of Segments A, B, F, G, I, and J. In addition to the impacts common to all route alternatives discussed above (i.e., Impact Geo-1 through –4), specific impacts for the Crescent Valley (a) route alternative are described below.

Segment B

❑ ***Impact Geo-5: Potential Conflicts with Cortez Gold Mine and Oil/Gas Well ATR Ginn No. 1-13***

Segment B passes close to the existing Cortez gold mine open pit, heap leach pads, and process area, including mine tailings. While the proposed route bypasses this existing mine area, it would substantially conflict with the Cortez Gold Mine's newly proposed Pediment Mine Project, also on Segment B, which would be a significant impact. A plan of operations for the Pediment Mine

Project was submitted to the BLM's Battle Mountain Field Office in January 2001 (Collord 2001). In addition, while the transmission line would not directly affect the proposed South Pipeline mining operations area (BLM 1999), it would pass through that project's area boundary. The NBMG database lists three active mines, 12 oil/gas wells and 88 geothermal wells within 10 miles of Segment B. The transmission project could affect at least one active oil/gas well (ATR Ginn No. 1-13) located directly on the route in Segment B, as identified in the NBMG database. While interference with operation of the well is unlikely; for safety reasons, it probably would be desireable not to co-locate the transmission facility and the well. However, any impact could be avoided entirely by using the Segment L re-route, which circumvents this well. The segment passes through the Beowawe geothermal field, but does not impact the geothermal power plant facilities and would not be expected to impact operations of the geothermal field.

❑ ***Mitigation Measure Geo-5***

SPPC will negotiate with the owners of the Cortez gold mine regarding planned future operations. If no conflict appears to occur with future mining operations, mitigation would not be required. However, if a potential conflict with operations or planned expansion of mining into the transmission corridor would occur, SPPC would either relocate its transmission line or negotiate with the gold mine owners to provide compensation.

Table 3.1-1 presents information about the topography and geology of Segment B. Segment B largely crosses gently sloping to flat areas of older and younger age alluvial fans, and valley floor areas comprised of alluvial deposits in Crescent Valley, the upper end of Grass Valley, upper Horse Creek Valley and Denay Valley (Stewart and McKee 1977; Roberts et al. 1967). Mountain areas with steeper slopes and varied geologic rocks are encountered in crossings of the Malpais Hills and Cortez Mountains that include volcanic basaltic andesite, limestone, and Vinini Formation rocks Valley (Stewart and McKee 1977; Roberts et al. 1967). The route passes near a hydro-thermal area in Whirlwind Valley near MP 3. A major fault zone is crossed at four locations: near MP 9 in the Malpais Hills; at MP 32-33 at the western edge of the Cortez Mountains, at MP 41 on the southern side of the Cortez Mountains, and at MP 54 in Denay Valley.

The route passes near the large open pit Cortez gold mine at MP31-33. The northern end of the route impinges on the edge of the Beowawe Mining District, and the Argenta, Bateman Canyon, and Bullion Mining Districts are in the general vicinity. The middle section of the segment passes through the Cortez Mining District in two locations. Numerous mines are concentrated in the Cortez Mountain section. The Buckhorn and Alpha Mining Districts are within the general vicinity.

K re-route (on Segment B)

Table 3.1-1 presents information about the geological environment of the K re-route, which was identified as a possible way to avoid sensitive resources on a portion of Segment B. The K re-route largely crosses moderately and steeply sloping areas of in the Cortez Mountains, where Quaternary volcanic rocks and fan deposits and Paleozoic sedimentary rocks crop out (Stewart and McKee 1977). No major fault zone is crossed by the segment. An important thrust fault is located in the vicinity and may underlie the segment. The K re-route passes through the Cortez Mining District, and is within 10 miles of the active Cortez mine. The Buckhorn and Bullion Mining Districts are in the general vicinity of the re-route.). The NBMG database lists four geothermal wells and no oil/gas wells within 10 miles, but beyond 5 miles, of Segment K re-route; therefore, no impact is anticipated.

L re-route (on Segment B)

Table 3.1-1 also presents information about the geological environment of the L re-route. This re-route was identified as a possible way to avoid sensitive resources on a portion of Segment B. The L re-route largely crosses gently sloping on fan slopes of the Shoshone Range (Stewart and McKee 1977). No major fault zone is crossed by the re-route. The L re-route passes through the edge of the Argenta Mining

District, and is within 10 miles of the active Mule Canyon and Argenta mines. The Beowawe, Bateman Canyon, and Bullion Mining Districts are located in the general vicinity of the re-route. The NBMG database lists 54 geothermal wells and four oil/gas wells within 10 miles of Segment L re-route. However, no impacts are anticipated, since none of these wells are in close proximity.

Segment F

As shown in Table 3.1-1, Segment F largely crosses gently sloping to flat areas of older and younger age alluvial fans, and valley floor areas comprised of alluvial deposits in Garden Valley (Roberts et al. 1967). Moderate slopes are encountered in the Hope Mountain area, where volcanic rocks and sedimentary rocks of the Vinini Formation crop out (Roberts et al 1967). A major fault zone is crossed near MP 1.5 on the northwestern side of the Roberts Mountains. The route passes through the Mount Hope Mountain Mining District. The Alpha, Antelope (Eureka) and Diamond Marsh Mining Districts are in the general vicinity of the segment. The NBMG database lists no active mines, 12 geothermal wells and 5 oil/gas wells within 10 miles, but none within one mile, of Segment F; therefore, no impact is anticipated.

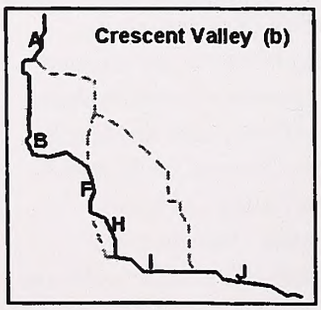
Segment G

As shown in Table 3.1-1, Segment G largely crosses gently sloping areas of older and younger age alluvial fans, and flat valley floor areas comprised of alluvial deposits in Kobeh Valley (Roberts et al. 1967). Moderate slopes are encountered in the Hope Mountain area, where volcanic rocks and sedimentary rocks of the Vinini Formation crop out (Roberts et al 1967). No major fault zone is crossed by the segment. The northern end of the route passes through the Mount Hope Mountain Mining District. The Antelope (Eureka), Alpha, Lone Mountain (Eureka), Eureka, and Fish Creek Mining Districts are in the general vicinity of the segment. The active Ruby Hill Mine, though within 10 miles, lies closest to Segment I. The NBMG database lists three geothermal wells and no oil/gas wells within 10 miles, but all beyond 5 miles, of Segment G; therefore, no impact is anticipated.

Segment I

Segment I largely crosses gently and moderately sloping areas of older and younger age alluvial fans and flat valley floor areas comprised of alluvial deposits in Diamond Valley, and Newark Valley (Roberts et al. 1967; Hose and Blake 1976). Moderate and steep slopes are encountered in the Diamond Mountains, where volcanic rocks and sedimentary rocks of the Diamond Peak and Newark Canyon Formations crop out (Roberts et al 1967). Two major fault zone is crossed by the segment: at MP 13 on the east side of the Diamond Mountains, and near MP 27 in Newark Valley. The segment passes through the Eureka Mining District, where many mines are located in the vicinity. The Fish Creek, Pinto, Newark Pancake, and Illipah Mining Districts are in the general vicinity of the segment.). The NBMG database lists one active mine (Ruby Hill Gold Mine), 11 oil/gas wells, but no geothermal wells within 10 miles of Segment I. Segment I passes within 450 feet of an existing stockpile and east waste rock dump at the Ruby Hill gold mine. The transmission line also would cross the main access road; however, an existing overhead power line already crosses the road. The proposed route bypasses the existing operation area and would not substantially interfere or conflict with the mining operation (BLM 1997). None of the oil and gas wells are located within a mile of the segment; therefore, no impact is anticipated.

Crescent Valley (b) Route Alternative

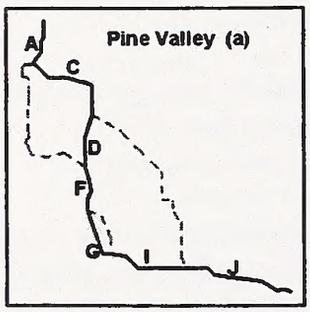


The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segment H instead of Segment G.

Segment H

As shown in Table 3.1-1, Segment H largely crosses gently and moderately sloping areas of older and younger age alluvial fans and flat valley floor areas comprised of alluvial deposits in Kobeh Valley (Roberts et al. 1967). Moderate slopes are encountered in the Hope Mountain area, where volcanic rocks and sedimentary rocks of the Vinini Formation crop out (Roberts et al 1967). No major fault zone is crossed by the segment. The northern end of the route passes through the Mount Hope Mountain Mining District. The Antelope (Eureka), Alpha, Lone Mountain (Eureka), Diamond, Eureka, and Fish Creek Mining Districts are in the general vicinity of the segment. The active Ruby Hill Mine, though within 10 miles, lies closest to Segment I. The NBMG database lists three geothermal wells and four oil/gas wells within 10 miles, but all beyond 5 miles, of Segment H; therefore, no impact is anticipated.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B.

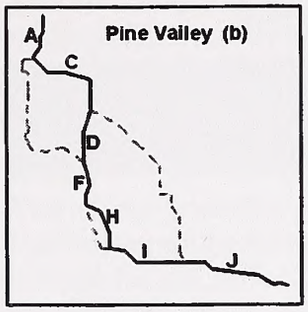
Segment C

Segment C largely crosses gently sloping to flat areas of older and younger age alluvial fans and valley floor areas comprised of alluvial deposits in Whirlwind Valley, Crescent Valley, and Pine Valley. Steep and moderate slopes are encountered in the Dry Hills and Cortez Mountains, where volcanic rocks and sedimentary rocks of the Valmy Formation and Newark Canyon Formation are encountered (Roberts et al. 1967). The route passes near a hydro-thermal area in Whirlwind Valley near MP 1-2. A major fault zone is crossed at three locations: near MP 2 in the Malpais Hills; at MP 11.5 at the western edge of the Dry Hills, and at MP 21.5 on the western of the Cortez Mountains. The route passes through the Beowawe Mining District at its northern end. The Argenta, Safford, Pine Valley, Carlin, Robinson Mountain, Larrabee, and Modarelli-Frenchie Creek Mining Districts are within the general vicinity. While the active Mule Canyon and Argenta Mines are both more than six miles away. The NBMG database lists 93 geothermal wells and 54 oil/gas wells within 10 miles of Segment C. Only one oil well (West Hay Ranch No. 12-1) is located about 1,000 feet from the segment. Because the separation from the transmission line segment is substantial, no impact is anticipated. The other wells are more distant and no impact would be anticipated.

Segment D

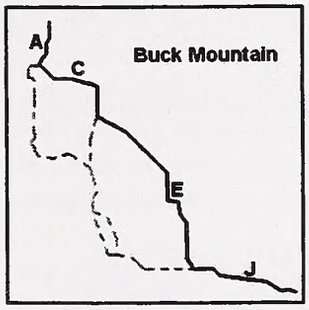
Segment D almost entirely crosses gently sloping to flat areas of older and younger age alluvial fans and valley floor areas comprised of alluvial deposits and Tertiary sediments in Pine Valley (Roberts et al., 1967; Hose and Blake 1976). A major fault zone is crossed at MP 16.5. No mining districts are crossed and there are no mines in the immediate segment vicinity. Mining districts in the general vicinity include the Pine Valley Mineral Hill, Union (Eureka-Elko), Alpha, Antelope (Eureka), Buckhorn, and Modarelli-Frenchie Creek Mining Districts. The NBMG database lists no active mines, 25 geothermal wells and 50 oil/gas wells within 10 miles of Segment D. The Segment passes through the Pine Valley Oil Field. Only one well (Big Pole Creek No. 1-11) is located about 1,000 feet from the segment. Because the separation from the transmission line segment is substantial, no impact is anticipated. The other wells are more distant and no impact would be anticipated.

Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. Segment E is unique to the Buck Mountain route and is discussed below.

Segment E

As shown in Table 3.1-1, Segment E largely crosses gently sloping to flat areas of older and younger age alluvial fans, and valley floor areas comprised of alluvial deposits in Pine Valley, Diamond Valley, Huntington Valley, and Newark Valley (Hose and Blake 1976; Coats 1987). Steep and moderate slopes are encountered in the Sulphur Spring Range, Buck Mountains, and Dry Mountain, where a variety of volcanic rocks and sedimentary rocks of the Paleozoic Era crop out (Hose and Blake 1976). A major fault zone is crossed at three locations: near MP 6 on the western side of the Sulphur Springs Range, at MP 28.5 (assumed) in Newark Valley, and at MP 70 in Newark Valley.

The route passes through the Pine Valley and Bald Mountain Mining Districts (including near the proposed Bald Mountain Gold Mine expansion area) (BLM 1995). The Modarelli-Frenchie Creek, Larrabee, Robinson Mountain, Union (Eureka-Elko), Diamond Marsh, Huntington Creek (Eureka White Pine), Chase Diamond, and Illipah Mining Districts are in the general vicinity of the segment. The NBMG database lists three active mines, 25 geothermal wells and 69 oil/gas wells within 10 miles of Segment E. The nearest mine is more than 1.5 miles from the segment; therefore, no impact is anticipated. Four wells are located within about 1,000 feet of the segment; two are water wells (Federal N6509 No. 1 and No. 2). Two of the wells are oil/gas/water wells: Foreland-North Blackburn Federal No. (oil), and Stage Line Unit No. 1-A (oil/gas/water). Because the separation from the transmission line Segment is substantial, no impact is anticipated. The other wells are more distant and no impact would be anticipated.

Summary Comparison of Route Alternatives

TABLE 3.1-2: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Geo-1: Construction on Steep or Unstable Slopes	X	X	X	X	X
Impact Geo-2: Construction in Seismic Hazard Areas	X	X	X	X	X
Impact Geo-3: Construction in Problematic Soils	X	X	X	X	X
Impact Geo-4: Potential Interference with Mining	X	X	X	X	X
Impact Geo-5: Potential Conflicts with Cortez Gold Mine (Segment B)	X	X			

RESIDUAL IMPACTS

After implementing mitigation measures, minor residual impacts would remain. Hazards related to unstable slopes and earthquakes would remain and could damage the proposed facilities. Mitigation proposed by SPPC and in this EIS is directed to achieving an acceptable level of risk, meaning that additional regulatory action would not be required to ensure public safety and to achieve the objectives of the project. Implementation of the project would result in minor permanent topographic alteration related to construction activities; however, the impact would be less-than-significant because the proposed changes themselves are relatively small.

NO ACTION ALTERNATIVE

Under the No Action Alternative, potential project impacts related to geologic conditions, locatable and leasable minerals, and geothermal resources would not occur. However, similar impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

3.2 SOILS

This section identifies the existing soil characteristics in the study area and describes the potential impacts of the project, as well as mitigation measures to reduce these impacts.

3.2.1 AREA OF ANALYSIS AND METHODOLOGY

This section addresses soils within the study corridor and discusses the potential constraints posed by soils during construction, operation, and maintenance of the Falcon to Gonder project. The area of analysis for soil resources consists of a 500-foot-wide corridor (250 feet on each side of the centerline) along the five route alternatives.

The term "soil" has many definitions. Soil scientists usually consider soil as any medium for plant growth. As used in this report, soil is defined as a natural body consisting of layers or horizons of minerals and/or organic constituents of variable thickness, which differ from the parent material in their morphological, physical, chemical, and mineralogical properties as well as their biological characteristics. Topography, or local relief, controls much of the distribution of soils in the landscape, to such an extent that soils of markedly contrasting morphologies and properties can merge laterally with one another and yet be in equilibrium under existing local conditions (Birkeland 1984).

The primary source of information for soils within the project area was obtained from the Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) of the U.S. Department of Agriculture (USDA). Both published and digital soil survey maps (Soil Survey Geographic [SSURGO] Database) were available for the study corridor. The soil surveys applicable to the project study area include the following:

- Soil Survey of Diamond Valley Area, Nevada (NRCS 1980a);
- Soil Survey of Tuscadora Mountain Area, Nevada (NRCS 1980b);
- Soil Survey of Elko County Area, Nevada Central Part (NRCS 1997);
- Soil Survey of Eureka County Area, Nevada (NRCS 1989);
- Soil Survey of Lander County Area, Nevada North Part (NRCS 1992); and
- Soil Survey of Western White Pine County Area, Nevada (NRCS 1998).

The NRCS has mapped and delineated soils within the project area into soil series and soil map units. According to the NRCS, the objective of soil mapping is not to delineate pure taxonomic classes but to separate the landscape into segments with similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, on-site investigations may be needed to precisely define and locate the soils and miscellaneous areas. Most of the mapped areas within the soil surveys generally represent associations of two or three soil components (NRCS 1997).

Soils within the study corridor were analyzed based on seven soil constraint factors (high water erosion hazard, steep slopes, shallow depth to bedrock, high water table, coarse to very coarse soil texture, salinity/alkalinity problems, and high shrink/swell potential), which are relevant in assessing potential construction impacts and reclamation after construction. These major climatic, biological, physical, and chemical constraints for soils within the study area were collected from NRCS soil descriptions and soil management characteristics. To compare relative potential impact quantities among route alternative segments, the soil constraint groups occurring along the transmission line centerline and substation facilities were quantified in linear miles. Soils were not quantified along existing access roads to be

improved as part of the project, spur roads to be constructed, nor staging areas, since the exact locations of these appurtenant facilities are unknown at this time. The characteristics of soils along new spur roads and existing access roads are within the range of soil characteristics and constraints found in the study corridor.

Major Land Resource Area (MLRA) descriptions (NRCS Areas 24, 25, 28B) for the Humboldt, Owyhee High Plateau, and Central Nevada Basin and Range were used together with Ecological Status Inventory (ESI) data from the BLM's Elko, Ely, and Battle Mountain Field Offices to identify plant community types that can occur within a soil or ecological site complex in the project area. A list of MLRA Range Sites, including correlated plant community types, potentially found in the project area is included as Appendix 1 in the SEI and Tetra Tech EMI (2000), Vegetation Survey report. Plant community types are described in Section 3.4, Vegetation.

REGULATORY FRAMEWORK

National Pollutant Discharge Elimination System Permit

The NDEP administers the federal EPA promulgated regulations (55 CFR 47990) requiring the permitting of stormwater-generated pollution under the National Pollutant Discharge Elimination System (NPDES). Pursuant to these federal regulations, an operator must obtain a General Permit under the NPDES Stormwater Program for all construction activities of 5 acres or greater. The General Permit requires the implementation of Best Management Practices (BMPs) to reduce pollutant loads into the waters of the state.

Nevada Best Management Practices (BMPs)

The use of BMPs in Nevada is addressed in the Handbook of Best Management Practices published by the State of Nevada Environmental Commission (1994). The handbook references two definitions of BMPs. EPA guidelines define BMPs as "methods, measures, or practices to prevent or reduce water pollution, including but not limited to, structural and non-structural controls, operation and maintenance procedures and scheduling and distribution of activities. Usually BMPs are applied as a system of practices rather than a single practice. BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility." Nevada Administrative Code 445.200 defines "Best Practices" as "measures, methods, or operation or practice that are reasonably designed to prevent, eliminate, or reduce water pollution from diffuse sources and that are consistent with the best practices in the particular field under the conditions applicable. This term is intended to be equivalent to the term 'best management practices' as used in federal statures and regulations."

3.2.2 AFFECTED ENVIRONMENT

GEOLOGIC HISTORY

The landscape of the Basin and Range province is dominated by isolated mountain ranges rising abruptly from broad, alluvium-filled desert basins that include erosional stream valleys and dissected plateaus.

The general term "alluvial plains" has been used to broadly encompass the entire piedmont slope and basin floor, with the exception of the playa. The basin floors and piedmont slopes are complex, but the mountain fronts may be deeply embayed by alluvium-filled valleys, some of which open into intramontane basins. These mountain valleys contain landforms similar to those of the great piedmont slopes.

The piedmont slopes are largely comprised of a few major landforms—mountain valley fans, fan piedmonts, alluvial fans, and alluvial plains—that were largely constructed during the Pleistocene time or earlier. Since about mid-Pleistocene time, these particular landforms have been modified by recurrent erosion and deposition cycles, separated by periods of stability and soil formation. Only parts of these major landforms were cut away by periodic erosion or buried by periodic sedimentation during each of the cycles. Thereby, smaller component landforms, their landform elements, and their slope components have created these major landforms. This resulted in a mosaic of old, remnant land surfaces and relatively young land surfaces that more nearly accord with individual soils than these major landforms. Several other landforms, including ballenas, fan skirts, beach plains, and playas, were themselves created by the cycles of erosion and deposition. They have been left largely intact by the latest cycles so that they also accord fairly well with soils.

SOIL CHARACTERISTICS

Soil survey mapping generally organizes soils into soil series and soil map units. The soil series is the lowest category of the national soil classification system and is the most homogeneous class in the system of taxonomy. The name of a soil series is the common reference term, used to name soil map units. Soil map units typically represent associations of two or three major soil components, as well as inclusionary soils. Soil patterns commonly coincide with landforms and physiographic positions but may occur across multiple features.

Palinor, Tenabo, Pineval, and Rubyhill soils are the predominant soil series occurring in the study area. Together, these soils occur on approximately 75 miles of the transmission centerline, or roughly 20% of the study area. A brief description of the predominant soil series is provided below. Other soil types in the study area are detailed in a separate Technical Memorandum (EDAW 2001).

Palinor Series

The Palinor series consists of well-drained soils formed in alluvium dominantly from limestone and other calcareous sources. They typically have moderate permeability, an available water capacity of 1 to 4 inches, and a low to moderate shrink-swell potential. Palinor series soils are shallow, with a depth to duripan of 14 to 20 inches and a depth to seasonal high water table of more than 60 inches. Slopes vary from 2 to 50%; thus, runoff ranges from slow to rapid. The hazard of water erosion is slight to moderate, but there is only a slight wind erosion hazard. The content of rock fragments ranges from 45 to 75% pebbles and 0 to 5% cobbles. The dominant vegetation is mainly black sagebrush, bottlebrush squirreltail, spiny hopsage, and ephedra. Soil map units in the study area that are characterized by Palinor series soils include "Palinor very gravelly loam, 2 to 15% slopes," and "Palinor-Urmafoot-Palinor, steep association." Palinor series soils are generally found in the White River Valley of White Pine County, Nevada.

Tenabo Series

The Tenabo series consists of well-drained soils that are formed in a thin loess mantle high in volcanic ash over alluvium from mixed rocks. They typically have moderately slow permeability, a low available water capacity, and a low to moderate shrink-swell potential. Tenabo series soils are shallow with a depth to duripan of 9 to 20 inches and a depth to seasonal high water table of more than 20 inches. Slopes vary from 0 to 30%; thus, runoff ranges from very slow to medium. However, some map units do have rapid runoff. The hazard of water erosion varies from slight to high, but there is only a slight wind erosion hazard. The content of rock fragments is less than 20%, when mixed. The dominant vegetation is mainly shadscale, bud sagebrush, cheatgrass, bottlebrush squirreltail, and Sandberg's bluegrass. Soil map units in the study area characterized by Tenabo series soils include "Tenabo cobbly silt loam, 2 to 15% slopes," "Tenabo association," and "Tenabo-Ricert association." Tenabo series soils are generally found in the near the town of Beowawe in Eureka County, Nevada.

Pineval Series

The Pineval series consists of well-drained soils that formed in alluvium derived from volcanic or mixed rocks. They typically have moderately slow permeability, a low available water capacity (up to 12.6 inches due to soil association), and a low shrink-swell potential. Pineval series soils are very deep with a depth to seasonal high water table of more than 60 inches. Slopes vary from 2 to 30%; thus, runoff ranges from medium to very rapid. The hazard of water and wind erosion are both slight. The content of rock fragments range is 35 to 60% pebbles. The dominant vegetation is mainly Wyoming big sagebrush, Douglas rabbitbrush, Thurber's needlegrass, Sandberg's bluegrass, and bottlebrush sqirreltail. Soil map units in the study area characterized by Pineval series soils include "Pineval-Tulase-Perwick association." Pineval series soils are generally found south of the town of Carlin in Elko County, Nevada.

Rubyhill Series

The Rubyhill series consists of well-drained soils that formed in alluvium from mixed rock sources. They typically have moderate permeability and a low available water capacity. Rubyhill series soils are moderately deep with an effective rooting depth and depth to duripan of 20 to 30 inches. Slopes vary from 0 to 8%; thus, runoff is slow to medium. The hazard of erosion is slight. The content of rock fragments range from 5 to 35% gravel. The dominant vegetation is mainly big sagebrush, Sandberg's bluegrass, and occasionally pinyon and juniper. Soil map units in the study area that are characterized by Rubyhill series soils include "Rubyhill fine sandy loam, 2 to 8% slopes." Rubyhill series soils are found in the Kobeh Valley of Eureka County, Nevada.

3.2.3 ENVIRONMENTAL CONSEQUENCES

This section contains a discussion of the potential impacts of the project as it relates to soil resources and reclamation/revegetation suitability; also provided are mitigation measures to reduce these impacts to a less-than-significant level. The significance criteria for assessing impacts are described below.

SIGNIFICANCE CRITERIA

For the purpose of this Draft EIS, project construction, operation, and maintenance activities would have a significant impact to soils and reclamation/revegetation efforts if they would:

- Substantially increase erosion along the transmission line corridor, access and spur roads, or around associated facilities;
- Substantially affect downstream resources by erosion and sedimentation;
- Substantially increase soil compaction; and/or
- Substantially decrease the potential or time period for revegetation/reclamation success.

SOIL CONSTRAINT GROUPS

Seven soil constraint groups were established to identify soils that may impede construction, operation, maintenance, and reclamation activities associated with the project. These soil groups are described below. A detailed table of soil constraints by soil series and soil map unit is contained in a Technical Memorandum (EDAW 2001), available at the Elko, Ely, and Battle Mountain BLM field offices. Approximately 29% of the study corridor is generally free of any of soil constraints (see Figures 3.2-1 and 3-1). However, soils generally free of constraints still may possess small problem areas that could impede reclamation or other project activities. Such areas will be identified prior to construction and reclamation, and included in the COM Plan.

Sierra Pacific Power Co.

FALCON to GONDER Project

Areas with No Reclamation Constraints

No Constraints

Soil Constraint Groups (not shaded) include:

Water Erosion Hazard > 8
Slope > 15%
Depth to Water < 6 feet
Depth to Bedrock < 20 inches
Texture > 35% Gravel, Cobble, or Stone
Salinity > 4 mmhos/cm
Alkalinity = pH 8.5 or greater
Shrink Swell Potential = Moderate or High
Hydric Properties = Yes

TRANSMISSION LINES

Route Alternatives

Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco 04/25/01

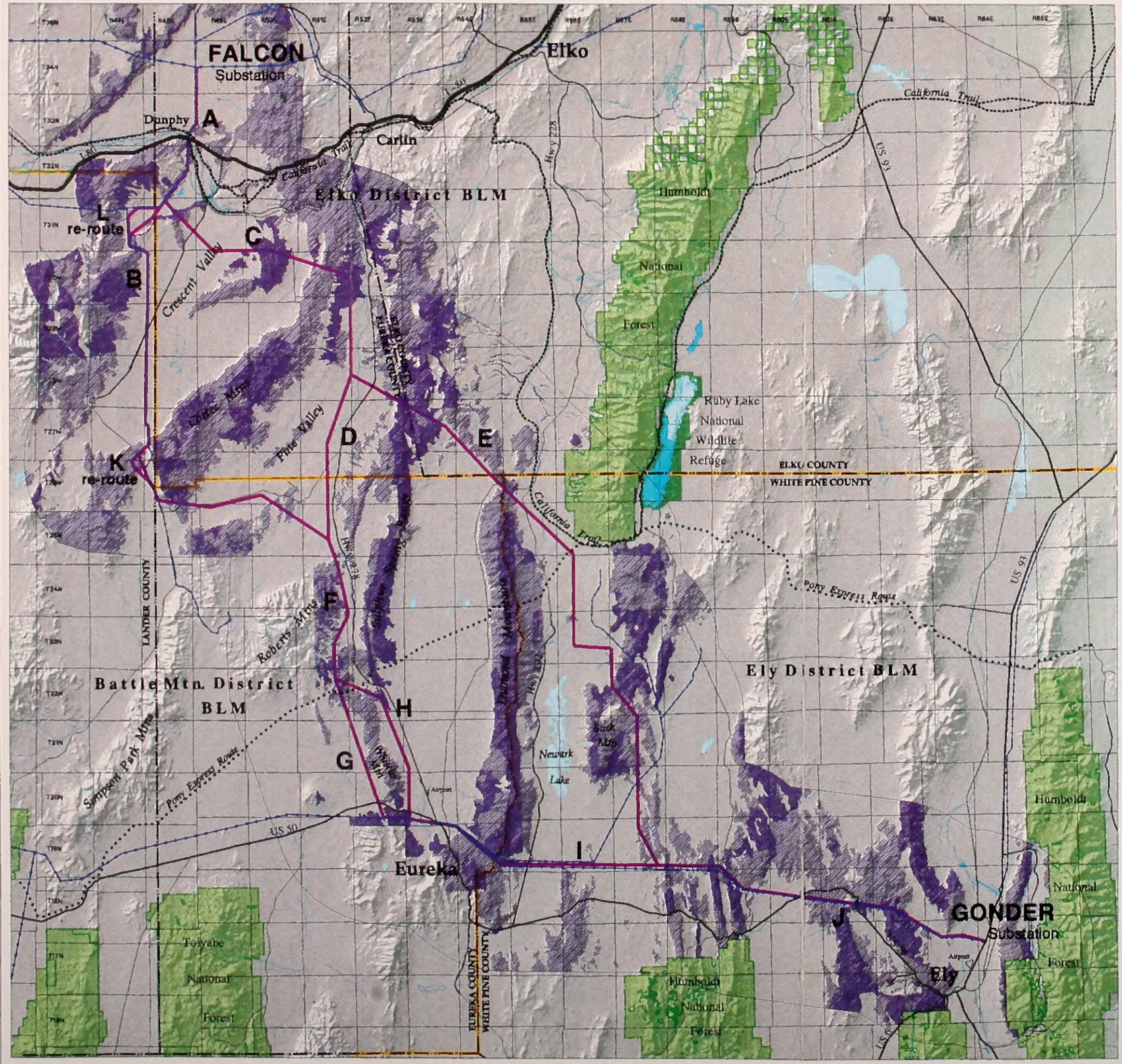
SOURCES: USDA —NRCS Soil Surveys / USGS —DEM

Figure 3.2 - 1

Sierra Pacific Power Co.

FALCON to GONDER Project

Areas with Steep Slope and High Water Erodibility



Slope and Erodibility Factors

- Steep Slope (>15 %)
- Steep Slope and Severe Erodibility (>8)

TRANSMISSION LINES

- Route Alternatives
- Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

N

GIS Mapping by **EDAW, Inc.** — San Francisco

04/25/01

SOURCES: USDA —NRCS Soil Surveys / USGS —DEM

Figure 3.2 - 2

Group 1 - High Water Erodibility

Erosion factors are used to predict the erodibility of soils and its tolerance to erosion when subject to certain kinds of construction activities and land uses. The water erosion factor was utilized to evaluate the soils within the project area. According to the NRCS, most soils in the project area are not subject to high wind erosion (personal communication with Tom McKay, NRCS, June 2000). Based on NRCS recommendations for calculating erosion potential in Nevada, the water erosion potential of a given soil map unit was calculated as the product of the "K" factor, or the "soil erodibility index" and the percent slope (personal communication with Tom McKay, NRCS, June 2000). Based on NRCS established ratings, water erosion potential was considered to be high if it was greater than 8 (personal communication with Tom McKay, NRCS, June 2000). Soils with a high water erosion potential are characterized by steep slopes, rapid water runoff, exposed rock, sparse vegetation, and noncohesive materials easily transported by water. Soils with a high water erosion hazard rating occur over approximately 9.4% of the study corridor (see Figures 3.2-1 and 3.2-2). The most common soil series exhibiting severe water erosion hazard are Pookaloo, Hopeka, Toeja, Bartine, Atrypa, Creva, Bucan, and Malpais. Additionally, soils in recently burned areas (see Figure 3.4-1 in Section 3.4, Vegetation) have increased erosion potential until vegetative cover is re-established. Fire can also change the chemical structure of some soils, causing them to crystallize and making revegetation more difficult.

Group 2 - Steep Slopes

Slopes greater than 15% are considered moderately steep and could present problems during revegetation (e.g., poor seed retention or insufficient soil moisture). Steep slopes are generally associated with shallow soils in mountainous areas. Soils with a slope greater than 15% occur over approximately 28.1% of the study corridor (see Figures 3.2-1 and 3.2-2). The most common soil series exhibiting steep slopes are Pookaloo, Segura, Atlow, Tenabo, Atrypa, Hopeka, Toeja, Bucan, Cyan, and Perwick.

Group 3 - Shallow Depth to Bedrock

Bedrock is the solid material that underlies the soil and other unconsolidated material. Soils with shallow bedrock are defined as those where bedrock is located within 15 inches of the soil surface. This soil characteristic occurs over approximately 16.5% of the study corridor. It is generally associated with less developed soils in the mountainous areas. The most common soil series exhibiting a shallow depth to bedrock are Pookaloo, Segura, Atlow, Atrypa, Hopeka, Genaw, Chen, Upatad, Tecomar, and Creva.

Group 4 - High Water Table

Soils with a high water table are characterized by a water table typically within 6 feet of the soil surface. Soils with a high water table can be subject to deep rutting and compaction by construction activities when wet. High water tables are generally associated with soils in the alluvial valleys. This soil characteristic occurs over approximately 2.1% of the study corridor. The most common soil series exhibiting a high water table is Ocala.

Group 5 – Coarse to Very Coarse Soil Texture

Soils with coarse to very coarse textures are those that include 15 to 35% by volume of coarse fragments (with particle size $\geq$ 2 mm in diameter) including gravels, cobbles, and stones at the surface or within the soil profile. Soils with coarse to very coarse soil textures can be a constraint to revegetation efforts due to insufficient soil moisture. These soils are generally associated with soils in alluvial valleys and footslopes of the mountain range areas. This soil characteristic occurs over approximately 56.8% of the study corridor. The most common soil series exhibiting coarse to very coarse soil texture are Palinor, Tenabo, Pineval, Perwick, Pookaloo, Yody, Segura, Atlow, Ratto, and Whirlo.

Group 6 - Salinity or Alkalinity Problems

Both saline and alkaline soils can stunt plant growth. A saline soil contains soluble salts in amounts that could impair the growth of plants. It is generally associated with soils in the alluvial valley areas. Saline soils occur over approximately 8% of the study corridor. The most common soil series exhibiting salinity problems are Ocala, Batan, Sheffit, Beowawe, Dunphy, Broyles, Wholan, and Rosney. An alkaline soil has a high degree of alkalinity (pH 8.5 or higher) and/or a high percentage of exchangeable sodium (15% or more of the total exchangeable bases). Alkaline soils occur over approximately 5% of the study corridor. The most common soil series exhibiting alkalinity problems are Ocala, Alhambra, Sheffit, and Dunphy.

Group 7 – High Shrink/Swell Potential

Soils with a high shrink/swell potential are characterized by a high clay content (greater than 40%) in the subsoil. These soils are prone to swelling when wet and shrinking when drying out. Soils with a moderate to high shrink/swell potential may create soil stability and drainage problems. Typically, these soils form deep cracks after drying out and have a greater potential for drainage problems and soil stability. This would primarily be a constraint during construction and revegetation activities within the project area. Soils with a moderate to high shrink/swell potential are generally found in alluvial valleys and footslopes of the mountains. Soils with a moderate shrink/swell potential occur over approximately 13.9% of the study corridor. The most common soil series exhibiting moderate shrink/swell potential are Ocala, Segura, Ratto, Atrypa, Bartine, Alhambra, Hodedo, Sheffit, Mau, and Coils.

ENVIRONMENTAL IMPACTS - COMPARISON OF ALTERNATIVES

Impacts Common to all Route Alternatives

The general construction, operation, and maintenance effects of the project on soil erosion and reclamation/revegetation efforts are related to efforts on other resources, such as vegetation resources, wildlife habitat, special status animal and plant species, and range resources. Construction, operation, and maintenance activities could result in substantial soil erosion and decrease the success of reclamation/revegetation through the following ground-disturbing activities:

- Excavation for towers and anchors;
- Blading and grading of soil for construction access and work areas at tower structure locations;
- Construction of new spur roads and improvement of existing access roads;
- Temporary stockpiling of soil or construction materials and sidecasting of soil and vegetation;
- Use of designated equipment staging areas;
- Soil compaction and dust; and/or
- Equipment access through nonsensitive stream channels (defined as streams that do not support sensitive species, critical habitat, or woody riparian vegetation).

Table 3.2-1 summarizes the characteristics of the seven soil groups discussed above in terms of potential project-related impacts and constraints. The following is an analysis of potential soil-related impacts common to all route alternatives (i.e., irrespective of segment or alternative), as well as mitigation measures that would reduce these impacts to a less-than-significant level. An analysis of soil groups occurring within each of the route alternatives follows.

❑ ***Impact Soil-1: Increased Soil Compaction and Rutting in the Transmission Line Corridor and Around Substations During Construction, Operation, and Maintenance of the Project***

Soils with a high water table and high clay content are susceptible to deep rutting and compaction by vehicles and heavy equipment when wet. Soils with a high clay content are also susceptible to deep crack formation along created ruts when soils dry out. Compacted, rutted, or cracked soils can hinder or delay re-establishment of vegetation and success in reclamation objectives. Because the extent of this impact is expected to be limited, this impact is considered adverse but less-than-significant. However, implementation of the following mitigation measure would reduce the effects to these soil constraint groups.

TABLE 3.2-1: POTENTIAL PROJECT-RELATED IMPACTS OF THE SOIL GROUPS ANALYZED

Soil Constraint Group	Stage of Project	Potential Impacts/ Constraints
High Water Erodibility	Construction, Operation, Maintenance, Reclamation	Loss of topsoil and sedimentation of downstream resources.
Steep Slope	Reclamation	Insufficient water availability to the root zone and difficult to retain seeds on slope.
Shallow Bedrock	Reclamation	Plant rooting depth and available water may be restricted.
High Water Table	Construction, Operation, Maintenance, Reclamation	Deep rutting and compaction from equipment.
Coarse to Very Coarse Soil Texture	Reclamation	Poor water retention for seed germination and plant establishment.
Saline/Alkaline Soils	Reclamation	Low water nutrient availability to plants, which could result in plants with stunted roots and withered leaves.
High Shrink/Swell Potential	Construction, Operation and Maintenance	Soil stability and drainage problems.

❑ ***Mitigation Measure Soil-1***

Construction, operation, and maintenance activities will be restricted when the soil is too wet to adequately support construction or maintenance equipment (i.e., when heavy equipment creates ruts in excess of 4 inches deep over a distance of 100 feet or more in wet or saturated soils). This standard would not apply in areas with silty soils, which easily form depressions even in dry weather. Where the soil is deemed too wet, one or more of the following measures would apply:

(a) When feasible, re-route all construction or maintenance activities around the wet areas so long as the route does not cross into sensitive resource areas.

(b) If wet areas cannot be avoided, implement BMPs for use in these areas during construction and improvement of access roads, and their subsequent reclamation. This includes use of wide-track or balloon-tire vehicles and equipment, or other weight dispersing systems approved by the appropriate resource agencies. It also may include use of geotextile cushions, pre-fabricated equipment pads, and other materials to minimize damage to the substrate where determined necessary by resource specialists. If BMPs cannot be successfully applied to wet or saturated soil areas, construction or routine maintenance activities would not be allowed in these areas until the project environmental monitor(s) determine it is acceptable to proceed.

(c) Limit access of construction equipment to the minimum amount feasible, remove and separate topsoil in wet or saturated areas, and stabilize subsurface soils with a combination of one or more of the following: grading to dewater problem areas, utilize weight dispersion

mats, and maintain erosion control measures such as surface rilling and back-dragging. After construction is complete, re-grade and re-contour the area, replace topsoil, and reseed to achieve the required plant densities.

(d) Compensate for increased impacts on soils: If equipment creates excessive ruts in wet or saturated soils as determined by the project environmental monitors, and these areas require supplemental dewatering, stabilization, erosion control, and reclamation measures to continue construction during wet conditions, increased impacts on soils and vegetation would be mitigated by restoration and preservation of disturbed soils and vegetation communities off-site. The restoration and/or preservation would take place off-site in the project area at a ratio to be determined in consultation with the BLM and SPPC. The final acreage for compensation would be determined by quantifying the post-construction disturbance area and condition. Even though it is not considered a significant impact, a compensation ratio of 1:1 off-site is proposed to mitigate for any increased permanent or temporary impacts to soils and vegetation related to continuing construction during wet conditions. This mitigation measure would be in addition to the on-site reclamation of the soil and vegetation disturbed by construction activities during wet conditions.

❑ ***Impact Soil-2: Delayed or Reduced Reclamation Success Due to Project Activities on Coarse to Very Coarse Textured Soils, Alkaline/Saline Soils, or Soils with Shallow Depth to Bedrock***

Coarse to very coarse textured soils, soils with shallow depth to bedrock, and alkaline/saline soils have characteristics that could delay or reduce reclamation success along the transmission line corridor or around substations. Coarse to very coarse textured soils have a low water holding capacity. Under these conditions, successful seed germination may be difficult due to the lack of water in the soil profile. Soils with a shallow depth to bedrock typically have insufficient water availability and a restricted root zone within the soil profile. It may be difficult for shrub species to develop under these conditions. Alkaline/saline soils can hinder seed germination and are often too toxic for all but alkaline/saline-adapted plants. Plant communities adapted to these conditions are regionally abundant and the relative extent of impacts to these communities would be small. Therefore, this impact would be adverse but less-than-significant. However, the following mitigation measure would reduce the effects to these soil constraint groups.

❑ ***Mitigation Measure Soil-2***

Vegetation removal and soil disturbances (including temporary road improvements) will be minimized in areas where soil constraints occur. Where vegetation removal is required, mowing or cutting will be the primary method utilized. Plants would generally be cut at a height that results in the least damage to the root crown during cutting or subsequent damage by vehicles and equipment. Blading will be restricted except when required for safe equipment operation (e.g., inability to operate a crane on a side hill). Previously located environmental constraint areas would be delineated in the field by a qualified resource specialist prior to construction and included in the COM Plan. These environmental constraint areas would then be avoided by construction activities, or mitigation would be applied consistent with measures described in this EIS.

❑ ***Impact Soil-3: Construction on Expansive Soils (High Shrink/Swell Potential)***

Expansive soils (i.e., with a high shrink/swell potential) are scattered throughout the transmission line corridor. Structural foundations associated with the transmission lines would generally be below the 4-foot zone, which would not be affected by expansive soils. However, substation foundations could be significantly impacted by the presence of expansive soils. Geotechnical studies prepared for the project will identify areas of expansive soils. The implementation of the following mitigation measure would ensure that construction on expansive soils would result in a less-than-significant impact.

❑ ***Mitigation Measure Soil-3***

Prior to construction, soils will be evaluated to determine if they are expansive and if they may have potential effects on the proposed facilities. Where they represent a potential hazard, solutions recommended by the project's geotechnical engineer, such as excavation and replacement of the expansive soils with compacted backfill, would be required. If imported backfill material is used, it would be certified to be free of noxious weeds and propagules (i.e., seeds and root fragments).

❑ ***Impact Soil-4: Increased Soil Erosion in the Transmission Line Corridor and Associated Facilities During Construction, Operation, and Maintenance of the Project***

Construction of the project could result in surface disturbances and removal of vegetation along the transmission line corridor and around substation facilities, leading to increased soil erosion. Sedimentation into streams and water bodies would likely increase if disturbed soils were left exposed during winter, early spring, and summer storm events (periods of high precipitation, runoff, and winds). Erosion potential is generally more severe on steep, sparsely vegetated slopes, fine sandy or silty soils, and in loose sandy soils where strong winds occur. Erosion potential is also elevated in recently burned areas (i.e., 1999 or subsequently) so long as they remain largely unvegetated, especially in areas with high erosion potential. Soil erosion is expected to be minimal following successful reclamation of disturbed areas. Because the areas where erosion may be increased are narrow and spread over a large area, this impact would be less-than-significant. However, the following mitigation measure would reduce erosion impacts.

❑ ***Mitigation Measure Soil-4***

The objectives of this mitigation measure are to reduce short-term erosion and sedimentation, as well as quickly restore topography and vegetation to pre-construction conditions in all areas required and approved by BLM and private landowners. A qualified resource specialist would monitor implementation during construction and operations, until successful revegetation is achieved (see "Restoration Success Criteria" in Appendix E: Reclamation Plan). Monitoring of the erosion control measures would continue until reclamation efforts were considered complete and successful. Measures to be implemented by the project proponent during project construction and reclamation are listed below.

- Implementation of the following environmental protection practices would minimize the effects of grading, excavation, and other surface disturbances in all project areas. Schedules and specifications on the use of these features would be included in the COM plan.
    - Confine all vehicular traffic associated with construction to the 500-foot study corridor, material yards, wire set-up sites, access roads, and helicopter fly yards designated in the COM Plan.
    - Limit disturbance of soils and vegetation disturbance removal to the minimum area necessary for access and construction.
    - Where vegetation removal is necessary, use cutting/mowing methods instead of blading, wherever possible, as described in Mitigation Measure Soil-2.
    - Adhere to a construction methodology that mitigates impacts to less-than-significant levels in sensitive areas during severe weather events (see Mitigation Measure Soil-1).
    - Inform all construction personnel before they are allowed to work on the project of environmental concerns, pertinent laws and regulations, and elements of the erosion control plan. This could be presented in a multi-hour environmental training for

project management and general foremen, and a short (one hour or less) environmental training class for construction personnel.

- Minimize grading. When required, grading should be conducted away from watercourses to reduce the risk of material entering the watercourse.
- Graded material should be sloped and bermed where possible, to reduce surface water flows across the graded area.
- Replace excavated materials in disturbed areas and minimize the time between excavation and backfilling.
- Direct the dewatering of excavations onto stable surfaces to avoid soil erosion.
- Use detention basins, certified weed-free straw bales, or silt fences where appropriate.
- Use drainage control structures, where necessary, to direct surface drainage away from disturbance areas and to minimize runoff and sediment deposition downslope from all disturbed areas. These structures include culverts, ditches, water bars (berms and cross ditches), and sediment traps.
- Implement other applicable BMPs to minimize erosion-related impacts, during construction and improvement of access roads, and their subsequent reclamation.

- In areas of highly erodible soils, non-standard construction equipment and techniques that minimize surface disturbance, soil compaction, and loss of topsoil would be used, such as vehicles with low ground pressure tires, or helicopters when feasible and practicable. Vegetation clearing should be minimized. Temporary erosion control measures, in accordance with the Soil Conservation and Erosion Control Plan, will be installed before construction is allowed to proceed in potential soil erosion areas (e.g., steep slope areas). Erodible slopes that do not require grading should be cleared using equipment that results in little to no soil disturbance.
- Re-establish native and, if necessary, non-persistent, non-invasive, non-native vegetation cover in highly erodible areas as quickly as possible following construction.

Alternative-Specific Impacts

The following is an analysis of soil groups occurring within each of the route alternatives, potential soil-related impacts, and mitigation measures that would reduce these impacts, if significant, to a less-than-significant level. The linear miles of soil groups that occur along the proposed transmission line centerline and substation facilities are summarized by alternative in Table 3.2-2.

As evident in Table 3.2-2, there is very little distinction among the five alternatives based on soils-related constraints. The seven soils constraint groups occur to some degree in each of the five route alternatives; in most cases, the linear mileage associated with potential constraints is similar from alternative to alternative. In addition, there are no alternative- or segment-specific impacts (and associated mitigation measures) that occur; all soils impacts and related mitigation measures are addressed in impacts common to all route alternatives, as described in the previous section (Impact Soil-1 through -4). Because of these similarities, a segment-by-segment analysis is not warranted in the context of this EIS analysis; the subtle distinctions among the five route alternatives are described below.

TABLE 3.2-2: MILES OF SOIL CONSTRAINT GROUPS CROSSED BY THE TRANSMISSION LINE AND SUBSTATION

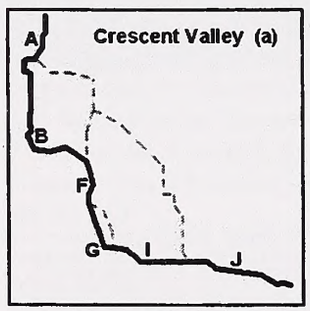
Route	Total Miles	No Reclamation Constraints	#1 High Water Erodibility	#2 Steep Slope	#3 Shallow Bedrock	#4 High Water Table	#5 Coarse to Very Coarse Soil Texture	#6a Saline Soils	#6b Alkaline Soils	#7 High Shrink/Swell Potential
Crescent Valley										
(a)	185.9	56.2	14.8	55.5	29.7	4.4	106.7	17.1	9.6	28.3
(b)	186.4	49.3	12.3	55.0	27.5	4.1	112.0	17.5	10.9	29.8
Pine Valley										
(a)	179.1	57.7	24.1	58.7	29.7	3.3	93.6	16.3	8.5	25.2
(b)	179.5	50.8	21.6	58.3	27.4	3.0	99.0	16.7	9.8	26.7
Buck Mountain										
	167.3	30.5	21.7	60.1	41.3	3.0	107.7	13.0	8.8	17.7

The seven soil constrain groups include::

#1 water erosion hazard rating of severe; #2 slopes greater than 15%; #3 less than 15 inches to bedrock; #4 seasonal high water table within 6 feet of the soil surface; #5 particle size greater than or equal to 2 mm in diameter (15 to 35% by volume of rock fragments).; #6a electrical conductivity of a saturated extract greater than 4 µmhos/cm; #6b pH of 8.5 or greater; #7 shrink/swell potential of moderate or high

Source: NRCS 1980a, NRCS 1980b, NRCS 1989, NRCS 1992, NRCS 1997, NRCS 1998, and EDAW 2000

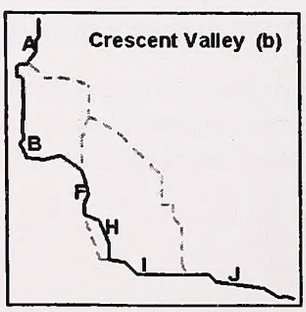
Crescent Valley (a) Route Alternative



Crescent Valley (a) includes Segments A, B, F, G, I, and J. Crescent Valley (a) is approximately 185.9 miles long. Within the route alternative, the following soil constraints would be encountered: 106.7 linear miles of coarse to very coarse soil textured soils, 55.5 linear miles of soils with slopes greater than 15%, 17.1 linear miles of saline soils, 9.6 linear miles of alkaline soils, 4.4 linear miles of soils with high water table, 28.3 linear miles of soils with high shrink/swell potential, 14.8 linear miles of soils with a high water erosion hazard rating, and 29.7 linear mile of soils with shallow depth to bedrock. Approximately 56.2 linear miles (30%) of the Crescent Valley (a) route alternative have no reclamation constraints (i.e., are generally not characterized by any of the seven soil constraint groups). Note that this route alternative has the highest mileage of soils with a high water table.

Construction, operation, and maintenance of project can result in impacts described in Impacts Soil-1 through Soil-4; these adverse impacts, though less-than-significant, will be reduced by implementing Mitigation Measures Soil-1 through Soil-4.

Crescent Valley (b) Route Alternative

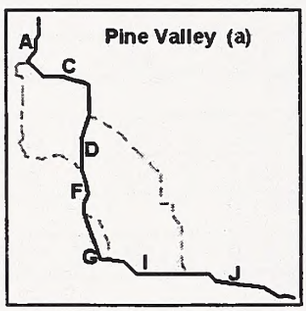


Crescent Valley (b) includes Segments A, B, F, H, I, and J. Crescent Valley (b) is approximately 186.4 miles long. Within the route alternative, the following soil constraints would be encountered: 112 linear miles of coarse to very coarse soil textured soils, 55 linear miles of soils with slopes greater than 15%, 17.5 linear miles of saline soils, 10.9 linear miles of alkaline soils, 4.1 linear miles of soils with high water table, 29.8 linear miles of soils with high shrink/swell potential, 12.3 linear miles of soils with a high water erosion hazard rating, and 27.5 linear mile of soils with shallow depth to bedrock. Approximately 49.3

linear miles (26%) of the Crescent Valley (b) route alternative have no reclamation constraints (i.e., are generally not characterized by any of the seven soil constraint groups). Note that this route alternative has the highest mileage of soils with coarse soil texture, saline soils, alkaline soils, and high shrink/swell potential, as well as the least mileage of soils with a high water erodibility or steep slopes.

Construction, operation, and maintenance of project can result in impacts described in Impacts Soil-1 through Soil-4; these adverse impacts, though less-than-significant, will be reduced by implementing Mitigation Measures Soil-1 through Soil-4.

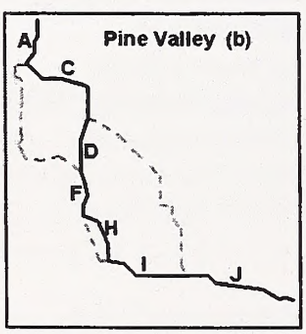
Pine Valley (a) Route Alternative



Pine Valley (a) includes Segments A, C, D, F, G, I, and J. Pine Valley (a) is approximately 179.1 miles long. Within the route alternative, the following soil constraints would be encountered: 93.6 linear miles of coarse to very coarse soil textured soils, 58.7 linear miles of soils with slopes greater than 15%, 16.3 linear miles of saline soils, 8.5 linear miles of alkaline soils, 3.3 linear miles of soils with high water table, 25.2 linear miles of soils with high shrink/swell potential, 24.1 linear miles of soils with a high water erosion hazard rating, and 29.7 linear mile of soils with shallow depth to bedrock. Approximately 57.7 linear miles (32%, the highest constraint-free mileage of any route alternative) of the Pine Valley (a) route alternative have no reclamation constraints (i.e., are generally not characterized by any of the seven soil constraint groups). Note that this route alternative has the highest mileage of soils with high water erodibility, as well as the least mileage of soils with coarse texture and alkaline soils.

Construction, operation, and maintenance of project can result in impacts described in Impacts Soil-1 through Soil-4; these adverse impacts, though less-than-significant, will be reduced by implementing Mitigation Measures Soil-1 through Soil-4.

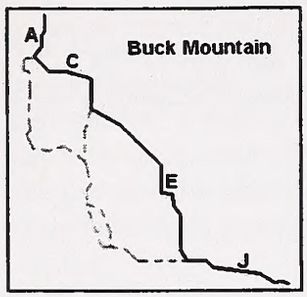
Pine Valley (b) Route Alternative



Pine Valley (b) includes Segments A, C, D, F, H, I, and J. Pine Valley (b) is approximately 179.5 miles long. Within the route alternative, the following soil constraints would be encountered: 99 linear miles of coarse to very coarse soil textured soils, 58.3 linear miles of soils with slopes greater than 15%, 16.7 linear miles of saline soils, 9.8 linear miles of alkaline soils, 3 linear miles of soils with high water table, 26.7 linear miles of soils with high shrink/swell potential, 21.6 linear miles of soils with a high water erosion hazard rating, and 27.4 linear mile of soils with shallow depth to bedrock. Approximately 50.8 linear miles (28%) of Pine Valley (b) have no reclamation constraints (i.e., are generally not characterized by any of the seven soil constraint groups). Note that this route alternative has the lowest mileage of soils with shallow depth to bedrock and high water table.

Construction, operation, and maintenance of project can result in impacts described in Impacts Soil-1 through Soil-4; these adverse impacts, though less-than-significant, will be reduced by implementing Mitigation Measures Soil-1 through Soil-4.

Buck Mountain Route Alternative



Buck Mountain includes Segments A, C, E, and J. Buck Mountain is approximately 167.3 miles long. Within the route alternative, the following soil constraints would be encountered: 107.7 linear miles of coarse to very coarse soil textured soils, 60.1 linear miles of soils with slopes greater than 15%, 13 linear miles of saline soils, 8.8 linear miles of alkaline soils, 3 linear miles of soils with high water table, 17.7 linear miles of soils with high shrink/swell potential, 21.7 linear miles of soils with a high water erosion hazard rating, and 41.3 linear mile of soils with shallow depth to bedrock. Approximately 30.5 linear miles (18%, the lowest constraint-free amount of any of the route alternatives) of Buck Mountain have no reclamation constraints (i.e., are generally not characterized by any of the seven soil constraint groups). Note that this route alternative has the highest mileage of soils with steep slopes and shallow bedrock, as well as the least mileage of soils with high water table, saline soils, and high shrink/swell potential.

Construction, operation, and maintenance of project can result in impacts described in Impacts Soil-1 through Soil-4; these adverse impacts, though less-than-significant, will be reduced by implementing Mitigation Measures Soil-1 through Soil-4.

Summary Comparison of Route Alternatives

TABLE 3.2-3: SUMMARY COMPARISON OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Soil-1: Increased Soil Compaction and Rutting in the Transmission Line Corridor and Around Substations During Construction, Operation, and Maintenance of the Project	X	X	X	X	X
Impact Soil-2: Delayed or Reduced Reclamation Success Due to Project Activities on Coarse to Very Coarse Textured Soils, Alkaline/Saline Soils, or Soils with Shallow Depth to Bedrock	X	X	X	X	X
Impact Soil-3: Construction on Expansive Soils (High Shrink/Swell Potential)	X	X	X	X	X
Impact Soil-4: Increased Soil Erosion in the Transmission Line Corridor and Associated Facilities During Construction, Operation, and Maintenance of the Project	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation and reclamation, residual impacts related to soils would be minor. Residual effects to soils would result primarily from temporary disturbances to soils and removal or reduction of vegetation. After reclamation, these impacts should minimal.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to existing soils resources associated with this project would not occur. However, soils-related impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

3.3 HYDROLOGY AND WATER RESOURCES

The project area is predominantly a high elevation desert; therefore, water resources are limited and of special importance. The protection of water resources is a primary concern to federal, state, and local government, as well as to residents. Additionally, the region presents some characteristic flood hazards that potentially could affect the positioning of transmission towers to avoid effects that would compromise the reliable operation of the line. This section describes the flood hazards and potential impacts to water resources.

3.3.1 AREA OF ANALYSIS AND METHODOLOGY

The area of analysis for hydrology and water resources includes the area within 2 miles of the transmission line route alternatives for surface water resources, springs and wells, and flood inundation hazard areas. For flash flood hazard, the project area includes the catchment area for stream segments crossed by the route alternatives.

The method of analysis was predominantly an interpretation of large scale (1:24,000) USGS topographic quadrangles to identify water resources and evaluate hazards. The project is not consumptive of water resources, except for a small demand for water to construct the foundations of transmission towers and water used for dust suppression during the construction phase. Therefore, detailed evaluations of available water supplies for the project were deemed unnecessary for the analysis.

REGULATORY FRAMEWORK

Water Supply

Water resources in the project area are regulated under federal, state, and local laws, regulations, and ordinances. Given the nature of the proposed facilities and the absence of a need for securing a long-term water supply for the project, water rights are not a significant issue for the project. The project is unlikely to conflict with existing water rights because it does not demand sustained use of water resources. The primary issue would be the potential for the project to impair access to a source of water, such as a water well or spring. However, given the leeway to site transmission towers and other facilities to avoid wells or other access to water resources, the project likely could proceed with minimal need to negotiate water rights with landowners or secure significant permits for use or diversion of waters. The Nevada Division of Water Resources (NDWR) requires approval of water rights for construction use of water by diversions from a stream or use of a well. Similarly, if dewatering is required for construction, a Waiver Request must be approved by NDWR. Applicable regulatory requirements are related primarily to protection of surface water resources and water quality. Water appropriation permits are issued by the Nevada State Engineer of the NDWR.

Clean Water Act

General water quality is protected under the federal Clean Water Act. As federal law, it applies to all parts and locations of the project in all its phases. Project construction would require securing a National Pollutant Discharge Elimination System (NPDES) permit pursuant to 40 CFR, Parts 122-124. The NPDES permit would be supported by the preparation of a Stormwater Pollution Prevention Plan (SWPPP) for construction of the facilities. The SWPPP would be comprised of BMPs for construction of the facilities. NDPES permits are administered by the NDEP.

Compliance with the federal Clean Water Act also would be required if the project would result in alteration of or discharges into watercourses and water bodies (Waters of the United States) and wetlands. The U.S. Army Corps of Engineers (USACE) and EPA regulate the placement of fill into

waters of the United States under Section 404 of the act. Waters of the United States include lakes, rivers, streams and their tributaries, and wetlands.

Wetlands are defined for regulatory purposes as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to grow in saturated soil (33 CFR 328.3, 40 CFR 230.3). For a wetland to qualify as jurisdictional by the USACE and therefore be subject to Section 404 regulation, the site must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology. Evidence of historic presence of wetlands that have since become degraded also may result in a Section 404 compliance requirement.

Waters of the United States in the project area include perennial and intermittent drainages that drain to navigable waters, such as flowing rivers, streams, and other drainage features with defined channel characteristics. The Sacramento District of the USACE would be responsible for issuing the permit. An individual permit for the project or a nationwide permit may be required at the discretion of the USACE and EPA. Consultation with the U.S. Fish and Wildlife Service (USFWS) is required to secure the permit. The USACE also may consult with the Federal Emergency Management Agency (FEMA) regarding flood hazards associated with proposed facility sites in hazard zones. A specific permit is not required with regard to minimizing flood hazards; however, avoidance of undue hazard is the prudent course of action.

Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands)

In addition to compliance with the Clean Water Act, the decision-makers for the project would be required to demonstrate compliance with two federal Executive Orders. Executive Order 11988 – Floodplain Management requires federal agencies to prepare a floodplain assessment for actions located within or affecting floodplains. Similarly, Executive Order 11990 - Protection of Wetlands requires federal government agencies to support a policy of minimizing "the destruction, loss, or degradation of wetlands." The intent of these Executive Orders is to minimize impacts on floodplains and wetlands. The Executive Orders seek to prevent development in floodplains and wetlands unless it is absolutely necessary and other alternatives are not available. For this project, placing transmission towers or other project elements in wetlands and floodplains would be avoided unless no alternative site is available.

Nevada Water Pollution Control Law

At the state level, the NDEP would require a Section 401 Water Quality Certification and Stormwater Discharge Permit. These permits likely could be combined with the permits described above. NDEP also is responsible for administration of the Nevada Water Pollution Control Law, which provides state authority to protect water quality for public use, wildlife, existing industry, agriculture, and the beneficial economic development of the state.

NDEP defines waters of the state to include surface watercourses, waterways, drainage systems, and underground water. NDEP administers the NPDES permits for surface stormwater water discharges but also requires that discharges into subsurface waters be controlled if a potential for contamination is present. NDEP requires a zero-discharge permit for projects with potential to contaminate groundwater. Drinking water protection under the Safe Drinking Water Act is administered by the EPA, which has granted the enforcement of the act to the Nevada Division of Health.

If required, a Grading Permit from each of the counties in which construction would occur would be applied for. The Grading Permits would address similar water quality protection issues and requirements to those needed for the federal and state permits. SPPC would include these permits in the COM Plan.

The permit issues relevant to protection to water resources would be addressed in SPPC's planned COM Plan, which would follow the EIS. Three key components of the COM Plan would address hazards and issues related to protection of water resources:

- A Hazardous Materials Management and Spill Prevention Plan (HMMSPP) would be required for the construction and long-term operation of the proposed facilities. The HMMSPP would include provisions to prevent discharges of hazardous and toxic materials into water bodies, among other requirements to protect air quality, health, and safety. Thus, approval of the HMMSPP would be linked to the SWPPP.
- SPPC would prepare a Stream Crossing Plan (SCP). The SCP is not a specific permit requirement; however, crossing of flowing streams and numerous dry channels would occur if the project were approved. The SCP would address measures to protect water quality, flow conditions in the channels, and associated biological and cultural resources in the area of potential effect (APE). Thus, the SCP addresses the same issues that comprise the various permit requirements to protect water resources.
- A Soil Conservation and Erosion Control Plan (SCECP) would address the issues related to soil erosion hazards and prevention of sediment discharges into water bodies and watercourses. The SCECP would have many of the same elements as the SWPPP and would demonstrate the plan for compliance with the BLM's Right-of-Way Guide Stipulations, BLM Handbook H-2801-1, Chapter II C.6.a to e.

3.3.2 AFFECTED ENVIRONMENT

This section presents an overview of the project area's water resources and the nature of flood hazards. The information is focused on issues and resources related specifically to potential project impacts.

GENERAL HYDROLOGIC SETTING

The Falcon to Gonder project is located in the Great Basin subsection of the Basin and Range Physiographic Province. The Great Basin subsection is noted as an arid geographic area with internal drainage. Because of the regional physiography and as no stream in the region is sufficiently large to sustain flow to the sea, the entire region is characterized by internal drainage. All rivers end in intermittent dry lakes known as playas, which form in the low-lying basins. The Great Basin is characterized by a linear arrangement of mountain ranges interspersed with valleys. The Great Basin is further divided into sub-areas; the project would be located wholly within the Central Area, which has similar characteristics to the Province but of generally higher altitude. Streamflow regime in the region is highly variable and depends on climatic, topographic, soil, and size characteristics of the catchment.

PRECIPITATION AND EVAPORATION

The region as a whole receives generally less than 10 inches of precipitation annually. Snowfall averages about 10 inches for the general region, which accounts for approximately one inch of the total average annual precipitation. In general, May through November is the drier period, and December through April is the wetter period. Monsoonal events in summer can cause episodic thunderstorms, which can result in destructive flash floods. Precipitation is generally in the form of snow in the winter. While precipitation is generally low in the region, the distribution of precipitation is strongly influenced by topography. The higher mountain ranges receive greater precipitation, coupled with lower rates of evaporation than the low-lying valleys. For example, precipitation records for the 1969-1973 period near Cortez (Table 3.3-1), located in a valley area at an elevation of approximately 5,000 feet, averaged 9.48

inches (BLM 1996). Beowawe (at an elevation of 4,696 feet) averages 6.44 inches annually based on long-term data collected since 1870 (with some data gaps). These stations are considered generally representative of lower elevation stations in the study region.

TABLE 3.3-1: MEAN MONTHLY PRECIPITATION (IN INCHES) FOR THE STATION AT CORTEZ MINE (1969 –1973)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
0.79	0.69	0.81	0.86	1.14	1.04	0.55	0.54	0.67	0.72	0.91	0.75	9.47

Source: BLM 1996.

Higher mountain ranges receive greater amounts of precipitation and snowfall. While data are few, it is roughly estimated that topographic elevations above 6,000 feet receive 6-12 inches average annual precipitation. Areas between 6,000 and 7,000 feet receive 12 to 15 inches, and zones 7,000 feet and higher receive 15 to 20 or more inches of average annual precipitation (BLM 1996). For example, Elko (at an elevation of about 5,100) feet receives about 9 inches average annual precipitation. Eureka (at about 6,600 feet) receives about 13.5 inches, and Midas (at about 7,200 feet receives) almost 19 inches of precipitation annually. Because of this topographic relationship to precipitation, all the significant streams in the region are sustained by runoff from the mountains. Streams fed by high mountain ranges with large catchments tend to have more sustained flow in springtime as a result of snowmelt and longer duration of spring flows. These flows drain to the valleys and either dry up or discharge into the playas or streams that drain into the Humboldt River. Monsoonal conditions from June through September can cause episodic thunderstorms, which can result in destructive flash floods.

The region has cold winters and hot summers. Evaporation is high from April to October when the region is hot. Pan evaporation data at Beowawe for the period 1981-1989 indicated an average evaporation of 57 inches for the April-October period (BLM 1996). That rate is about six times greater than the average annual precipitation at that location. Similar evaporation rates are characteristic of the entire study region for valley locations. Evaporation at higher elevations is expected to be less.

The distribution of precipitation and evaporation is reflected in the type of vegetation cover. Lower elevation areas are predominantly sagebrush and salt desert shrubs, whereas higher elevation areas support pinyon-juniper woodlands. Some of the highest ranges (e.g., the Ruby Mountains) have watercourses and lakes that contain abundant water year round. By contrast, the valley floor areas are drier. Where present, the playas are shallow and evaporate rapidly in the warm period. Surface water in the playas, if present at all, generally does not last beyond one water-year. Although the lakes are ephemeral, some playas have a large surface area when they contain water. None of the valley bottoms in the study region contain natural perennial lakes.

The arrangement of the mountains strongly affects distribution patterns of precipitation receipt and runoff. The region is characterized by a structural geologic system of upraised fault blocks forming semi-parallel mountain ranges separated by down-dropped inter-range valleys. In general, the mountains have steep slopes and shallow soils, conditions that promote rapid shedding of rainfall. By contrast, the valleys have been filled to great depths by alluvium derived from the erosion of the mountains. The valley areas absorb the runoff from the mountains, creating a widespread groundwater storage system. The linear arrangement of mountain ranges and valleys is aligned on a predominantly north-south axis. Some ranges, such as the Diamond Mountains, are oriented almost due north-south. Others, like the Cortez and Sulphur Spring Range, are oriented more northeast-southwest. The orientation of the ranges is reflected in the parallel arrangement of the intervening valleys, such as Crescent Valley and Pine Valley.

The relief between the mountain ranges and the adjacent valleys is substantial, typically on the order of 1,000 to 3,000 m. The base of each range commonly is fringed by alluvial fan aprons, which are inclined

at low angle and stretch broadly to the flat-floored valleys. Faulting and tilting of the block mountains have created closed drainage; in some areas, there is no drainage outlet for the rivers and drainage ends in playas (e.g., Newark Lake is such a water feature). Much of the drainage pattern in the region was established during the Pleistocene Epoch, a more humid period that ended about 8,000 - 10,000 years ago. There is evidence of ancient large permanent lakes having formed at that time in some basins.

The onset of arid conditions at the close of the Pleistocene changed the nature of hydrologic conditions and the erosional processes shaping the land. The ancient lakes dried up. Erosion of the mountain ranges continued, with sediment transport from the higher elevations and deposition at the base of the mountains, but stream systems became less capable of transporting the material. Sediment volumes carried in mountain streams exceed the capacity and competency of rivers to transport them out of the local valleys. Extensive alluvial fans continued to form where the streams emerge from the mountain front onto the valley floor.

Each alluvial fan was constructed by the deposition of alluvium associated with the migration of the watercourses across the face of the fan over eons of time, a process that continues to the present. In some cases, subsequent erosion has left remnants of the fans from earlier depositional processes. Often during large runoff events, the locations of the active conveyance channels shift abruptly in response to the deposition of the sediment debris loads entrained in the water.[1] Over time, the individual fans eventually formed by adjacent watercourses coalesced to form almost continuous alluvial aprons surrounding the base of each mountain range. In some areas, the basal area of a mountain range is formed by erosion of the lower rock materials; the remnant feature is known as a pediment. Pediments typically have somewhat shallower soils than alluvial aprons, but the surface topographic expression is in general similar to that of alluvial aprons. The resulting topography as expressed in the current landscape is comprised of a broad, flat basin plain, typically formed by fine-grained sediment and having closed drainage. The lowest portion of closed basins may be occupied by a mud flat periodically occupied by a playa lake.

The flat basin plain gives way to a broad, gently inclined alluvial apron comprised of stratified coarse sediments leading up to the mountain front. At the mountain front, there is an abrupt steepening of slope where harder geologic materials (rock with a thin soil veneer) form the surface. The mountains have steep slopes with bedrock near the surface, and streams are commonly entrenched in narrow, v-shaped valleys. Immense variation is observed in topography and drainage from the preceding descriptive model of the landforms and drainage because of local geologic structure, rock, and soil, as well as topographic alteration from human use in an area. However, the model is useful to understanding the conditions that commonly affect drainage conditions in the region as a whole.

REGIONAL HYDROLOGICAL RESOURCES

In general, the supplies of surface water in the region are meager. Rivers are few and small, most commonly formed as short watercourses in the mountains that drain steeply to the adjacent valleys, where they seep into the sediments and evaporate. A large part of the study region is drained by the Humboldt River, which is the master stream of the region. Parts of Crescent Valley, Pine Valley, and Huntington Valley drain into the Humboldt River. It is also the only perennial river in the study region. Average annual discharge of the Humboldt River is quite variable.

Hunt (1967) estimated a flow on the order of 500,000 acre-feet per year. However, base flow data collected by the USGS in 1992 on the river at Beowawe indicated 17.9 cubic feet per second (cfs), with an additional 13 cfs of irrigation diversions for a total of 30.9 cfs; that translates to an estimated 22,327

[1] It is difficult to predict the location of active channel migration across the fan surface. For this reason, FEMA treats alluvial fan surfaces as being located in the 100-year flood hazard zone.

acre-feet-year for that year (BLM 1999). However, most of the study region basins have interior drainage. While few data exist on streamflow in the region, none match that of the Humboldt River. The loads of salt in the watercourses are likely to be generally similar to that of the Humboldt River, and similar if not higher salt concentrations exist in playa lakes. As a result, some of the playas have salt crusts. However, most playas consist of bare clay flats without salt crusts, and the salts are distributed throughout the mud.

Although present throughout the region, wetlands are located near the study corridor at only two locations: the crossing of the Humboldt River, and in an area on the flats west of Beowawe.

Watercourses in the mountains, where flows gather, generally have good water, and freshwater springs feed many watercourses. Water quality rapidly declines as the flows decrease in quantity as they flow into and through the valley areas. For example, water in Humboldt River contains 300 to 600 parts per million (ppm) of salts, whereas water in the Humboldt Lake (the river's eventual terminus, located west of the study region) contains at least 1,000 ppm salts (Hunt 1967). Water in some playas reaches over 4,000 ppm (Hunt 1967). Thus, much of the surface water supplies in valley segments of rivers and in the playas are not usable for domestic and livestock purposes.

The importance of fresh surface water and freshwater springs in the region for human use and wildlife cannot be overemphasized. Some streams and springs, however, do not contain potable water. Surface waters and groundwater vary substantially in quality. For example, in Crescent Valley surface waters from Indian Creek, Mill Creek, and Fire Creek revealed relatively low total dissolved solids (TDS) and alkaline pHs (8.05-8.46). Most trace and minor constituents were reported to be below NDEP standards (e.g., for aluminum, arsenic, silver, cadmium, mercury, and thallium). These constituents may be partly related to effects of past mining in those watersheds (BLM 1999).

Groundwater from Crescent Valley alluvium was generally of good quality, meeting most of the primary and secondary drinking water standards, and is suitable for livestock, irrigation, and mining uses (BLM 1999). The average concentration of manganese was the primary constituent that exceeded state water quality standards; however, maximum concentrations did not meet drinking water standards for a variety of constituents. Bedrock water quality was reported to be similar to that of the alluvial aquifer but with higher concentrations of mineral constituents. The average concentrations met the primary standards for drinking water (BLM 1999).

Natural hot springs are located in portions of the region, notably in Crescent Valley at Beowawe. These springs are sufficiently heated to support geothermal energy production facilities. Most hot springs have highly mineralized waters, limiting their use for drinking water and livestock watering. For example, samples of hot springs in Crescent Valley had high TDS and a pH of 6.8 to 8.5 (BLM 1999). Wells that draw from geothermal sources in general have similar TDS and pH characteristics to hot springs. These wells exceeded maximum contaminant levels for fluoride, manganese, magnesium, manganese, sulfate, and TDS, and had elevated levels of calcium, sodium, sulfur, and potassium. Wells are an important source of water in the region for domestic use and livestock watering.

Common Characteristics of Watercourses

Gradient of watercourses is an important indicator of constraints related to engineering requirements, erosion hazard, and potential slope instability. For purposes of mapping and consistency with the analysis of slopes (see Section 3.1, Geology and Minerals), watercourses are classified into four groups: low (under 1% gradient), gentle (1% to 5%), moderate (>5% - 15%), and high gradient (greater than 15%).

In general, most watercourses in the region have three primary segments. The upper watercourse is formed in the mountains. Moderate and high gradients are common. Base flow comes from springs in

the rock formations. The source water comes from snowmelt in winter and spring, and some rainfall in summer. The upper courses typically have moderate to steep gradients, and often the channels are incised. The upper watercourses gather water and during flow periods are increasing in flow. Most of the watercourses have intermittent flows. Only streams in the highest ranges have perennial flows, and these are all small streams. In general, these mountain streams are formed into a system of tributaries that join to form a single master channel flowing in a v-shaped valley. Individual catchments vary in size and hydrologic character. As a general rule, the larger the area of the catchment at high elevation, the greater the potential for a larger volume of runoff and more sustained duration of flow in the watercourses. However, the aridity of the region is such that most watercourses, even in the high mountains, sustain only intermittent flow.

The middle segments of the watercourses are located where streams emerge onto the alluvial fan or pediment surfaces adjacent to the foot of the mountain ranges. Some fans have extended their heads up the canyon into the mountains, whereas others have their heads at the mountain front. Overall, the middle segments generally run approximately at right angles to the general alignment of the mountain range crest and valley axis. The middle segments of watercourses have gentle to moderate gradients, and there is a change from a gathering streamflow to a decreasing flow as the water seeps into the fan surface.

In general, the channel gradient drops gradually as the watercourse descends into the gentle slopes at the foot of the fan or pediment. The change in gradient and the reduced flow volume from seepage losses result in a drop in load. Eventually, the loss of flow and the drop of debris load blocking the channel are sufficient for the stream to change its course across the fan surface. Channels crossing a fan may split into more than one tributary. Seepage into the deep alluvium of a fan is rapid and evaporation rates are high, especially in the April – October period. As a result, most watercourses emerging from a mountain front carry insufficient volumes to reach the valley floor, and a recognizable channel disappears into the fan slope, or flow in the channel is insufficient to reach the dry lakebed in most years.

The third segment of the watercourses is the valley segment. Valley segments are universally of low gradient, and the watercourses flow in approximate parallel alignment to the axis of the valley. Stream channels become more circuitous as they flow across the gently inclined valley floor, forming meanders within an active floodplain. Many watercourses have such low gradient and high sediment loads that they form a braided channel (i.e., a complex system of intertwining channels). Often, a master channel is not distinguishable among the complex of braided channels. This is common for the larger watercourses that trend in alignment with the axes of the valleys. These streams discharge into local playa lakes formed at the lowest valley bottom area or, in some valleys, the streams continue on as tributaries of the Humboldt River. In general, runoff of many tributary streams in the study region to the Humboldt River occurs only during and shortly after large storms. At other times, the flows are insufficient to reach the river, although some underflow may continue for a while.

Flooding and Flash Flood Hazard

Seasonal flooding is characteristic of the region but largely confined to the watercourses and playa lakes. Flood hazards are extremely variable from year to year as a result of the variability in annual precipitation. In general, the aridity of the climate does not result in widespread, sizable floods. Snowmelt runoff in springtime (April through early June) produces the highest annual flows (BLM 1996). The coincidence of rainfall with the period of highest snowmelt runoff produces the greatest potential flood hazard. Winter and spring floods are reported in the Humboldt River Basin (BLM 1996; Eakin et al. 1966). Winter floods are generally high volume events of short duration when rain falls on snowpack. In general, flood hazards are low in summertime because of low precipitation, high evaporation, and localized rainfall distribution, which in combination produce small stream volumes. The exception to this is localized flash flood hazard.

Flash floods are a type of flood inundation but, because of the nature and severity of the event, represent a special hazard. They are unpredictable events, most commonly associated with summer rainstorms. Summertime precipitation in the region commonly comes in the form of thunderstorms, which typically are events of short duration and sometimes intense but localized rainfall. Large thunderstorms can result in flash floods. Most flash flood events are localized phenomena occurring during or shortly following cloudbursts, which are by nature localized events. The hazard of flash flood is prevalent in specific physiographic situations where the runoff from cloudbursts is quickly gathered in a watercourse. Flash floods can occur anywhere that intense rainfall occurs. However, it is cloudbursts in the upper watershed that are especially hazardous because the runoff is quickly shed on the steep slopes and concentrated into the main high gradient stream channels.

Flash floods are notably hazardous events in the middle and lower portions of a watercourse where the flows are concentrated but are related to the rapid runoff and concentrated streamflow in the upper portion of the watershed. The conceptual model conditions for a flash flood are represented by a physiographic situation in which there is a high mountain range drained by steep gradient tributary watercourses that join together in the mainstem at lower altitude, particularly where the lower mainstem has a confined channel (as is common where the stream emerges from the mountain face onto the alluvial fan/pediment). As a general rule, the larger the upper watershed in a mountain area and the steeper the gradients of its streams, the greater the potential for flash flood. The confined channel concentrates the flow and energy. The flood front rushes rapidly down channel, sometimes reported as a wall of water.

Often, people at risk are located at a stream channel in its lower reach and are unaware of the cloudburst and gathering flood in the upper watershed, which may be miles away from their location. The sudden appearance of the rapidly flowing flood front catches the victims unaware, sometimes resulting in loss of life and injury. Because flash floods carry large volumes of water and debris traveling at high speed, they have immense destructive potential. Capacity and competency to convey large rocks, great volumes of soil, and organic debris are high, and the concentrated energy of the stream is capable of considerable erosion. Flash floods are brief events that pass quickly after the cloudburst dissipates. They may leave a path of destruction, sediment, and debris. Additionally, as the flash flood stream emerges onto the gentler slopes of the alluvial fans, a rapid loss of stream capacity and competency occurs, and the stream quickly drops its debris load.

Groundwater

Springs are scarce but important features in the region because surface water supplies are limited for most of the year. Most springs are derived from groundwater flow in fractures, faults, and fault lines. The principal aquifers in bedrock in portions of the region are in carbonate rocks, siliceous rocks, and Tertiary volcanic rocks. Groundwater in the deep alluvium in the valleys and fans provides the most important source of water for wells in the study region. Shallow groundwater (e.g., near playas) is often saline, which limits its utility as a resource. Deep aquifers in the basins may produce high quality well water.

Although data are few, a substantial amount of the deep groundwater in the basins probably is derived from "fossil" waters dating back on the order of thousands of years when the water was trapped in the deep basin sediments. It is likely that the current arid climate of the region produces insufficient precipitation and infiltration to significantly recharge the deep groundwater. Additionally, the arrangements of geological materials (aquicludes, i.e., strata that retard flow to aquifers) or geologic structures limit recharge of deep-lying aquifers in some basins. Groundwater aquifers vary in each basin region. Underflow in the alluvium connects some basins, whereas other basins are closed hydrogeologic units. As noted, some springs are thermal.

The younger sediments that form alluvial fans in the region consist of coarse materials (boulders, cobbles, and gravel) and fine-grained materials (sand, silt, and clay) with variable discontinuous aquifer

characteristics. In general, the groundwater follows the gradient from the elevated head of the fan toward the valley floor. Because of the contract in hydraulic conductivities between the coarse materials comprising the fan at its head and the finer materials at the toe at the valley floor, springs and seeps sometimes form along the toe of the fan.

Use of Water Resources

The entire project area is sparsely settled. Most of the region has widely scattered residences and small villages that depend on groundwater. Elko, Ely, and Eureka are the largest urban centers in the project area. These communities also rely on groundwater for domestic water supplies. Other water uses include mining, livestock, and a small amount of irrigated agriculture. Livestock watering ponds are supplied by wells, springs, and surface streams and are scattered throughout the area. There are no large reservoirs in the project area and only a few small impoundments in the vicinity of the route alternatives.

3.3.3 ENVIRONMENTAL CONSEQUENCES

This section presents the project-related actions for construction and long-term operation that may have significant impacts on the hydrologic environment, as well as significant hydrologic hazards that may affect the safety and operational reliability of the transmission line facilities. This section also includes mitigation measures to avoid or eliminate the impacts or reduce the effects to a less-than-significant level.

It is important to note that specific locations for transmission towers, material yards, and temporary spur roads have not yet been determined. Therefore, the assessment addresses potential impacts, some of which are likely to be avoided by discretionary site selection decisions by the project engineers and construction contractor. However, for purposes of a conservative analysis, no assumption is made about specific siting to avoid hazards or impacts.

SIGNIFICANCE CRITERIA

Project construction and operation activities would have a significant impact on water resources if they would:

- Result in discharges of contaminants and substantial amounts of sediment into receiving waters and watercourses or otherwise degrade water quality.
- Substantially alter the normal flow of a watercourse.
- Substantially alter the existing drainage pattern and runoff of the site or area.
- Disrupt the normal flow of springs and water wells.
- Result in failure of the proposed facilities due to flooding in an existing stream channel and/or a flash flood event.

The preceding impact criteria require further definition for purposes of the analysis. In general, impacts can be rated as high, medium, or low, indicating the relative severity of the hazard or effect. Impacts rated high or medium are regarded as potentially significant impacts and require mitigation to reduce the impact to a less-than-significant level.

Stream Crossings and Potential Impact Zones

Construction activity and placement of transmission towers or other facilities in the active channel of a watercourse, standing water body, or wetland would be considered to have a high potential for a significant impact before mitigation. Disturbances within approximately 20 feet of the edge of a streambank would also be considered potentially high impact zones. Construction in this zone would be

considered a significant impact and mitigation measures would be required to prevent significant impact to water resources. Watercourses are identified on USGS 1:24,000 topographic quadrangles as blue lines and blue shading. These locations are deemed immediately susceptible to impacts of contaminant discharge and alteration of normal flows by proposed structures or construction effects.

Construction activities and placement of transmission towers or other facilities within 100 feet of the active channel of a mapped watercourse (blue-line on USGS 1:24,000 topographic quadrangles), standing water body, or wetland would be considered having moderate potential for significant impact before mitigation, although less degree of hazard than the zone within 20 feet of a watercourse, and generally would be a less-than-significant hazard. This is a conservatively defined area of potential impact. It is intended to encompass a variety of potential situations for impact, especially slope, and the system of tributary channels carrying ephemeral streams that flow directly into a mapped watercourse. Mitigation would depend on the individual site conditions

Construction activities and placement of transmission towers or other facilities beyond 100 feet of the active channel of a mapped watercourse, standing water body, or wetland are considered to have low potential for impact.

Springs and Water Wells

Construction activities and placement of transmission towers or other facilities within 500 feet of a spring or seep would be considered a high impact before mitigation. Springs are identified on USGS 1:24,000 topographic quadrangles by blue symbols. These locations are deemed immediately susceptible to impacts of contaminant discharge and disruption of normal flows by proposed structures or construction effects. The 500-foot study corridor was established for purposes of this EIS analysis based on the assumption that 500 feet reasonably provides adequate distance from a construction zone: 1) to prevent damage to the well/spring by machinery and vehicles, and 2) to ensure that other activities do not result in impacts on the area immediately surrounding a spring or shallow well field activities (e.g., soil compaction, silt generation, cuts opening of a new spring that might divert waters, etc).

Construction activities and placement of transmission towers or other facilities within 0.25 mile of a spring or water well are considered a low to medium potential for significant impact before mitigation, depending on the local topography and geological conditions.

Construction activities and placement of transmission towers or other facilities beyond 0.25 mile of a spring or water well are considered to have low potential for significant impact or no impact.

Flood Inundation

Placement of transmission towers or other facilities within the active channel or floodplain of a watercourse wider than 3,500 feet is considered a high potential for significant impact before mitigation. Areas of braided watercourses are considered as a unit (rather than treating each channel as separate

watercourse). Watercourses and floodplains are identified on USGS 1:24,000 topographic quadrangles by contours indicating the approximate banks of the general floodplain.[2]

Depending on local conditions, placement of transmission towers or other facilities within the active channel or floodplain of a watercourse wider than 1,000 feet but less than 3,500 feet is considered a moderate potential for significant impact before mitigation. Areas of braided watercourses are considered as a unit (rather than treating each channel as separate watercourse). These impact distance criteria are based on the reasonable distance between transmission towers with which the project engineers can locate the facilities. As a general rule, 1,700 feet is the approximate longest distance for most spans of the proposed project. Thus, a watercourse that is 1,000 feet wide usually can be spanned by the transmission line with towers located outside the flood inundation zone, and there is approximately 700 feet leeway with which to work (considering the positioning of adjacent towers). If the flood inundation zone of a watercourse is wide, then it may be necessary to place one or more transmission towers in the flood zone. Given the working assumption on flexibility in span between transmission towers, 3,500 feet was chosen as a reasonable distance for the impact criterion because the crossing of any watercourse of that width would likely need at least one transmission tower sited within the flood zone.

Placement of transmission towers or other facilities within the active channel or floodplain of a watercourse less than 1,000 feet wide is considered a less-than-significant impact because the flood hazard zone could be spanned with normal construction. Areas of braided watercourses are considered as a unit (rather than treating each channel as separate watercourse).

Flash Flood Hazard

Placement of transmission towers or other facilities within the active channel or floodplain of a watercourse, the catchment of which has physiographic characteristics generally indicative of conditions conducive to flash flood events, is considered a high potential for significant impact before mitigation. Watercourses and catchments potentially conducive to flash floods are identified on USGS 1:24,000 topographic quadrangles.[3]

The hazard of flash flood is prevalent in specific physiographic situations. Flash flood is a type of flood inundation but, because of the nature of the nature and severity of the event, represents a special hazard. Because flash floods are localized phenomena occurring during summertime cloudbursts, few data are available to map flash flood hazard. An interpretation of flash flood hazard has been made based on a qualitative assessment of the physiographic situation appropriate to flash flood conditions, as follows. Flash floods are localized events in the middle or lower portion of a watercourse but related to runoff

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[2] Note 1: The topographic maps vary in the age since their most recent updates, and changes in the channel configurations may have occurred in the interim; therefore, the locations of the floodplains are approximate. Nonetheless, this is generally suitable for purposes of the impact assessment.

Note 2: The width of 3,500 feet was selected because it is approximately twice the upper span length between towers; a floodplain of this width would necessitate at least one tower being placed in the flood zone.

Note 3: Flood inundation mostly only interrupts normal maintenance; the hazard is primarily related to the erosion and scour associated with floods and because towers can block debris entrained in flood waters.

Note 4: FEMA regards the entire surface of an alluvial fan as a 100-year flood zone because individual watercourses migrate across the surface of the fan, with changes in channel locations sometimes occurring abruptly. However, for purposes of this analysis, an alluvial fan surface is not considered a floodplain because the inundation in storm events would remain localized. Impacts related to stream courses are covered in previous criteria.

[3] The topographic maps vary in the age since their most recent updates, and changes in the channel configurations may have occurred in the interim; therefore, the locations of the floodplains are approximate. Nonetheless, this is generally suitable for purposes of the impact assessment.

events in the upper portion of the watershed. The larger the upper watershed and the steeper the stream gradients, the greater the potential for flash flood. Thus, to have a flash flood hazard, the following operational criteria were regarded to be necessary to qualify as conditions conducive to creating flash flood hazard conditions: (1) high degree of relief in the watershed, generally at least over 2,000 vertical feet; (2) steep gradient of the stream system; (3) more than three tributary streams to the mainstem draining an area totaling at least 3 square miles; and (4) a relatively confined channel for the lower stem. While flash floods can occur in any area where intense rainfall occurs over a local area (whether these conditions are present or not), there is no way to distinguish between the relative hazards other than presence of a stream channel. Because this is a qualitative intuitive evaluation, the criteria are general and presented in terms of the relative presence of these conditions.

Placement of transmission towers or other facilities within the active channel or floodplain of a watercourse, the catchment of which has some of the physiographic characteristics generally indicative of conducive to flash flood events, is considered a moderate potential for significant impact before mitigation. Watercourses and catchments potentially conducive to flash floods are identified on USGS 1:24,000 topographic quadrangles and soil surveys provide some indication of the hazard.

Placement of transmission towers or other facilities within the active channel or floodplain of a watercourse, the catchment of which has few of the physiographic characteristics generally indicative of being conducive to flash flood events or for which soil surveys indicate a similar hazard, is considered a less-than-significant impact before mitigation.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to all Route Alternatives

The following presents the impacts and associated mitigation measures that are common to all route alternatives of the project.

The proposed transmission line would cross many drainage features. Table 3.3-2 identifies the number of potential watercourse crossings mapped as blue-line symbols on USGS topographic maps.

❑ ***Impact Water-1: Potential Spills or Discharges During Construction***

Project construction activities could potentially result in discharges of contaminants into receiving waters, watercourses, wetlands, and stock watering ponds, degrading their water quality. Hazardous and toxic substances needed for construction include fuels, motor oil, coolants, antifreeze, solvents, battery acid, brake fluid, gasoline additives such as MTBE, paint, and other substances used by vehicles, motorized machinery, and heavy equipment. Additionally, explosives may be used in some areas. Accidental spills could cause contaminants to be transported into waterways at the time of the spill, or in runoff during subsequent rain storms or by snow melt. The impact is potentially significant and mitigation is required.

❑ ***Mitigation Measure Water-1a***

To the extent practicable, SPPC would minimize the use of hazardous and toxic substances and minimize the need for disposal of hazardous and toxic wastes. By reducing the use of hazardous and toxic substances, the potential to result in spills would be reduced commensurately. SPPC's construction contractor would collect and recycle hazardous materials and wastes that can be readily recycled (e.g., motor oil and lubricants). Hazardous substances or wastes would be removed from construction sites following the construction period.

TABLE 3.3-2: NUMBER OF WATERCOURSE CROSSINGS, SPRINGS, OR WATER WELLS WITHIN 0.25 MILE OF ROUTE SEGMENTS

Segment or Re-route	Number of Crossings of USGS Blue-line Watercourses	Springs within 500 feet	Wells within 500 feet	Springs and Wells within 0.25 Mile
A	11	2	1	2
B	52	-	-	3
E	58	-	-	3
D	26	-	-	3
E	103	-	-	3
F	24	-	-	3
G	45	-	1	3
H	30	-	-	2
I	31	-	-	6
J	76	-	1	2
K	5	-	-	1
L	12	-	-	-

Source: EDAW 2000 (from USGS 1:24,000 Topographic Quadrangles)

❑ ***Mitigation Measure Water-1b***

SPPC would prepare a Hazardous Materials Management and Spill Prevention Plan (HMMSPP) for the construction and long-term operation of the proposed facilities and be responsible for its implementation by the construction contractor. The HMMSPP would identify hazardous materials proposed for use in the construction and operation of the facilities. The HMMSPP would include provisions to prevent discharges of hazardous and toxic materials into water bodies, watercourses, wetlands, and livestock watering ponds. The HMMSPP would include specific measures to contain hazardous and toxic substances used in storage, fueling, vehicle/machinery servicing, and disposal areas. The HMMSP would identify labeling and storage requirements. The HMMSPP would identify containerization requirements for hazardous and toxic substances used during construction and operation of the project. It would identify planned transportation routes and the active area of operation of machinery, equipment, and vehicles. The HMMSPP would identify spill control and countermeasures including notification and reporting requirements immediately following a spill and in the period of clean-up.

The HMMSPP would specify the nature of any hazardous waste materials generated during construction and operation of the project, their disposal, and the disposal of any containers containing hazardous substances, as well as waste oil filters. The HMMSPP would identify a program of worker education and training, as well as spill response training. Best management practices and controls for spill prevention and countermeasures would be employed for HMMSP components. SPPC environmental monitors would submit a report in conjunction with other project environmental reports, detailing how compliance with the HMMSPP occurred during construction. The HMMSPP would indicate how SPPC would ensure that its contractors meet the requirements of the HMMSPP.

❑ ***Impact Water-2: Erosion and Sediment from Construction***

Project construction activities could potentially result in discharges of sediments into receiving waters, watercourses, wetlands, and livestock watering ponds, creating turbidity and degrading water quality. During construction, some soils would be denuded of vegetation cover, exposing them to potential erosion and discharge into watercourses. Grading activities and road blading

could result in soils being sidecast or bulldozed into piles subject to wind and water erosion and subsequent discharge into watercourses. The hazard generally would be greater for grading activities on areas with higher gradient. The impact could potentially violate provisions of the federal Clean Water Act and could adversely affect biotic resources. The impact is potentially significant and mitigation would be required.

❑ ***Mitigation Measure Water-2a***

To the extent practicable, SPPC would minimize surface-disturbing activities within the channel of watercourses. This may entail relocating facilities and activities to avoid the necessity of filling, cutting, or otherwise altering the channel of watercourses.

❑ ***Mitigation Measure Water-2b***

If a stream channel cannot be avoided, SPPC would require its contractors to either avoid construction activities involving soil disturbance in a watercourse during periods of flow or, alternatively, "in the dry" construction measures would be used (e.g., provide a temporary or permanent diversion channel and/or install a culvert with a design capacity similar to the unaltered channel). If a temporary diversion channel is constructed, following completion of construction activities, the channel would be re-graded to stable contours, the soils would be stabilized and re-seeded with an approved seed mix, or re-vegetated to ensure the long-term stability of the channel and to prevent erosion. Temporary fencing would be installed to prevent livestock from entering the disturbed area until it has a stabilized vegetation cover (however, access to water would be provided for livestock at places, see Mitigation Measure Range-1). SPPC would include measures in its COM Plan to address erosion and sediment discharge into stream courses.

❑ ***Mitigation Measure Water-2c***

If soil or other debris is placed in a channel or piled by bulldozers and grading equipment on the bank during construction, the soil would be removed from the channel or bank and appropriately spread and stabilized to prevent its entrainment in discharge events. If a temporary stream diversion berm is constructed, following completion of construction activities, the berm would be removed and the soil appropriately disposed and stabilized to prevent erosion.

❑ ***Mitigation Measure Water-2d***

SPPC would prepare a Stream Crossing Plan (SCP) and ensure compliance of the construction contractor with it. The SCP would address measures to protect water quality, flow conditions in the channels, and associated biological and cultural resources in the area of potential effect. The SCP would provide specific measures to prevent soil erosion and sediment deposition in all construction disturbance areas within 100 feet horizontally of a watercourse (especially any flowing watercourse that is greater than approximately 10 feet wide and 3 feet deep). For small watercourses and those with no flow in the construction period, generic mitigation measures in the SCP will be applied. Such measures would normally include best management practices for construction to control erosion and silt deposition and stabilize the site after completion of construction.

❑ ***Mitigation Measure Water-2e***

A Soil Conservation and Erosion Control Plan (SCECP) would be required and would include measures to prevent sediment discharges into water bodies and watercourses. The SCECP would demonstrate the plan for compliance with the BLM's Right-of-Way Guide Stipulations, BLM Handbook H-2801-1, Chapter II C.6.a to e and State of Nevada Environmental Commissions Handbook of Best Management Practices.

❑ ***Impact Water-3: Potential Watercourse Obstruction***

While SPPC would locate transmission towers to avoid watercourses to the extent feasible, it may not be possible to span every watercourse. Thus, project construction activities and the placement of transmission towers in a watercourse could potentially result in an obstruction of or alteration of flows. The impact would be significant. The obstruction of a watercourse could reduce the conveyance capacity of the active channel, result in erosion and undermine the channel bank stability, and/or or result in a shift in the active channel location with associated environmental effects and property damage. Additionally, stream scour could undercut the support structure in the watercourse and undermine the stability of the tower. Mitigation would be required.

❑ ***Mitigation Measure Water-3a***

To the extent practicable, SPPC would attempt to avoid the placement of any transmission tower within the channel of a watercourse greater than approximately 20 feet in width and more than 5 feet deep. SPPC would set back all towers to a position that would not increase the potential to undermine streambank stability or pose a hazard to the tower foundation.

❑ ***Mitigation Measure Water-3b***

If placement of a transmission tower or road is unavoidable within a stream channel, SPPC would require its contractor to construct a permanent diversion structure or culvert sufficient to carry the stream's normal conveyance capacity at that site. The structure would be constructed in such a way as to armor the diversion from erosion at the point of diversion and at the point where it re-joins the channel. Culverts would be sized to convey the flows of the natural channel. The culvert would be constructed to prevent erosion at its intake and outlet end. Culverts and diversion structures would be inspected and cleared of debris and sediment to maintain their conveyance capacity. These measures should be included in the SCP. In the event that the structure would have a minimal reduction on capacity of a large channel, as determined by calculations of the project engineer, this mitigation measure may not be required.

❑ ***Mitigation Measure Water-3c***

If placement of a transmission tower or road is unavoidable within a stream channel, and a permanent diversion structure or culvert is deemed impractical by the project engineer, the foundation of the structure would be armored to protect it from scour by the watercourse. The structure or road would be armored with rock, such as river rock or gabions, or cement/concrete in the channel. The tower footings and road surface structures would be inspected regularly and cleared of debris. These measures should be included in the SCP.

❑ ***Mitigation Measure Water-3d***

Existing watercourse crossings would be used to the maximum extent possible. If construction requires working within the active channel of a flowing watercourse, the area of soil disturbance activity or crossing would be held to the absolute minimum. Blading would not be used to facilitate the crossing of a watercourse carrying a discernible flow of water. A temporary bridge would be placed over the channel, a temporary diversion and/or culvert would be constructed, or for small watercourses a swamp mat would be placed in the channel, as appropriate for the channel and flow conditions at the time. Straw bales or silt fences would be placed in small watercourses to trap sediment from construction. Following construction, the bales and silt fences would be removed.

❑ ***Impact Water-4: Soil Compaction and Increased Runoff***

Project construction activities and the construction of substations could result in a change in the surface permeability of the soil. Compaction by heavy equipment and vehicles at construction

sites could reduce the ability of the soil to absorb rainfall and snowmelt. That effect, in turn, could result in increased runoff and incremental effects on flood flows. Impermeable surfaces at substation sites could have similar impacts. The impact is potentially significant and mitigation would be required.

❑ ***Mitigation Measure Water-4***

SPPC would require its contractor to carry out a program of soil restoration at all construction sites. Soil should be bladed or otherwise broken up to reduce compaction. The soil surface then should be imprinted (micro-textured) to help capture rainfall, promote soil aeration, reduce the potential for rill erosion, and encourage natural revegetation. On slopes with over 5% gradient, seeding and vegetative restoration would be required. SPPC would repair any erosion created by runoff from project facilities, especially roads and substations (see Mitigation Measures Soil-2 and Soil-4).

❑ ***Impact Water-5: Potential Damage to Springs and Wells***

Project construction activities could potentially affect the flow of springs and the operation of water wells, particularly if they draw on shallow groundwater. Blasting, heavy machinery, and grading activities have the potential to damage springs and wells, affecting their flow and production rates. Accidental spills of hazardous substances could result in contamination. Dewatering, if required for some construction sites, could adversely affect shallow groundwater conditions. The impact is potentially significant and mitigation would be required.

❑ ***Mitigation Measure Water-5a***

Prior to construction, SPPC would conduct a survey of the route to identify all springs and water wells within 1,000 feet (horizontal) of the construction zone. Depth, flow conditions, and hydrogeologic relationships would be identified. Additionally, the spring survey would include an assessment by a qualified biologist to determine if any sensitive endemic species are present at the spring or in the immediate vicinity that are dependent on the spring. The construction contractor would avoid carrying out soil disturbance activities within 100 feet (horizontal) of any spring or well without implementation of proper BMPs. Blasting would be prohibited within 500 feet of a spring or well, and only size-limited blasting would be allowed within 1,000 feet, unless it can be demonstrated in a report prepared by a qualified hydrogeologist that no effect on the well or springs can be reasonably expected to occur or that the effects can be effectively mitigated. SPPC would repair any damage to a spring or well resulting from construction activities.

❑ ***Mitigation Measure Water-5b***

Construction activity in the vicinity of springs and wells would include special precautions to prevent spills of contaminants, discharges of foreign materials, and direct or indirect sediment discharges at and near the spring or well site. No hazardous substances would be stored or handled at a spring or well site. Heavy equipment/machinery would not be operated within 100 feet of a shallow well or spring without implementation of proper BMPs.

❑ ***Mitigation Measure Water-5c***

Construction activity requiring dewatering would be planned to result in minimal effects on springs and wells. This may include employing rapid construction techniques for structural foundation excavations requiring dewatering to minimize effects of the cone of depression in the water table. Flow or water level changes in nearby wells or springs would be monitored and supervised by the construction monitor. If loss of supply to the well or spring owner would result in temporary or permanent hardship or economic loss to the owner, SPPC's contractor would be required to provide an alternative water supply.

❑ ***Impact Water-6: Flash Flood Hazard to Towers***

Transmission towers could be constructed in areas subject to flash flood hazards. Because of the sometimes extreme erosive power of flash floods, severe damage to towers could result, potentially including tipping. The impact is potentially significant. As flash flood events cannot be predicted effectively, the impact cannot be wholly eliminated. However, mitigation measures can be applied to reduce the hazard to within an acceptable level of risk.

❑ ***Mitigation Measure Water-6a***

In general, avoid placement of towers within or in proximity to an active channel of a watercourse on the upper part of an alluvial fan, particularly where it emerges at the canyon mouth at the mountain front. Watercourses with a sizable catchment in the mountains may be especially prone to flash floods. Tower placement in such potential flash flood hazard areas would be based on the decision of the project engineer or an engineering geologist. Additionally, it is recommended that SPPC conduct interviews with local officials and residents to obtain anecdotal information about past flash flood events to locate specific historic hazard areas.

❑ ***Mitigation Measure Water-6b***

Where placement of a tower near the head of an alluvial fan near the canyon mouth is unavoidable, a geotechnical engineer should be retained to design appropriate protective measures for the towers at risk. For example, this might include deeper footings and extra reinforcement at the base of the tower, construction of earthen berms to deflect water around the tower, constructing diversion channels, modification of the natural channel of the watercourse, or other measures as deemed appropriate for the site by the project engineer.

Access Road Impacts

Centerline clearing, spur roads, and improvements to existing access roads could adversely affect hydrological conditions, runoff, and water quality. The impacts would be similar to those described for Impacts Common to All Route Alternatives. The impacts could be direct (e.g., filling of a watercourse without providing appropriate drainage, spills of contaminants into watercourses, and direct placement of sediments in the channel). The impacts also could be indirect through discharges of sediment and contaminants that find their way into the watercourse and are transported downstream. Depending on road location, springs, wells, and ponds also may be affected by blasting or contamination. The following is a generic assessment of the impacts of access roads and related mitigation measures. The COM Plan will address individual access roads.

Mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives. Best management practices for construction would be required.

❑ ***Impact Water-7: Access Road Impacts***

Clearing of the centerline travel route and temporary spur roads within the 500-foot study corridor, as well as improvements to some existing access roads outside of the 500-foot corridor, could result in the creation of new erosion gullies or expansion and accelerated erosion of existing erosion features. In general, the greater the slope, the more potential there is for surface runoff to result in erosion and the attendant deposition of sediment in watercourses. The impact is potentially significant and mitigation would be required.

❑ ***Mitigation Measure Water-7a***

The construction contractor would limit access road clearing and improvements to the minimum required. In some areas, construction using helicopters may be the environmentally least damaging approach.

❑ ***Mitigation Measure Water-7b***

The centerline travel route and temporary spur roads would not follow dry washes or watercourses, and all watercourse crossings would be selected to require minimum disturbance to the channel and banks.

❑ ***Mitigation Measure Water-7c***

To the extent possible, the construction contractor would schedule road improvement activities during dry periods to reduce erosion of newly graded surfaces. Mitigation Measure Soil-1 also addresses this issue.

❑ ***Mitigation Measure Water-7d***

SPPC would include road construction and widening within the Soil Conservation and Erosion Control section of the COM Plan. A variety of drainage control structures would be used to direct surface runoff away from the road surface to prevent rill and rut development and to control runoff and sediment discharges. The road improvements would include culverts, water bars at appropriate intervals related to slope and geologic material, ditches, and appropriate grades and inclination.

❑ ***Mitigation Measure Water-7e***

SPPC's construction contractor would not sidecast spoils from road improvements into or in proximity to canyons, sidewalls, streams, gullies, drainage ditches, or wetlands. Where soil placement is necessary in watercourse, the material will be placed and engineered to ensure its long-term stability and protection from erosion. Spoil piles would be removed immediately after road reclamation activities, in accordance with the Reclamation Plan, are complete. All spoil disposal sites would be located, graded, compacted, seeded, and left in manner that is well-drained and protected from erosion. Spoil disposal sites should not be located within or in the immediate vicinity of watercourses. All off-site spoils disposal should be approved by the appropriate local BLM Field Office or the county with jurisdiction.

Segment A

Segment A, shared by all route alternatives, would include the crossing of the Humboldt River, 3 low gradient intermittent watercourses in Boulder Valley, and 10 small or medium gradient watercourses identified as blue-line watercourses on USGS topographic quadrangles. The segment mostly would traverse valley and fan areas along the eastern flank of the Shoshone Range with low to gentle slope. Two springs are located within 500 feet of the alignment and a number of wells would be located close to the segment. The well at the Dunphy Ranch is close to the proposed route and could be subject to potentially significant impacts.

❑ ***Impact Water-8: Humboldt River Crossing Inundation Hazard***

The crossing of the Humboldt River floodplain presents the most significant flood inundation hazard of any of the segments. While the width of the Humboldt River floodplain is broad, SPPC believes it would be able to span the entire channel because one side of the channel (next to the highway) is relatively high. However, it may be difficult to span a distance of more than 1,500 feet. Because it appears that the span is possible, the impact is considered less-than-significant and additional mitigation is not required.

❑ ***Impact Water-9: Potential Discharges to Humboldt River***

The crossing of the Humboldt River floodplain may entail disturbance of the soils and direct discharges into the river. The river is the single-most significant water feature in the region, and impacts to its water quality would constitute a significant impact. Similarly, the crossing of the

Rose Canal poses similar hazards of contamination of water during construction. Mitigation is required. Mitigation measures for Impacts Common to All Route Alternatives would be applied to the crossing of the Humboldt River.

❑ ***Mitigation Measure Water-9***

SPPC would include a specific section on the crossing of the Humboldt River within its HMMSPP. The section would address in detail measures to site facilities, construct them with minimal disturbance and hazards to the river, and site clean-up and restoration following construction. Because well protection is important, Mitigation Measures Water 1a – 1b and Water 6a – 6b should be given special attention in the COM Plan.

Segment J

Segment J, shared by all of the route alternatives, would cross Jakes Valley, Smith Valley, Steptoe Valley, and the upper portion of Long Valley, all of which have internal drainage. The segment would make 76 crossings of channels shown as USGS blue-line watercourses. Of the total crossings, 23 are low gradient intermittent watercourses, 47 are gentle gradient watercourses, 4 are medium, and 2 are high gradient watercourses. These streams drain the slopes of the White Pine Mountains, Butte Mountains, and Egan Range. The segment would traverse portions of the Butte Mountains and Egan Range, where some moderate gradient watercourses are located. Flood hazard is generally low.

Segment J would pass within 0.25 mile of Sammy Springs in the Butte Mountains and a stock pond. Springs and wetlands located near Hercules Gap in Smith Valley are also a little beyond 0.25 mile from the segment. Contamination from construction would be a potentially significant impact. This is a sensitive resource area, and Mitigation Measures Water 1a –1b and Water 6a – 6b should be given special attention in the COM Plan. Hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Alternative-Specific Impacts

The following discussion is focused on the impacts associated with each of the five route alternatives, discussed by segment where appropriate. To avoid repetition of text, the discussion refers to the nature of conditions that create impacts and hazards that are similar to the general impacts for the project as a whole. The discussion identifies any effects unique to that route alternative or segment which may differ in kind or intensity from those presented in the previous impact discussion. Because each of the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

Note that detailed segment-by-segment data tables were prepared for the project; these tables summarize, by milepost, the elevation, topography, hydrologic features, and potential hazards for each segment. These segment-specific data are not necessary for purposes of NEPA analysis. However, they have been compiled in a separate Water Resources Technical Memorandum (EDAW, 2001).

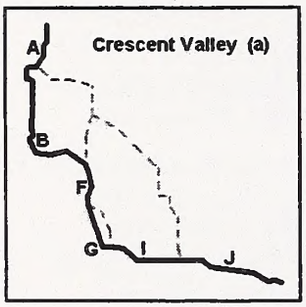
For comparative purposes, the number of USGS blue-line watercourse crossings, springs within 500 feet, wells within 500 feet, and springs and wells within 0.25 mile are summarized by route alternative in Table 3.3-3.

TABLE 3.3-3: NUMBER OF WATERCOURSE CROSSINGS, SPRINGS, OR WATER WELLS WITHIN 0.25 MILE OF ROUTE ALTERNATIVES

Segment or Re-route	Number of Crossings of USGS Blue-line Watercourse	Springs within 500 feet	Wells within 500 feet	Springs and Wells within 0.25 Mile
Crescent Valley (a)	239	4*	4*	18
Crescent Valley (b)	224	4*	4*	18
Pine Valley (a)	271*	2	3	19*
Pine Valley (b)	256	2	3	18
Buck Mountain	179	2	3	10

**represents the highest number of hydrological features associated with a route alternative*

Crescent Valley (a) Route Alternative



The Crescent Valley (a) route alternative is comprised of Segments A, B, F, G, I, and J. In addition to the impacts common to all route alternatives discussed above (i.e., Impact Water -1 through 9), specific impacts for the Crescent Valley (a) route alternative are listed below by their general location (segment).

Segment B

Segment B, shared by both the Crescent Valley route alternatives, is located in Crescent Valley, Denay Valley, and Garden Valley, all of which all drain into the Humboldt River. A section of Segment B crosses part of Grass Valley, which has internal drainage. There would be 52 crossings of watercourses in this segment including 17 low gradient, 9 gentle gradient, and 38 medium gradient channels. None of the watercourses are of substantial size. Horse Creek, Pine Creek, Denay Creek, and Henderson Creek in Pine Valley are the larger watercourses, and the crossings would occur in the lower reaches with gentle gradients. Flood inundation hazard is present in those four areas. Flash flood hazard may potentially exist at the crossing of the watercourse below Mills Canyon in the Cortez Mountains.

The watercourses crossed by this segment are predominantly low to gentle gradient valley floor and alluvial fan streams. A small portion of the segment would cross the Cortez Mountains and Canyon, where slopes and watercourses have moderate to steep gradients. Potential impacts of stream crossings and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

The original alignment of Segment B (i.e., the portion that would be replaced by the L re-route shown in Figure ES-1) would pass close to thermal springs in Whirlwind Valley. At least three of the mapped springs are within the 500-foot construction corridor, and several more are within 800 feet. However, field inspection did not encounter flow in the springs. Geothermal energy development at the Geysers may have affected these springs such that flows no longer occur. This is a sensitive groundwater resource area. A spring is also located within 500 feet of the alignment northwesterly of Cortez. Mitigation Measures Water 1a –1b and Water 6a – 6b should be given special attention in the COM Plan. The segment also would pass within 500 feet of a well westerly of Crescent City.

K Re-route (along Segment B)

Table 3.3-2 summarizes hydrologic features and hazards associated with the K re-route. This is a potential option for re-routing a portion of Segment B around an area that contains sensitive resources (see Figure ES-1).

The K re-route would cross watercourses in the Toiyabe Range near Cortez Canyon. The K re-route would cross 5 USGS blue-line watercourses that are medium to steep gradient features draining the slopes of the mountains. Flood hazard is generally low.

The re-route would pass within ½ mile of springs in Copper Canyon that are downgradient of the crossing site. Contamination from construction would be a potentially significant impact. This is a sensitive resource area, and Mitigation Measures Water 1a–1b and Water 6a – 6b should be given special attention in the COM Plan. Under the original alignment for Segment B in this area, the Copper Canyon Springs would be more distant from the disturbance area than for this re-route. However, the proposed route would place the transmission line within ¼ mile of a spring in Cortez Canyon; therefore, the potential for impact would be somewhat less. Hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

L Re-route (along Segment B)

Table 3.3-2 summarizes hydrologic features and hazards associated with the L re-route. This is a potential option for re-routing a portion of Segment B around an area that contains sensitive resources.

The L re-route would cross 12 USGS blue-line watercourses that are small, medium gradient features draining the slopes of the Shoshone Range. Flood hazard is generally low.

The re-route would not pass within ¼ mile of any mapped springs or wells. Selection of the re-route would avoid sensitive springs in Whirlwind Valley that are close to the original alignment of Segment B. Hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Segment F

Segment F, shared by the Crescent Valley and Pine Valley route alternatives, would be located in Garden Valley, which is drained by Henderson Creek. The area forms the headwaters of Henderson Creek, a tributary of the Humboldt River. Approximately 24 USGS blue-line watercourses would be crossed by Segment F. These are 6 low gradient, 15 gentle gradient, and 3 medium gradient watercourses that drain the eastern flank of the Roberts Mountains. Henderson Creek and Vinini Creek are the larger watercourses. The area has relatively low flood inundation hazard because the area is in the upper reach of the catchment.

The segment would pass within 0.25 mile of one well and three springs, some of which are immediately downstream of the proposed corridor. Therefore, a potentially significant impact on water quality and flow conditions could occur. Special care should be taken during construction to implement mitigation measures Water 6A and 6B in those spring and well areas. Potential hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Segment G

Segment G, part of both the Crescent Valley (a) and Pine Valley (b) route alternatives, would cross the upper area of Kobeh Valley, which has internal drainage or is drained via Slough Creek to the enclosed drainage of Diamond Valley. The segment would cross 45 USGS blue-line watercourses, of which one is a low gradient watercourse. Slough Creek and remainder are medium gradient features draining the western slopes of the Whistler Range and the northern slopes of the Mountain Boy Range (e.g., Yahoo

Creek). The watercourses are entirely located on fan and/or pediment slopes. Flood hazards are generally not great, probably most significant in the floodplain of Slough Creek.

Segment G would pass within 0.25 mile of a spring and several ponds and two wells. Contamination from construction would be a potentially significant impact. Potential hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Segment I

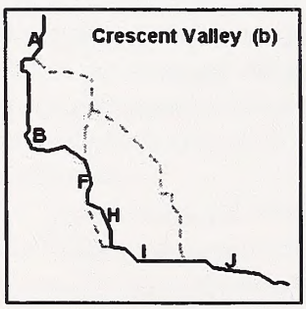
Segment I, part of all route alternatives except Buck Mountain, would cross the upper portion of Diamond Valley and Newark Valley, both of which have internal drainage. The segment would cross 31 USGS blue-line watercourses. Of that total, ten are low gradient features (including one braided channel), 12 gentle gradient watercourses, and 9 medium gradient watercourses. These watercourses drain the slopes of the Diamond Mountains and White Pine Mountains. The segment would traverse the Diamond Mountains, where some steep gradient watercourses are located. Flood hazard is generally low.

Segment I would pass within 500 feet of Simpson Springs (a locus of 7 springs) and Pinto Creek Spring. The segment also would pass within ¼ mile of a number of Muchacho Springs. It would pass within 500 feet of one well and a livestock watering tank. Contamination from construction would be a potentially significant impact. This is a sensitive resource area, and Mitigation Measures Water 1a – 1b and Water 6a – 6b should be given special attention in the COM Plan. The segment also passes within 0.5 to 4 miles of many springs. Potential hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Summary – Crescent Valley (a)

Crescent Valley (a) would cross 239 USGS blue-line watercourses, 4 springs within 500 feet, 4 wells within 500 feet, and 18 springs within 0.25 mile. The number of watercourse crossings is more than that of the Buck Mountain Route Alternative but less than that of the Pine Valley Routes. There is not a substantial difference with regard to the numbers of springs and wells between the alternatives. The most significant aspect of the route is the crossing of the Humboldt River and the hot springs area in Whirlwind Valley. Adverse impacts can be reduced to a less-than-significant level by implementing Mitigation Measure Water-1 through -9.

Crescent Valley (b) Route Alternative



The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a nearly identical alignment with the Crescent Valley (a) route, except that it uses Segment H rather than Segment G, traversing the east side of Whistler Mountain rather than the west. The Crescent Valley (b) route shares the impacts common to all route alternatives (i.e., Impact Water-1 through -9) and the impacts associated with Crescent Valley (a) route, except it would avoid any impacts in Segment G, described above. Segment H is described below.

Segment H

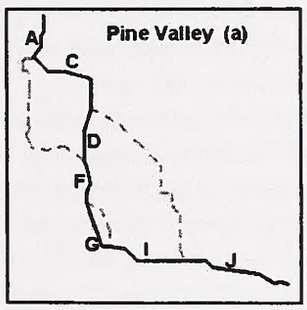
Segment H, part of both the Crescent Valley (a) and Pine Valley (b) route alternatives, would cross the upper portion of Diamond Valley, which has internal drainage. The segment would cross 30 USGS blue-line watercourses, of which 4 are low gradient, 21 are gentle gradient, and 5 are medium gradient. These watercourses drain the eastern slopes of Whistler Mountain and the northern slopes of the Mountain Boy Range. The watercourses are entirely located on fan and/or pediment slopes. Flood hazard is greatest in the floodplain of Slough Creek.

Segment H would pass within 0.25 mile of two wells, and contamination from construction would be a potentially significant impact. No springs are proximate to the segment. Potential hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Summary – Crescent Valley (b)

Crescent Valley (b) would cross 241 USGS blue-line watercourses, 12 springs within 500 feet, 5 wells within 500 feet, and 11 springs within 0.25 mile. The number of watercourse crossings is more than that of the Buck Mountain Route Alternative but less than that of the Pine Valley Routes. Crescent Valley (b) crosses fewer blue-line watercourses than Crescent Valley (a). There is not a substantial difference with regard to the numbers of springs and wells between the alternatives. Like Crescent Valley (a), the most significant aspect of the route is the crossing of the Humboldt River and a hot springs area in Whirlwind Valley. Potential adverse impacts can be reduced to a less-than-significant level by implementing Mitigation Measures Water-1 through -9.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B. In addition to the Impacts Common to All Route Alternatives described previously (i.e., Impacts Water-1 through -9), the Pine Valley (a) route would involve impacts associated with Segments C and D, as addressed below.

Segment C

Segment C, part of the Pine Valley and Buck Mountain route alternatives, would be located in Whirlwind Valley and Pine Valley, which drain into the Humboldt River. Pine Creek represents the most significant watercourse crossing of this segment. Most of the minor watercourse crossings have low to moderate gradients. Some of the crossings of watercourses in the Cortez Mountains have high gradients. Flood hazards occur in Scotts Gulch and at the crossing of Pine Creek. Flash flood hazard potentially may exist at the crossing of watercourses in Pine Valley draining the eastern side of the Cortez Mountains.

This segment would be located mostly in valley and alluvial fan areas with gentle to moderate stream gradients. The segment would cross 15 low gradient channels, 37 gentle gradient watercourses, 5 medium gradient watercourses, and 1 high gradient watercourse. The segment would cross three mountain or hill areas including the Cortez Mountains, Dry Hills, and the Malpais Mountains. The watercourses in these areas have mostly gentle to moderate gradients but include steep gradients locally.

The proposed transmission line would pass relatively close to a number of springs, including two thermal springs in Whirlwind Valley and springs in Scotts Gulch in the Dry Hills. Potential hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Segment D

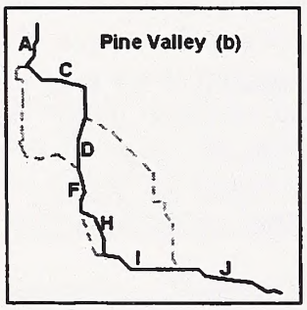
Segment D, part of the two Pine Valley route alternatives, would be located entirely in Pine Valley and the drainage into Pine Creek, a tributary of the Humboldt River. Pine Creek is the largest stream crossed by this segment. The segment crosses 13 low gradient, 12 gentle gradient, and 1 medium gradient channel, all small tributaries of Pine Creek that drain primarily the eastern slopes of the Cortez Mountains and the upper end of Pine Valley. The entire area is one of gentle gradient watercourses, mostly located on the valley floor. Flood hazard is most prevalent along Pine Creek. Minor flash flood hazard is

potentially present in the watercourses from Sheep Creek northward, which receive their source water in the Cortez Mountains and have somewhat steeper gradients. In general, the segment does not impinge closely on any springs or wells. Potential hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Summary – Pine Valley (a)

Pine Valley (a) would cross 271 USGS blue-line watercourses, 2 springs within 500 feet, 3 wells within 500 feet, and 19 springs/wells within 0.25 mile. This is the highest number of USGS blue-line watercourses crossed by any of the five route alternatives. There is no substantial difference between alternatives with regard to the number of springs and wells within 500 feet or within 0.25 mile. Like all alternatives, this route includes a crossing of the Humboldt River. This route avoids passing through a hot springs area. Potential adverse impacts can be reduced to a less-than-significant level by implementing Mitigation Measure Water-1 through -9.

Pine Valley (b) Route Alternative

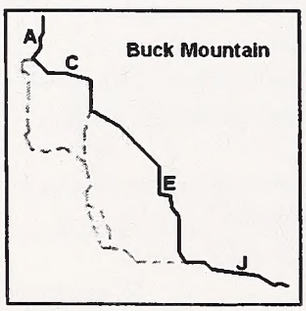


The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that it uses Segment H rather than Segment G, traversing the east side of Whistler Mountain rather than the west. The Pine Valley (b) route shares the impacts common to all route alternatives (i.e., Impact Water-1 through -9) and the impacts associated with Pine Valley (a) route, except it would involve impacts associated with Segment H rather than in Segment G, both of which are described above.

Summary – Pine Valley (b)

In summary, Pine Valley (b) would cross 256 USGS blue-line watercourses, 2 springs within 500 feet, 2 wells within 500 feet, and 18 springs/wells within 0.25 mile. The number of watercourse crossings is less than that for Pine Valley (a). There is no substantial difference between alternatives with regard to the number of springs and wells within 500 feet or within 0.25 mile. Like all alternatives, this route includes a crossing of the Humboldt River. This route avoids passing through a hot springs area. Potential adverse impacts can be reduced to a less-than-significant level by implementing Mitigation Measure Water-1 through -9.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. It shares the Impacts Common to All Route Alternatives (Impact Water -1 through –9). Buck Mountain is the only route that uses Segment E, which is described below.

Segment E

Segment E, which is only associated with the Buck Mountain route alternative, would cross Pine Valley and Huntington Valley, both of which are tributary streams of the Humboldt River. The segment also would cross Diamond Valley and Newark Valley, both of which have closed internal drainage. The segment would cross 103 USGS blue-line watercourses, most of which are small drainage features with gentle gradients on fan slopes and valley bottoms. The segment would cross 89 gentle gradient

watercourses and 14 low gradient channels (including one braided channel of Pine Creek). The largest stream crossings would be Pine Creek and Huntington Creek, both of which have relatively wide floodplain areas in the reaches where Segment E would cross. Pine Creek is a braided stream. Flash flood hazard is potentially present in the watercourses from Dry Creek (Sulphur Spring Range), Cherry Spring Canyon, and watercourses draining the Ruby Range and Diamond Mountains, as well as some watercourses draining the Buck Mountains. Watercourses that would be crossed in mountains areas of the Sulphur Spring Range, Pinyon Range, and Buck Mountains have mostly moderate gradients but locally steep gradients.

The segment would pass up-gradient and within 0.25 mile of the reservoir at Warm Springs Ranch. Construction activities could potentially impact the water quality of the reservoir. The segment would pass within 500 feet of a well near milepost 70 and come relatively close to a number of springs and wells, especially at Railroad Pass. The segment would come within about 0.3 mile of Wouldiams Spring. Special care should be taken during construction to implement Mitigation Measures Water 6A and 6B in those spring and well areas.

Potential hydrologic impacts and mitigation measures would be similar to those presented in Impacts Common to All Route Alternatives.

Summary – Buck Mountain

In summary, the Buck Mountain route alternative would cross 179 USGS blue-line watercourses, 2 springs within 500 feet, 3 wells within 500 feet, and 10 springs/wells within 0.25 mile. These numbers represent the fewest hydrological features associated with any of the route. Like the other alternatives, this Route would cross the Humboldt River and includes crossing the wide braided channel of Pine Creek. Potential adverse impacts can be reduced to a less-than-significant level by implementing Mitigation Measure Water-1 through -9.

Summary Comparison of Route Alternatives

TABLE 3.3-4: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Water-1: Potential Spills or Discharges During Construction	X	X	X	X	X
Impact Water-2: Erosion and Sediment from Construction	X	X	X	X	X
Impact Water-3: Potential Watercourse Obstruction	X	X	X	X	X
Impact Water-4: Soil Compaction and Increased Runoff	X	X	X	X	X
Impact Water-5: Potential Damage to Spring and Wells	X	X	X	X	X
Impact Water-6: Flash Flood Hazard to Towers	X	X	X	X	X
Impact Water-7: Access Road Impacts	X	X	X	X	X
Impact Water-8: Humboldt River Crossing Inundation Hazard	X	X	X	X	X
Impact Water-9: Potential Discharges to Humboldt River	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation, there would be minor residual impacts to water resources, principally sediment discharges following construction. With the applied mitigation, the sediment discharges would not be greater than background levels of sediment transport and deposition; therefore, the impact would be less-than-significant. As noted, if dewatering is required for construction, some impacts would be expected on nearby wells. Recovery of water levels may require some time, but most wells probably would have normal flow restored relatively rapidly. Therefore, the residual impact would be less-than-significant.

Towers placed on alluvial fans and in floodplains would be subject to residual hazards of inundation and possible damage from flash flooding. A severe flash flood or substantial stream flood event could tip a tower or damage it, which would potentially impair operation of the transmission line for a period of time The impact cannot be entirely eliminated by mitigation; however, mitigation identified in this EIS would provide an acceptable level of risk. Therefore, the impact is considered to be less-than-significant.

NO ACTION ALTERNATIVE

Under the No Action Alternative, potential impacts to hydrological resources associated with this project would not occur. However, hydrological impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

3.4 VEGETATION

This section addresses vegetation resources in the study corridor. It includes information on plant communities; waters of the U.S., including wetlands; and woodland and forest species with commercial value.

3.4.1 AREA OF ANALYSIS AND METHODOLOGY

The study corridor for vegetation resources consists of a minimum 500-foot wide survey corridor (i.e., 250 feet on each side of the centerline) along the five route alternatives. Information on the vegetation resources was obtained from a variety of sources including Ecological Status Inventory (ESI) data from BLM field offices; NRCS soil surveys (NRCS 1980a/b, 1989, 1992, 1997, 1998) and MLRA reports (NRCS Area 24, 25, 28B); references, including Rangeland Cover Types of the United States (Shiflet 1994), A Flora of Nevada (Kartesz 1988), Intermountain Flora Vascular Plants of the Intermountain West, U.S.A (Cronquist et al. 1986-1997), and Illustrated Flora of the Pacific States (Abrams 1981); and field surveys conducted by Summit Envirosolutions, under contract to SSPC (SEI 2000). Additional input was provided by resource agency staff from the BLM, Nevada Natural Heritage Program (NNHP) (personal communication with Carrie Carreno, Nevada Department of Conservation and Natural Resources, May 5, 1999), and the USFWS (Weaneyer 1999).

PLANT COMMUNITIES

Soil Surveys and MLRA descriptions from the NRCS, and ESI data from the Elko, Ely, and Battle Mountain BLM Field Offices were used to determine potential plant community types along the route alternatives. Soil survey maps and ESI maps identify several plant community types that can occur within a soil or ecological site complex. The Soil Surveys applicable to the project area include:

- Soil Survey of Diamond Valley Area, Nevada, 1980;
- Soil Survey of Elko County Area, Nevada Central Part, 1997;
- Soil Survey of Eureka County Area, Nevada, 1989;
- Soil Survey of Lander County Area, Nevada North Part, 1992;
- Soil Survey of Tuscarora Mountain Area, Nevada, 1980; and
- Soil Survey of Western White Pine County Area, Nevada, 1998.

NRCS MRLA reports applicable to the project area include:

- MLRA 24 Humboldt Area;
- MLRA 25 Owyhee High Plateau; and
- MLRA 28B Central Nevada Basin and Range.

A list of MRLA Range Sites, including correlated plant community types, with potential to occur within the project area is included in the Vegetation Survey report (SEI and Tetra Tech EMI 2000). Field surveys were conducted by three vegetation specialists between May 24 and July 15, 1999 and April 26 and 27, 2000 covering the proposed route alternative segments and re-routes (A through L). The survey corridor was at least 500 feet wide, extending at least 250 feet on each side of the proposed alignment centerline. The field surveys were conducted by driving, walking, and using binoculars. The vegetation specialists identified and mapped plant community types in the project study area on 1:24,000 scale, USGS 7.5-minute topographic maps. Plant community types rarely change abruptly along a discrete well-

defined line. Instead, they tend to merge into each other across an ecotone. However, for mapping purposes, boundary lines were drawn between the plant community types. Surveys were not conducted along access roads that might be improved outside of the 500-foot wide study corridor, since they were not known at the time of surveys. Surveys for sensitive resources along access roads would be conducted prior to construction, once a preferred route alternative is selected.

Special-status species field surveys were conduced on June 14, 15, 16, and 17, 1999 in areas identified by the plant community surveys as having potentially suitable habitat for special-status species. Special-status plant and wildlife species are addressed in Section 3.7. Plant species observed within these survey areas were identified and documented and are included in the survey report prepared by SEI and Tetra Tech EMI (2000).

Pinyon-juniper woodland was assessed in conjunction with the vegetation surveys to determine the average tree species composition in the project area. A series of five 300-foot transects were measured for frequency of pinyon and juniper stems at and near Henderson Summit to assist in determining stem densities and proportions of pinyons and juniper trees in mixed woodland. In addition, Robin Tausch, a regional paleoecologist, was consulted to provide information on the approximate density of stems in the woodland, based on his extensive surveys within the region (personal communication with Robin Tausch, U.S. Forest Service, April 11, 2000).

WETLANDS AND OTHER WATERS OF THE UNITED STATES

The extent of jurisdictional wetlands and other waters of the U.S. were estimated using maps and a reconnaissance survey. Wetland inventory data from National Wetland Inventory (NWI) maps were obtained from the USFWS and transferred to 7.5-minute USGS topographic quadrangle maps for field use. Potential wetlands were then identified and mapped in the field on the USGS quad maps, based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology.

Potential other waters of the U.S. were identified on 7.5-minute USGS topographic quadrangle maps. All drainages indicated as having perennial or intermittent flow on the USGS quads were identified as potential other waters of the U.S. Those drainages that cross any part of the proposed route alternative segments were tallied. This method was developed in consultation with the U.S. Army Corps of Engineers (USACE) Nevada Field Office (personal communication with Nancy Kang, USACE, June 4, 1999).

The USACE indicated that for construction and permit documents it would be necessary to determine the types of impacts that each drainage would receive due to project construction. A wetland delineation report was not conducted as part of this EIS. Once a preferred route alternative is selected, a full inventory of waters of the U.S., including wetlands, would be developed in accordance with the USACE Wetland Delineation Manual (USACE 1987) for final permit and construction documents. Results of this inventory would be included in a wetland delineation report.

This report would be submitted to the USACE for certification and would serve as a baseline for determining impacts to wetlands. The delineation report would also be part of the application package for the Section 404 permit needed to authorize fills to wetlands. Permit and construction documents would include tables that specify the type, length, and width of temporary and permanent impacts to jurisdictional waters of the U.S. All waters of the U.S. that would be affected by the project would be identified on construction and permit document maps. Permits would be obtained from the USACE for all discharges of fill material into waters of the U.S., including wetlands, before proceeding with a proposed action.

REGULATORY FRAMEWORK

This section summarizes the laws and regulations that apply to vegetation and wetland resources for the project. Wetland communities are considered valuable natural resources that provide habitat for a variety of dependent plant and wildlife species. The USACE and USFWS have policies and laws that regulate impacts on wetlands, as described below.

Clean Water Act, Section 404 – Definition of Wetlands

The USACE and the EPA regulate the placement of fill into "waters of the United States" under Section 404 of the federal Clean Water Act. Waters of the United States include lakes, rivers, streams and their tributaries, and wetlands. Wetlands are defined for regulatory purposes as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3, 40 CFR 230.3). For a wetland to qualify as jurisdictional by the USACE and therefore be subject to regulation under Section 404 of the Clean Water Act, the site must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology.

Other waters of the U.S. are sites that typically lack one or more of the three indicators for wetlands, listed above. Other waters of the U.S. in the project area include perennial and intermittent drainages that drain to navigable waters, such as rivers, streams, and other surface features with defined beds and banks (e.g., irrigation ditch reconfigured from a natural drainage that connected to a navigable water). Drainages that do not connect to navigable waterways are typically not defined as other waters of the U.S.

Project proponents must obtain a permit from the USACE for all discharges of fill material into waters of the U.S., including wetlands, before proceeding with a proposed action. The USACE may issue either individual permits on a case-by-case basis or general permits on a program level. General permits exist to cover similar activities expected to cause only minimal adverse environmental effects. Nationwide permits are a type of general permit that cover particular fill activities. All Nationwide permits have a general set of conditions that must be met for all projects and specific conditions that apply to particular projects.

Executive Order 11990: Protection of Wetlands

The federal government supports a policy of minimizing "the destruction, loss, or degradation of wetlands" (Executive Order 11990, May 24, 1977). The Order directs all federal agencies to refrain from assisting or giving financial support to projects that encroach on public or privately owned wetlands.

Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMP) of 1976 directs BLM to manage public lands in a manner that will provide for multiple use and at the same time protect natural resources for generations to come. In addition to FLPMA, numerous laws, regulations, policies, Executive Orders, and Memoranda of Understanding direct BLM to manage its riparian/wetland areas for the benefit of the nation and the economy. The BLM Manual 1737 for Riparian-Wetland Area Management identifies marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands.

3.4.2 AFFECTED ENVIRONMENT

PLANT COMMUNITIES IN THE STUDY AREA

The Basin and Range Region consists of many parallel rows of north-south trending mountain ranges separated by alluvium-filled valleys and intermontane basins. Geographically, the Basin and Range Region occupies most of Nevada, along with margins of Oregon, Idaho, Utah, Arizona, Wyoming, and California. The topography of the project area varies from flat alkaline valleys to steep mountains, and the elevation ranges from approximately 4,650 to 7,600 feet. Vegetation in the project area and in the Great Basin in general consists of primarily three major vegetation communities: sagebrush, salt desert scrub, and pinyon-juniper woodland. Low elevation alkaline soils with little rainfall tend to be characterized by salt desert scrub in dry lakebeds and playas. Middle to higher elevation areas that receive over 7 inches of moisture yearly tend to be characterized by sagebrush. At still higher elevations with more rain or snowfall, the sagebrush transitions into pinyon-juniper woodlands.

Twelve plant community types were identified within the project area, along with some areas that were designated as "developed or disturbed" land. In addition to these plant communities, areas qualifying as jurisdictional wetlands and other waters of the U.S. were identified. As a result of the 1999 and 2000 fires, portions of some plant communities were altered. These areas are discussed under Fire Affected Communities. Table 3.4-1 is a summary of the characteristic plant species by plant community type. The plant communities include Basin big sagebrush, mountain big sagebrush, Wyoming big sagebrush, black sagebrush, low sagebrush, salt desert shrub, pinyon-juniper woodland, greasewood, riparian, winterfat, crested wheatgrass, cultivated, and developed/disturbed.

Of these, all five sagebrush communities, salt desert shrub, and pinyon-juniper woodland are plant communities that are locally and regionally common, but which may provide important habitat for sensitive wildlife species, including sage grouse. Portions of riparian communities and other areas that qualify as wetlands, and waters of the U.S., are protected under Section 404 of the Clean Water Act. Riparian communities that do not qualify as wetlands are still considered important since they provide important habitat value for common and sensitive wildlife species. Crested wheatgrass, cultivated, and developed/disturbed communities are altered plant communities that generally provide lower habitat value to sensitive wildlife species than the natural communities.

Plant community descriptions were based on descriptions provided in Rangeland Cover Types of the United States (Shiflet 1994), and modified according to findings from the field surveys. The Rangeland Cover Types categorize community types in order of dominance (shrubs or overstory) and subdominance (grasses and forbs). The plant community classification system, as provided in Shiflet (1994) was selected over other classification systems (e.g., Cronquist et al. [1986-1997] and The Nature Conservancy's *Terrestrial Vegetation of the United States* [The Nature Conservancy 1988]) because it is more detailed than the others and best determines potential habitat for wildlife, especially sage grouse.

The mapped vegetation types are generally consistent with type descriptions in Shiflet (1994). The dominance was typical of the types as well as the associated forbs and grasses. Cheatgrass (*Bromus tectorum*) was found throughout the project area but was generally not extensive. However, in the northeastern portion of the study area (e.g., Crescent Valley area), cheatgrass is now extensive.

Exceptions to the plant community descriptions occurred in areas that had been previously burned and are recovering, and areas of private land that may be heavily grazed but whose basic vegetation type had not been altered. Some areas contained non-native components such as cheatgrass, Russian thistle (*Salsola tragus*), and tumble mustard (*Sisymbrium altissimum*). These include areas around Beowawe and in Crescent Valley.

TABLE 3.4-1: PLANT COMMUNITY TYPES AND CHARACTERISTIC PLANTS

Plant Community	Characteristic Plant Species
Basin Big Sagebrush	Basin big sagebrush is the predominant shrub. Other characteristic species include shrubs such as gray horsebrush, and grasses such as squirreltail and Great Basin wildrye.
Mountain Big Sagebrush	Mountain big sagebrush is the predominant shrub. Other characteristic species include shrubs such as Morman tea and snakeweed, and grasses such as Indian ricegrass, Great Basin wildrye, and Sandburg's bluegrass, and forbs.
Wyoming Big Sagebrush	Wyoming big sagebrush predominates. Other characteristic species include shrubs such as snakeweed, grasses such as squirreltail and Indian ricegrass, and forbs.
Black Sagebrush	Black sagebrush is the dominant shrub. Other characteristic species include grasses such as Sandburg's bluegrass, Indian ricegrass, and squirreltail, and forbs.
Low Sagebrush	Low sagebrush is the dominant shrub. Other characteristic species include grasses such as squirreltail and Sandburg's bluegrass, and forbs.
Salt Desert Shrub	Shadscale, black greasewood, and winterfat are the predominant shrubs in this sparsely vegetated plant community.
Winterfat	Winterfat is the dominant shrub, with smaller amounts of shadscale. This community is usually found as an inclusion in the salt desert shrub plant community.
Greasewood	Black greasewood is the dominant shrub. Some seasonally ponded areas within this community may qualify as jurisdictional wetlands.
Crested Wheatgrass	Crested wheatgrass is the dominant species, and is usually found within one of the big sagebrush or greasewood plant community types. It is often a temporary plant community that is generally used to increase perennial grass cover and fire resistance.
Pinyon-Juniper Woodlands	Utah juniper and pinyon pine are the dominant species, with understory species similar to adjacent shrub communities.
Cultivated	Alfalfa fields, small grain fields, and cultivated pastures.
Riparian	Characteristic species include sedges, rushes, creeping wild rye, ruderal (weedy) species such as common mullein and horehound, and occasional shrubs such as coyote willow and wild rose. Some areas include invasive weeds, primarily hoary cress. Some areas within this community may also qualify as jurisdictional wetlands.
Developed / Disturbed	These areas are mostly unvegetated (e.g., roads, gravel pits, buildings). Where vegetation occurs it is generally characterized by weedy species such as cheatgrass and tumble mustard.
Fire Affected Communities	Plant communities that burned in the summer of 1999 and 2000. Many areas were reseeded following the fires to re-establish perennial vegetation (BLM 1999a).

Invasive weeds were present infrequently and were generally associated with road features and heavily impacted private pasture lands (see Section 3.5 for a discussion of invasive weeds). The town of Eureka is an exception, however. Nearly all roads and drainages within and surrounding Eureka have populations of hoary cress (*Cardaria draba*).

Few areas in the Great Basin have not been altered by human presence; as a result, the route alternative segments contain evidence of human alterations varying from the grazing of range animals, wild horses, mining activities, fire frequency changes, and dredging activities such as along the Humboldt River. Despite these perturbations, however, few areas were extensively ruderal (weedy), and the majority of the

segments are relatively healthy. Cryptogamic soils were found throughout the project area and were found associated with both Wyoming big sage and mountain big sage. These soils are characterized by a crust formed by plants and plant-like organism that lack water-conducting vascular tissue, flowers, and are not reproduced by seeds. Cryptogamic soils affect various soil characteristics (i.e., moisture, erodibility, etc.), and may be somewhat resistant to invasion by many weeds. Grazing cattle and wild horses have impacted cryptogamic soil integrity in certain areas (e.g., Pine Valley).

Basin Big Sagebrush Community

The Basin big sagebrush (*Artemisia tridentata* var. *tridentata*) community occurs on less than 2% of the land area in the study corridor. The Basin big sagebrush community occupies areas with deep permeable soils generally associated with drainages and valley bottoms. It occupies areas of 8- to 14-inch annual precipitation and was mapped at elevational ranges between 5,600 and 7,000 feet. The community is dominated by Basin big sage and grasses. Other shrub species including rubber rabbitbrush (*Chrysothamnus nauseousus*) and green rabbitbrush (*C. vicidiflorus*), gray horsebrush (*Tetradymia canescens*), and Heerman buckwheat (*Eriogonum heermannii*) are also present. Forbs include milkvetch species (*Astragalus* spp.), Douglas pincushion (*Chaenactis douglasii*), crypthantha (*Cryptantha flavoculata*), and Basin butterweed (*Senecio multilobatus*). Grasses include squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), and Great Basin wildrye (*Elymus cinereus*).

Mountain Big Sagebrush Community

The mountain big sagebrush (*Artemisia tridentata* var. *vaseyana*) community occurs in about 5% of the land area in the study corridor. The mountain big sagebrush community occupies areas of greater precipitation ranging from 14 to 18 inches per year and is located in areas of well-drained, deep permeable soils. Mountain big sage is generally found at higher elevations than the other big sage communities. It was mapped at elevational ranges from 5,700 to 7,400 feet, but may also be found at elevations above 10,000 feet. The community is dominated by mountain big sage and grasses. Other shrubs are also present, such as rubber and green rabbitbrush, desert peach (*Prunus andersonii*), Mormon tea (*Ephedra viridis*), snakeweed (*Guitzerzia sarothrae*), and gray horsebrush. Forbs include astragalus species, hookers, and arrowleaf balsamroot (*Balsamhoriza hookerii* and *B. sagittata*), phlox (*Phlox hoodii*), spurred lupine (*Lupinus argenteus*), mat buckwheat (*Eriogonum cespitosum*), and desert paintbrush (*Castilleja chromosa*). Grasses include squirreltail, Indian rice grass, Great Basin wildrye, Thurber's needlegrass (*Stipa thurberiana*), Sandburg's bluegrass (*Poa segunda*), and needle-and-thread grass (*Hesperostipa comata*).

Wyoming Big Sagebrush Community

The Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*) community is by far the most prevalent plant community type in the study area, occurring in about 45% of the study corridor. The Wyoming big sagebrush community is found at lower elevations than the other big sagebrush communities, in areas of low precipitation (8 to 12 inches) and shallow stony soils. It was mapped at elevations between 4,600 and 6,800 feet. The community is dominated by Wyoming big sage and grasses. Small amounts of snakeweed are also present. Forbs and grass species include species of buckwheat (*Eriogonum* spp.), arrowleaf balsamroot, phlox (*Phlox hoodii* and *P. longifolia*), current leaf desert mallow (*Spaeralcea grossularifolia*), Douglas pincushion, squirreltail, Indian rice grass, and Sandburg's bluegrass.

Black Sagebrush Community

The black sagebrush (*Artemisia nova*) community occurs in about 15% of the study corridor. The black sagebrush community is generally found in areas with shallow, very rocky soils but within the same climatic variances of the big sagebrush community types. The black sagebrush community was mapped at elevations around 7,000 feet. The community is dominated by black sage, and is also characterized by grasses including Sandburg's bluegrass, Indian ricegrass, and squirreltail. Forbs include buckwheat species, hairy fleabane (*Erigeron pumilus*), goldenweed (*Haplopappus nanus* and *H. acaulis*), lovage (*Lomatum* spp.), bitterroot (*Lewisia rediviva*), Pursh's milkvetch (*Astragalus purshii.*), or other milkvetch species, and

bladderpod (*Physaria chambersii*). Mountain snowberry (*Symphoricarpos oreophilus*) and bitterbrush (*Purshia tridentata*) were found in this community, but only rarely (e.g., along the east side of the Diamond Mountains).

Low Sagebrush Community

The low sagebrush (*Artemisia arbuscula*) community occurs in less than 2% of the study corridor. The low sagebrush community is generally found in areas of shallow soils with low precipitation of 8 to 16 inches. Low sagebrush was mapped at elevations between 5,600 to 7,000 feet. Low sagebrush was found interspersed within the big sagebrush communities, most notably interspersed within the Wyoming big sagebrush community. The community is dominated by low sage and is also characterized by grasses and forbs, including Sandburg's bluegrass, squirreltail, lovage, buckwheat species, phlox, balsamroot, milkvetch, goldenweed, and short-stemmed lupine (*Lupinus brevicaulis*).

Salt Desert Shrub Community

The salt desert shrub community occurs in about 15% of the study corridor. The salt desert shrub community occupies valley floors in areas of tight (i.e., clay) soils that are seasonally saturated and contain high amounts of salts. The community is found in the lowest elevations of the project area. The salt desert shrub community is characterized primarily by a mix of one or more chenopods including shadscale (*Artiplex confertifolia*), greasewood (*Sarcobatus vermiculatus*), and winterfat (*Krascheninnikovia lanata*). Other shrubs typical of this community include four-wing salt bush (*Atriplex canescens*), budsage (*Artemisia spinescens*), and green rabbitbrush. Grasses and forbs associated with this community include saltgrass (*Distichlis spicatum*), squirreltail, Great Basin wildrye, and desert mallow. In some areas, such as Whirlwind Valley, invasive species such as Russian thistle (*Salsola kali*), kochia (*Kochia scoparia*), clasping pepperweed (*Lepidium perfoliatum*), and halogeton (*Halogeton glomeratus*) occur.

Winterfat Community

The winterfat (*Krascheninnikovia lanata*) plant community occurs in only about 0.3% of the study corridor. The winterfat community occurs as inclusions or areas around the salt desert shrub community type. This community type is dominated by winterfat and is also characterized by Indian ricegrass and shadscale. The winterfat community is generally located on alluvial flats and lake plains but contains soils that are relatively better drained than in the salt desert shrub community.

Greasewood Community

The greasewood (*Sarcobatus vermiculatus*) community occurs in about 6% of the study corridor. The greasewood community occurs in alluvial flats, similar to the salt desert shrub and winterfat communities. Unlike those communities, the greasewood community occurs on poorly drained soils, which can result in seasonal ponding of water. Greasewood is the dominant species and is well-adapted to ponding and poor drainage, as well as the alkali salt and sodium content of these soils. Forbs, grasses, and other shrubs are generally sparse in the greasewood community but include Great Basin wildrye, inland saltgrass, shadscale, and other halophytes.

Some seasonally ponded areas within this community may qualify as wetlands subject to the jurisdiction of the USACE if they are characterized by hydrophytic vegetation, hydric soils, and wetland hydrology. See Wetlands and Riparian Communities, below, for a discussion of potential wetlands in the study area.

Crested Wheatgrass Community

The crested wheatgrass (*Agropyron cristatum*) community occurs in about 2% of the study corridor. Crested wheatgrass is seeded into big sagebrush or greasewood community types, and is generally used to increase forage cover and fire resistance. The occurrence of the crested wheatgrass community may have increased in some burned areas as a result of emergency fire rehabilitation efforts made after the fires in the summer of 1999.

Pinyon-Juniper Woodland Community

The pinyon-juniper woodland community occurs in about 13% of the study corridor. Pinyon-juniper woodland generally occupies elevational ranges of 5,000 to 8,000 feet. In the study area, woodland occurs from about 5,000 feet to the upper limits of the route alternative segments; however, most of the woodland occurs above 6,000 feet. Lower elevations are dominated by Utah juniper (*Juniperous osterosperma*), while pinyon (*Pinus monophylla*) increases in importance with elevation. From approximately 6,000 to 7,400 feet, the composition was found to be 56% juniper and 44% pinyon. This was based on five transects taken at and near Henderson Summit.

Most of the pinyon-juniper woodland in the project area is at the higher elevations (e.g., approximately 6,000 to 7,400 feet) and is characterized by a mixture of 56% percent Utah juniper trees and 44% pinyon trees. However, there are some exceptions. Two woodland locations on the Cold Creek Ranch NW quadrangle consist entirely of juniper trees. In addition, trees in one pinyon-juniper woodland in Segment E (Mooney Basin Summit Quad.) had been harvested. This was noted during the vegetation survey. Based on surveys within the region, pinyon-juniper woodland is generally characterized by a density of about 100-200 stems per acre (personal communication with Robin Tausch, U.S. Forest Service, April 11, 2000).

The understory component of the pinyon-juniper woodland is dependent on both the stand and the elevation. However, the woodland is generally characterized by sparser understory vegetation cover than found in most of the other plant communities. The woodland is characterized by a variable distribution of shrubs, including mountain big sage, low sage, rabbitbrush, and wax current (*Ribes cereum*). Additional shrubs that occur less frequently include mountain mahogany (*Cercocarpus ledifolius*), bitterbrush, and serviceberry (*Amelanchier alnifolia*). Characteristic forbs and grasses include penstemons (*Penstemon* spp.), hairy wild cabbage (*Caulanthus pilosus*), arrowleaf balsamroot, buckwheats, Thurber's needlegrass, Sandburg's bluegrass, squirreltail grass, and wheatgrasses (*Agropyron* spp.).

Cultivated Land

Cultivated areas include irrigated hay meadows, alfalfa fields, or other crops. Cultivated lands occur in less than 1% of the study corridor.

Developed/Disturbed Community

Developed and disturbed lands occur in less than 1% of the study corridor. Developed and disturbed areas include roads, gravel pits, buildings, parking lots, and other developed areas. Where a vegetation component occurs, it is generally ruderal (i.e., characterized by cheatgrass, tumble mustard, and other introduced weedy species).

Fire-Affected Communities

In the summer of 1999, over 1.7 million acres of Great Basin lands, primarily in Nevada, were burned in one of the worst fire seasons since the 1940s. Additional fires occurred in 2000. These fires have raised concerns about major transformations occurring in Great Basin ecosystems that affect the region's natural resources, as well as economic and social health. While fire is a natural component of the Great Basin plant communities, the frequency and pattern of fires have changed in post-settlement times.

The interplay of grazing practices, invasive species (e.g., cheatgrass), fire suppression, and post-fire management practices all have contributed to changes in fire frequencies and intensities. These, in turn, have contributed to a changing landscape with many implications. Issues of concern raised in response to the 1999 fires include loss of native plant communities, stability of watersheds and soils, declining wildlife habitat, increase of noxious weeds and exotic annual grasses, reduced livestock grazing, loss of recreational opportunities, and more dangerous and expensive wildland firefighting (BLM 1999b).

Figure 3.4-1 shows areas in the project area that burned during the 1999 and 2000 fires. These fires took place after the baseline field survey data were collected for this project. The burn areas in the study corridor had contained mostly sagebrush, along with some pinyon-juniper woodlands on Segment J. Many fire-affected areas have undergone varying degrees of revegetation since the 1999 burns (BLM 1999a).

WETLANDS AND RIPARIAN COMMUNITIES

Wetlands and Other Waters of the U.S.

Potential wetlands were found in the study area at the Humboldt River crossing and near the top of Segment B. The Humboldt River potential wetland area occurs within a riparian plant community, and the potential wetland near Segment B occurs within a greasewood plant community. Potential wetlands are shown in the oversized maps in the Vegetation Survey Report (SEI and Tetra Tech EMI 2000) available at the BLM Ely, Battle Mountain, and Elko Field Offices. Although field surveys were not conducted specifically to identify waters of the U.S., the field surveys that were done for vegetation and wildlife resources (SEI and Tetra Tech EMI 2000) indicated that the number of crossings of Blue-line watercourses shown on the USGS topographic quadrangle and tallied in Table 3.3-2 in Section 3.3, Water Resources, are overestimated. Many of the water courses shown on the 7.5-minute USGS maps used to identify other waters of the U.S. in the project area do not meet the definition of jurisdictional waters of the U.S., since they do not connect with navigable waterways. Other potential waters of the U.S. are shown in the oversized Vegetation Survey report maps (*Ibid*).

Riparian Communities

Riparian communities occur in less than 1% of the study corridor. High quality riparian habitat can generally support more species than many other habitat types because of the presence of water and a productive, nutrient-rich environment. Due to substantial historic losses of this habitat type, many species dependent on riparian habitat are now considered rare, and several of these are now legally protected, or are being considered for protection, under federal endangered species laws. In the project area, however, most of the riparian communities have been disturbed and the habitat is degraded. Where riparian communities occur along drainages, they are generally avoidable via nearby bridges for vehicle access.

Riparian communities in the project area are associated with seasonal or perennial water sources. They vary in their vegetation characteristics. However, nearly all drainages and any associated riparian communities (both intermittent and perennial streams) show evidence of disturbance, whether from grazing by livestock, the driving of vehicles through streams, or dredging activities associated with improving the flow of a watercourse.

Some of the drainages are characterized by sedges (*Carex* spp.), occasional coyote willow (*Salix exigua*), wild rose (*Rosa woodsii*), yellow currant (*Ribes aureum*), and serviceberry. In addition, there are a variety of forbs such as monkey flower (*Mimulus gutattus*), sheep sorrel (*Rumex crispis*), common dandelion (*Taraxacum officinale*), and stinging nettles (*Utrica dioica*).

Most of the riparian areas occur on private lands generally used by range animals for grazing. These riparian communities are often disturbed wet meadows and pastures characterized by a high percentage of ruderal vegetation. Vegetation associated with these wet meadows includes sedges, rushes (*Juncus* spp.), arrowgrass (*Triglochin concinna* var. *debilis*), creeping wildrye (*Elymus triticoides*), mat muhly (*Muhlenbergia richardsonis*), sticky cinquefoil (*Potentilla glandulosa*), common dandelion, common yarrow (*Achellia millefolium*), and occasional coyote willow. The ruderal component ranges from native and non-native species to noxious weeds. Non-native species include common mullein (*Verbascum thapsis*), tansy mustard (*Descurainia pinnata*), and non-native horehound (*Marrubium vulgare*). Invasive weeds include

Russian knapweed (*Centaurea repens*), Canada thistle (*Cirsium arvense*), and hoary cress (*Cardaria draba*). The Russian knapweed and Canada thistle were located in a few of the wet meadows but were not mapped as they were outside the 500-foot wide survey corridor. Hoary cress was mapped with a high frequency. Invasive weeds are discussed in detail in Section 3.5 of this EIS.

At the proposed Humboldt River crossing, the riparian community is affected by what appears to be one of the most disturbed stretches of the river. The river channel shows signs of dredging and flooding activities. Haul-pack tires were placed in the river, presumably to allow access across the river. Piles of backfilled dirt from these activities were placed along the banks. The vegetative component was predominantly ruderal with dead willow stands as indicators of an apparently lowered water table. The ruderal species were similar to those species listed above.

Portions of a riparian community could qualify as jurisdictional wetlands subject to the jurisdiction of the USACE.

3.4.3 ENVIRONMENTAL CONSEQUENCES

This section contains a discussion of the potential impacts of the project on vegetation resources, including wetlands and riparian communities. Discussions of potential impacts to special-status plant species are provided in Section 3.7, in Section 3.5 for invasive nonnative species (e.g., noxious weeds and cheatgrass), and Section 3.6 for wildlife and wildlife habitat.

SIGNIFICANCE CRITERIA

The following general criteria were considered in determining whether an effect on vegetation resources would be significant:

- 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 resource;
- Magnitude of the disturbance, loss, or effect (e.g., substantial/not substantial); and
- Susceptibility of the affected resource to disturbance.

Based on the NEPA Guidelines and the general criteria identified above, effects on vegetation resources were considered significant if the project would result in any of the following:

- Long-term degradation of a sensitive plant community because of substantial alteration of landform or site conditions (e.g., alteration of wetland hydrology);
- Filling or degradation of wetlands and other waters of the U.S. subject to the jurisdiction of the USACE pursuant to the federal Clean Water Act;
- Substantial loss of a plant community and associated wildlife habitat; and
- Fragmentation or isolation of plant communities with important wildlife habitat values, especially riparian and wetland communities.

Sierra Pacific Power Co.

FALCON to GONDER Project

Fires in 1999 and 2000

Fire Perimeters

1999

2000

TRANSMISSION LINES

Route Alternatives

Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320

(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30

Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco

04/25/01

SOURCES: US Bureau of Land Management / Stantec Consulting, Inc. (1998-2000) / Nevada —Bureau of Mines & Geology GIS / USGS —DEM SOURCES: BLM GIS 1999-2000 / Stantec Consulting, Inc. 1998-2000 /

Figure 3.4 - 1

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Direct effects on vegetation resources would include temporary and permanent habitat loss associated with construction, operation, and maintenance of the project (e.g., substation expansions, tower structure installation, and a centerline travel route). Indirect effects could result from providing increased access to an area. Some effects would be temporary, occurring during construction, while others would be long-term (e.g., loss of vegetation at tower sites).

Impacts Common to all Route Alternatives

The following section presents impacts to vegetation resources, including wetlands and riparian communities, that would be common to all of the route alternatives.

Vegetation resources could be directly and indirectly affected by construction, operation and maintenance activities. In general, these impacts can be avoided or, where unavoidable, minimized to the extent that they can be successfully mitigated. Construction, operation and maintenance activities that could result in the direct or indirect loss or degradation of vegetation resources include:

- Excavations for towers and anchors;
- Blading and grading of soil for vehicle access and construction areas at tower sites;
- Tree removal and mowing vegetation where needed for construction vehicle access, tower installation, and necessary electrical clearance;
- Temporary stockpiling of soil or construction materials and sidecasting of soil and vegetation;
- Use of designated construction material yards;
- Soil compaction and dust;
- Equipment access through nonsensitive stream channels (defined as streams that do not support sensitive species, critical habitat, or woody riparian vegetation);
- Vehicle traffic and equipment and materials transport along the centerline travel route and construction areas;
- Temporary parking of vehicles outside the construction zone on sites that support sensitive resources (sites not designated as construction material yards); and
- Use of the 12-foot wide centerline travel route for annual line inspections by SPPC workers on ATVs and for as-needed maintenance and emergency repairs.

❑ ***Impact Vegetation-1: Temporary Disturbance and/or Loss of Upland and Altered Plant Communities from Construction***

Construction activities would result in the temporary disturbance and/or loss of unburned and recently burned Basin big sagebrush, mountain big sagebrush, Wyoming big sagebrush, black sagebrush, low sagebrush, salt desert shrub, winterfat, pinyon-juniper woodland, greasewood, crested wheatgrass, cultivated, and developed/disturbed plant communities. Estimates of total construction-related ground disturbance are provided in Table 2-3, in Chapter 2. Table 3.4-2 indicates the types of plant communities that would be impacted by the 30-foot wide (maximum) centerline travel route.

TABLE 3.4-2: ESTIMATED TEMPORARY DISTURBANCE TO PLANT COMMUNITIES BY SEGMENT AND ROUTE ALTERNATIVE WITHIN 30-FOOT CENTERLINE TRAVEL ROUTE (ACRES /PERCENT OF TOTAL AREA)

Segment		Basin Big Sagebrush	Mountain Big Sagebrush	Wyoming Big Sagebrush	Black Sagebrush	Low Sagebrush	Salt Desert Shrub	Winterfat	Grease-wood	Crested Wheat-grass	Pinyon-Juniper	Cultivated	Riparian	Developed / Disturbed	Hoary Cress / Other Noxious Weeds	Total Segment Corridor
A	Acres	--	--	11.1	-	--	41.2	--	7.2	--	--	--	0.9	--	0.3	**60.8**
	%	--	--	18.3%	--	--	67.8%	--	11.8%	--	--	--	1.5%	--	0.6%	**100%**
B (via L)	Acres	0.3	0.3	102.2	24.1	1.4	60.4	--	27.3	3.1	6.4	--	--	--	0.4	**225.9**
	%	0.1%	0.2%	45.2%	10.6%	0.6%	26.7%	--	12.1%	1.4%	2.8%	--	--	--	0.2%	**100%**
C	Acres	--	--	77.8	1.6	6.1	22.4	--	10.7	11.3	--	--	--	--	--	**129.9**
	%	--	--	59.9%	1.2%	4.7%	17.2%	--	8.3%	8.7%	--	--	--	--	--	**100%**
D	Acres	--	--	47.8	2.3	--	--	--	11.7	9.2	--	--	--	--	0.01	**71.0**
	%	--	--	67.4%	3.3%	--	--	--	16.4%	12.9%	--	--	--	--	0.0%	**100%**
E	Acres	10.7	20.9	149.0	39.6	0.6	--	--	3.2	4.4	43.4	--	--	--	--	**271.9**
	%	3.9%	7.7%	54.8%	14.6%	0.2%	--	--	1.2%	1.6%	16.0%	--	--	--	--	**100%**
F	Acres	--	3.0	36.4	10.4	--	--	--	--	--	9.6	--	1.7	--	--	**61.1**
	%	--	5.0%	59.6%	17.0%	--	--	--	--	--	15.7%	--	2.7%	--	--	**100%**
G	Acres	--	2.6	49.0	14.9	--	--	--	1.3	--	4.6	--	--	--	--	**72.4**
	%	--	3.5%	67.7%	20.6%	--	--	--	1.7%	--	6.4%	--	--	--	--	**99.9%**
H	Acres	--	6.8	50.0	6.6	--	--	0.6	--	--	10.0	--	--	--	--	**74.0**
	%	--	9.2%	67.6%	9.0%	--	--	0.8%	--	--	13.5%	--	--	--	--	**100%**
I	Acres	--	15.0	26.3	21.8	2.0	17.1	0.3	11.3	1.4	10.7	2.7	0.2	0.7	0.7	**110.3**
	%	--	13.6%	23.8%	19.8%	1.8%	15.5%	0.3%	10.2%	1.3%	9.7%	2.4%	0.2%	0.7%	0.7%	**100%**
J	Acres	--	10.2	45.9	34.6	--	--	1.3	0.4	4.8	48.5	--	--	--	0.01	**145.7**
	%	--	7.0%	31.5%	23.8%	--	--	0.9%	0.3%	3.3%	33.3%	--	--	--	0.0%	**100%**
ROUTE ALTERNATIVE																
Crescent Valley																
(a)	Acres	0.3	31.1	270.9	105.8	3.4	118.8	1.6	47.4	9.3	79.8	2.7	2.8	0.7	1.5	676.1
	%	0.0%	4.6%	40.1%	15.6%	0.5%	17.6%	0.2%	7.0%	1.4%	11.8%	0.4%	0.4%	0.1%	0.2%	100.0%
(b)	Acres	0.3	35.4	271.9	97.5	3.4	118.8	2.2	46.1	9.3	85.1	2.7	2.8	0.7	1.5	677.8
	%	0.0%	5.2%	40.1%	14.4%	0.5%	17.5%	0.3%	6.8%	1.4%	12.6%	0.4%	0.4%	0.1%	0.2%	100.0%
Pine Valley																
(a)	Acres	0.0	30.8	294.3	85.6	8.1	80.7	1.6	42.5	26.7	73.4	2.7	2.8	0.7	1.1	651.1
	%	0.0%	4.7%	45.2%	13.1%	1.2%	12.4%	0.3%	6.5%	4.1%	11.3%	0.4%	0.4%	0.1%	0.2%	100.0%
(b)	Acres	0.0	35.0	295.3	77.4	8.1	80.7	2.2	41.2	26.7	78.8	2.7	2.8	0.7	1.1	652.8
	%	0.0%	5.4%	45.2%	11.8%	1.2%	12.4%	0.3%	6.3%	4.1%	12.1%	0.4%	0.4%	0.1%	0.2%	100.0%
Buck Mountain																
	Acres	10.7	31.1	283.7	75.9	6.8	63.6	1.3	21.5	20.6	92.0	0.0	0.9	0.0	0.4	608.3
	%	1.8%	5.1%	46.6%	12.5%	1.1%	10.5%	0.2%	3.5%	3.4%	15.1%	0.0%	0.1%	0.0%	0.1%	100.0%

- *Long-term impacts cannot be determined at this time because tower locations are unknown.*
- *Temporary habitat loss includes primarily clearing activities along the 30-foot wide (maximum) centerline travel route, spur roads, pole assembly and erection areas, and crane pads.*

Source: EDAW GIS using Stantec digital data of 1999-2000 field surveys (SEI and Tetra Tech EMI 2000)

During and after construction, SPPC would implement the activities described in the Reclamation Plan (Appendix E). Mowed areas regrow and achieve reclamation goals substantially faster than bladed areas (KEA 2000). Due to the relative abundance of the affected community types within the region, the relatively small area of temporary disturbance, and the reclamation activities that would be conducted, the impact would be adverse but less-than-significant. However, Mitigation Measure Vegetation-1 described below would further minimize this impact.

❑ ***Mitigation Measure Vegetation-1:***

The following would be implemented to reduce construction disturbances to and maximize recovery of plant communities.

- Pre-construction surveys of the potential disturbance areas, access roads, and material yards would be conducted to ensure that sensitive plant communities and invasive weed infestation areas are avoided or mitigated (e.g., erosion and weed control, reseeding).
- During construction, travel would be restricted to the shortest feasible path to minimize environmental impacts while traveling along the access roads, spur roads, centerline travel route, and 500-foot study corridor. As explained in Chapter 2, in some areas, it may be necessary to travel outside the 500-foot corridor; however, this would be kept to a minimum. Construction activity and travel protocols would be clearly specified in the COM Plan.
- Construction activities would be restricted when the soil is too wet to adequately support construction or maintenance equipment. If equipment creates excessive ruts in wet or saturated soils as determined by the BLM Compliance Inspector and/or SPPC's Environmental Compliance Monitor, the soil shall be deemed too wet to adequately support standard construction or maintenance equipment. Where the soil is deemed too wet, Mitigation Measures Vegetation-6 (a-c), Vegetation-7, and Soil-1 apply.
- Vegetation removal would be minimized wherever possible and would be restricted in sensitive resource areas (e.g., areas in erodible soils, sensitive biological resources). These areas would be delineated, staked, and flagged in the field by a qualified resource specialist, and would be specified in the COM Plan. Blading and grading may be required in some areas due to personnel safety and equipment operating requirements. These areas would be primarily on steeper slopes or in rocky terrain.

❑ ***Impact Vegetation-2: Long-term Loss of Upland Plant Communities***

Long-term loss of upland plant communities would result from the construction, operation, or maintenance of the transmission line and substation expansion areas. Direct losses of Basin big sagebrush, mountain big sagebrush, Wyoming big sagebrush, black sagebrush, low sagebrush, salt desert shrub, winterfat, pinyon-juniper woodland, and greasewood plant communities would occur through construction of substation facilities, towers, and use of the 12-foot wide centerline travel route for annual line inspections and as-needed maintenance.

These long-term impacts cannot be summarized by plant community type because tower locations are unspecified at this time. However, estimates of the long-term disturbance area for each of the route alternatives is provided in Table 2-6 in Chapter 2. The combined impacts from tower footings, substation facilities, and the 12-foot centerline travel route would be substantially less than the temporary construction-related impacts. The plant communities that occur in the areas where long-term impacts would occur are abundant locally, in the project area and within the region. The communities that would be affected are small relative to their distribution. Thus, long-term impacts to upland plant communities would be less-than-significant. No mitigation would be required.

❑ ***Impact Vegetation-3: Long-term Loss of Altered Plant Communities***

Crested wheatgrass, cultivated, and developed and disturbed plant communities are altered plant communities with low potential for special-status plant occurrences. They generally have lower native species diversity than unaltered plant communities. Direct losses of crested wheatgrass, cultivated, and developed/disturbed plant communities would occur from installation of the tower footings, substation expansions, and use of the 12-foot wide centerline travel route for annual inspection and as-needed maintenance. Long-term impacts to altered plant communities would be less-than-significant because the amount of loss is small relative to their abundance in the region, and because they have a low percentage of native vegetation. No mitigation would be required.

❑ ***Impact Vegetation-4: Effects on Vegetation from Increased Access***

Creation of the 12-foot wide centerline travel route for annual ATV inspections and improvements to existing access roads could increase access and hence human or animal activities in the area following construction, which could in turn affect vegetation resources. As analyzed in Impact Vegetation-2 and -3, long-term losses of upland and altered communities that would be affected are small relative to the distribution of these communities within the project area and within the region. However, loss or degradation of upland and altered plant communities within the study corridor could result from the introduction of invasive weeds, or poor revegetation success. In areas with little to no invasive weed infestations (e.g., no cheatgrass), this loss or degradation could be extensive enough to be a significant impact. Implementation of Mitigation Measure Vegetation-1, the following mitigation measure, and Mitigation Measure Invasive Weeds-1 (in Section 3.5) would reduce the potential impact to a less-than-significant level.

❑ ***Mitigation Measure Vegetation-4***

- Existing barriers (i.e., fences and gates) would be maintained and new spur roads would be blocked or signage placed during construction to discourage unauthorized vehicular traffic.
- After construction, spur roads would be reclaimed, and where needed barriers created, to discourage new entry onto the ROW and disturbance of sensitive areas.

❑ ***Impact Vegetation-5: Impacts to Woodland Species With Commercial Value***

Construction and operation of the transmission line would result in temporary and long-term losses of pinyon and juniper trees. Juniper and pinyon trees would not be uniformly removed, however.

Long-term losses would occur from tree removal around towers and within 55 feet of the centerline, which is needed to maintain electrical clearance. Mid-way between the tower sites, trees over 15 feet in height may need to be cut if they fall within the clearance curve between two towers. On level terrain, shorter trees may not need to be cut near the support towers, because the conductor is higher than mid-span. Conversely, more trees would have to be removed or trimmed in the middle one-third of each span because the wire sags lower to the ground. Pinyon and juniper trees small enough not to affect transmission line operation (as determined by the growth envelope, the terrain, and the clearance curve between towers) would be left in place. In rough terrain, only trees on higher points may need to be removed. Tree trimming would be conducted to allow for a 10-year growth envelope. A percentage of the existing estimated 100 to 200 pinyon and juniper trees per acre would therefore remain.

Pinyon and juniper woodland is widespread and increasing within the region (BLM 1999b) in areas where fire suppression has occurred, but is severely diminished in areas burned by wildfires in recent decades (BLM 1999a). Increases or decreases in pinyon-juniper woodland can provide

a mixture of benefits and detrimental effects, depending on the resource. For instance, increases can be beneficial biologically (e.g., raptor habitat) and culturally (e.g., seed collecting and non-commercial harvesting).

Decreases can also be beneficial biologically where pinyon-juniper woodland has encroached on sagebrush habitat. The BLM RMPs for these areas allow for flexibility in managing this resource to meet different objectives (e.g., maintaining the woodlands for sustained yield, non-commercial harvesting and cultural resource purposes, and for wildlife habitat, and fire protection). The Burned Area Emergency Rehabilitation Plan (BLM 1999a) calls for restoring high productivity and severely burned woodland areas as part of the post-fire management strategy.

The proposed clearing of pinyon and juniper trees would result in an impact that is considered less-than-significant biologically in areas that have experienced fire suppression and are undergoing encroachment by pinyon-juniper woodland. However, in areas where wildfires have severely diminished the extent of woodland, additional clearing may be considered significant. There may also be impacts from the temporary or long-term loss of firewood and pinyon seeds.

Estimates of quantities of trees that must be removed can only be determined after the line design is complete and tower locations are staked in the field. However, for the purposes of this analysis, the relative differences in temporary and long-term tree removal would be proportional to the extent of pinyon-juniper woodland occurring within each segment. Implementation of Mitigation Measures Vegetation-5 would reduce impacts to less-than-significant levels.

❑ ***Mitigation Measure Vegetation-5***

The following would be implemented to restore pinyon and juniper trees and compensate for temporary and long-term tree losses:

- SPPC would pay for all woodland products lost due to construction and maintenance. Trees that are heavily damaged or removed would be tallied by species and height prior to or during these activities. The data would be provided to the BLM forester for determination of compensation. SPPC or its tree removal contractor would retain the woodland products paid for.
- Following construction, pinyon and juniper trees would be seeded into those construction disturbance areas that are not needed for future access, operation, and maintenance at a rate to be developed in coordination with BLM. The objective would be to restore woodland species to pre-construction tree densities while enabling access for annual inspections and as-needed maintenance.

Wetlands and Riparian Communities

❑ ***Impact Vegetation-6: Possible Removal or Disturbance of Riparian and Wetland Communities***

Riparian and wetland communities that provide important habitat for local and migratory wildlife and fish are considered sensitive resources and are of concern to federal and state agencies. While SPPC would avoid or minimize impacts to riparian and wetland communities, the project construction could result in the temporary removal or disturbance of riparian or wetland vegetation in some areas. This could occur from driving through drainages that support riparian vegetation and have no bridge, crossing, or unvegetated area nearby.

The majority of the route segments are not aligned with well-developed riparian communities, and most of the riparian communities in the study area have been disturbed and the habitat is

degraded from grazing by livestock, the driving of vehicles through streams, or dredging activities associated with improving the flow of a watercourse.

Wetland areas have not been delineated as part of this Draft EIS. A wetland delineation would need to be conducted in accordance with the USACE Wetland Delineation Manual (USACE 1987) once a route has been selected. Temporary and permanent impacts to wetland areas may be quantified at that time. In addition, permits would need to be obtained from the USACE for all discharges of fill material into waters of the U.S., including wetlands, before proceeding.

The transmission line would generally be constructed to span riparian areas and wetlands in the ROW. However, it is possible that some riparian areas or wetlands may not be entirely avoidable. The temporary or long-term loss of riparian and wetland communities would be a significant impact. Implementation of the following mitigation measure would reduce it to a less-than-significant level. Additional measures may also be required as part of the USACE permits obtained for the project.

❑ ***Mitigation Measure Vegetation-6a***

Before construction, qualified resource specialists would stake and flag or fence exclusion zones around all riparian and wetland areas that are avoidable. Exclusion zones would have a 20-foot buffer (approximately) beyond the limits of riparian or wetland vegetation. Depending on site-specific conditions, this buffer may be narrower or wider than 20 feet, as determined by the field resource specialist. Construction-related activities would be restricted within these zones.

Protective fencing would remain in place until all construction activities in the area are complete. Essential vehicle operation on existing roads, bridges, and crossings, as well as foot travel would be permitted. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities would be prohibited within the exclusion zone.

In areas where riparian or wetland habitats are unavoidable, the width of the centerline travel route would be narrowed to 20 feet. New spur roads and existing access road improvements would be constructed using BMPs that preserve existing hydrology and minimize disturbances to riparian and wetland habitats. Tower assembly and erection work areas would be minimized where possible. Where riparian vegetation must be removed, photographs and documentation of existing site conditions would be taken during the pre-construction survey. If woody native vegetation is involved, to facilitate regrowth following construction, plants would generally be cut at a height that minimizes damage to the root crown.

To minimize soil compaction and damage to vegetation in seasonal wetlands, construction activities would generally be limited to dry or frozen conditions. In unfrozen areas with perennially moist or saturated soils or in ponded areas, implement Mitigation Measure Soil-1(b) to minimize damage to the substrate and vegetation.

The BLM Compliance Inspector and SPPC's Environmental Compliance Monitor(s) would be responsible for ensuring that transmission line installation activities follow these riparian and wetland mitigation measures. In addition, SPPC would conduct a brief biological resource education program for construction crews covering, in part, the mitigation measures to follow to protect riparian areas, wetlands, and other sensitive resources. This program is discussed further in Mitigation Measure Special-Status Species-11 in Section 3.7.

❑ ***Mitigation Measure Vegetation-6b***

All riparian and wetland areas disturbed during project construction would be restored to ensure a no-net-loss of habitat functions and values. Actions would be implemented during

construction to help re-establish the conditions conducive to natural site regeneration to pre-construction conditions. Consistent with USACE Nationwide Permit No. 12 for utility line discharges, in wetlands that are excavated, the top 12 inches of topsoil from the excavated site would be stockpiled with intact roots, rhizomes, and seed bank.

The topsoil and subsoil would be replaced immediately after construction activities are complete. Following construction, a qualified soil or wetland scientist and restoration ecologist would identify areas that require recontouring of the ground surface to restore pre-construction hydrology and facilitate revegetation.

❑ ***Mitigation Measure Vegetation-6c***

Unavoidable losses of riparian and wetland communities would be mitigated by restoration and/or preservation of riparian and wetland habitats. The restoration and/or preservation would take place elsewhere within the 500-foot project study corridor or offsite, if no suitable habitat is available, at a ratio of 1:1. Habitat to be restored would include similar habitat to that which would be lost due to project activities. The restored site would already be degraded (e.g., by past land management practices), but would be available for restoration and protection from future disturbances. The final acreage for compensation would be determined by quantifying the post-construction disturbance area and condition and comparing it to the pre-construction size and baseline condition.

❑ ***Impact Vegetation-7: Possible Short-Term Disturbance of Other Waters of the United States***

Equipment access through non-sensitive drainages could result in disturbances to these features, many of which would qualify as "other waters of the U.S." subject to USACE jurisdiction under Section 404 of the Clean Water Act. Nearly all other waters of the U.S. in the project area are ephemeral drainages that become dry in the summer or are wet only briefly, during rain or snow events. They do not support woody riparian vegetation, sensitive species or critical habitat. Table 3.3-2 in Section 3.3, Water Resources, shows estimates of the number of watercourses that could be affected by project activities. However, many of these may not meet the legal definition of "waters of the U.S."

Any effects that do occur are expected to be minimal because the disturbances would be relatively brief and would not substantially alter wetland hydrologic functions, native soils, and plant material. This impact would therefore be considered adverse but less-than-significant. Implementation of Mitigation Measure Vegetation-6 (a-c), and the following mitigation measure would further reduce adverse impacts on other waters of the U.S. Additional compensatory, restoration, or avoidance mitigation measures may be identified by regulatory agencies (e.g., USACE, USFWS) as part of the permitting process.

❑ ***Mitigation Measure Vegetation-7***

Consistent with the USACE's Nationwide Permit No. 12 for utility line discharges, the area of waters of the U.S. to be disturbed would be limited to the minimum area necessary to successfully install the transmission line. The following actions would be implemented to minimize effects on and restore other waters of the U.S. and associated plant communities, if any:

- Stabilize exposed slopes and streambanks immediately on completion of installation activities. Other waters of the U.S. would be restored in a manner that encourages vegetation to reestablish to its pre-construction condition and reduces the effects of erosion on the drainage system.
- In highly erodible stream systems, stabilize banks using a nonvegetative material that would bind the soil initially and break down within a few years. If more aggressive erosion control

treatments are needed in some areas, geotextile mats, excelsior blankets, or other soil stabilization products could be used.

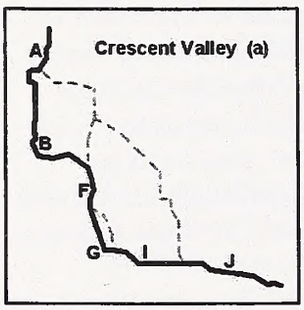
- During construction, remove trees, shrubs, debris, or soils that are inadvertently deposited below the ordinary high-water mark of drainages to minimize disturbance of the drainage bed and bank.
- New spur roads and improvements to existing access roads would be designed and implemented using BMPs that preserve existing hydrology and avoid permanent disturbances to other waters of the U.S.
- Implement additional measures required by the USACE permits.

These actions and all permit conditions would be incorporated into the COM Plan by reference and implemented by SPPC's construction contractor. BLM's Compliance Inspector and SPPC's Environmental Compliance Monitor(s) would routinely inspect construction activities to verify that these measures and permit conditions have been implemented.

Alternative-Specific Impacts

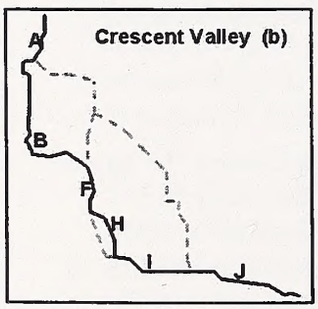
In addition to the impacts common to all route alternatives, the following presents impacts associated with specific route alternatives. Because the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

Crescent Valley (a) Route Alternative



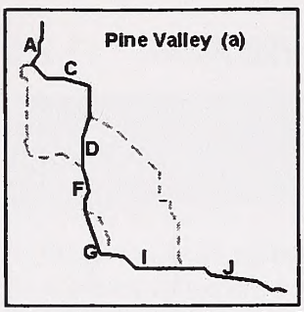
The Crescent Valley (a) route alternative is comprised of Segments A, B, F, G, I, and J. In addition to the impacts common to all route alternatives discussed above (i.e., Impact Vegetation-1 through –7), specific impacts for the Crescent Valley (a) route alternative are described below. According to Table 3.4-2, this route alternative would result in the temporary disturbance of approximately 584 acres of upland plant communities (Sagebrush, Shrub, Winterfat, Greasewood, Crested Wheatgrass), 79.8 acres of Pinyon-Juniper woodland, and 2.8 acres of riparian habitat. Out of all route alternatives, Crescent Valley (a) would temporarily disturb the greatest amount of upland plant communities, the 3rd greatest amount of Pinyon-Juniper woodland, and would temporarily disturb almost 2 more acres of riparian habitat than the Buck Mountain route alternative.

Crescent Valley (b) Route Alternative



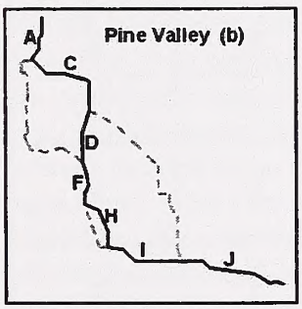
The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segment H instead of Segment G. According to Table 3.4-2, this route alternative would result in the temporary disturbance of approximately 580 acres of upland plant communities (Sagebrush, Shrub, Winterfat, Greasewood, Crested Wheatgrass), 85.1 acres of Pinyon-Juniper woodland, and 2.8 acres of riparian habitat. Out of all route alternatives, Crescent Valley (b) would temporarily disturb the 2nd greatest amount of upland plant communities, the 2nd greatest amount of Pinyon-Juniper woodland, and would temporarily disturb almost 2 more acres of riparian habitat than the Buck Mountain route alternative.

Pine Valley (a) Route Alternative



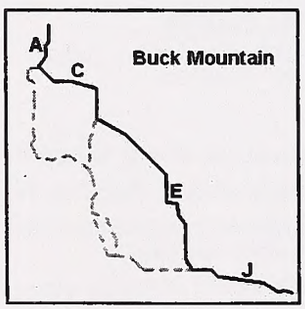
The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B. According to Table 3.4-2, this route alternative would result in the temporary disturbance of approximately 565 acres of upland plant communities (Sagebrush, Shrub, Winterfat, Greasewood, Crested Wheatgrass), 73.4 acres of Pinyon-Juniper woodland, and 2.8 acres of riparian habitat. Out of all of the route alternatives, Pine Valley (a) would temporarily disturb the 3rd greatest amount of upland plant communities, the least amount of Pinyon-Juniper woodland, and would temporarily disturb almost 2 more acres of riparian habitat than the Buck Mountain route alternative.

Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west. According to Table 3.4-2, this route alternative would result in the temporary disturbance of approximately 563 acres of upland plant communities (Sagebrush, Shrub, Winterfat, Greasewood, Crested Wheatgrass), 78.8 acres of Pinyon-Juniper woodland, and 2.8 acres of riparian habitat. Out of all of the route alternatives, Pine Valley (b) would temporarily disturb the 2nd least amount of upland plant communities, the 2nd least amount of Pinyon-Juniper woodland, and would temporarily disturb almost 2 more acres of riparian habitat than the Buck Mountain route alternative.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. According to Table 3.4-2, this route alternative would result in the temporary disturbance of approximately 510 acres of upland plant communities (Sagebrush, Shrub, Winterfat, Greasewood, Crested Wheatgrass), 92 acres of Pinyon-Juniper woodland, and .9 acre of riparian habitat. Out of all of the route alternatives, Buck Mountain would temporarily disturb the least amount of upland plant communities, the greatest amount of Pinyon-Juniper woodland, and would temporarily disturb the least amount of riparian habitat.

Summary Comparison of Route Alternatives

TABLE 3.4-3: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Vegetation-1: Temporary Disturbance and/or Loss of Upland and Altered Plant Communities from Construction	X	X	X	X	X
Impact Vegetation-2: Long-term Loss of Upland Plant Communities	X	X	X	X	X
Impact Vegetation-3: Long-term Loss of Altered Plant Communities	X	X	X	X	X
Impact Vegetation-4: Effects on Vegetation from Increased Access	X	X	X	X	X
Impact Vegetation-5: Impacts to Woodland Species With Commercial Value	X	X	X	X	X
Impact Vegetation-6: Possible Removal or Disturbance of Riparian and Wetland Communities	X	X	X	X	X
Impact Vegetation-7: Possible Short-Term Disturbance of Other Waters of the United States	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation and reclamation, residual impacts related to vegetation resources would be minor. Residual effects to vegetation resources would result primarily from a temporary loss of plant communities and a potential elevated level of cheatgrass cover in some project disturbance areas. After reclamation, these impacts should minimal.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to existing plant communities, wetlands, and riparian communities associated with the project would not occur. However, similar impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

3.5 INVASIVE, NONNATIVE SPECIES

3.5.1 AREA OF ANALYSIS AND METHODOLOGY

The study area for invasive, nonnative species (invasive weeds) consists of a minimum 500-foot wide study corridor along the route alternative segments (a minimum 250 feet on each side of the centerline), which together total about 341 miles. The study corridor includes mostly public lands administered by the BLM as well as some privately owned land. This section describes the laws and regulations applicable to invasive weeds within the project area, describes the methods used to obtain information, presents the occurrence of invasive weeds in the study corridor, and describes potential impacts of the project along with mitigation measures to reduce these effects.

DEFINITION OF INVASIVE, NONNATIVE SPECIES

For the purpose of this EIS, invasive, nonnative species are introduced plants and animals that are mandated to be prevented or controlled because of their potential to cause economic harm (e.g., affect the quality of forage on rangelands, affect cropland or forest land productivity) or environmental harm (e.g., displace native plants and natural habitats) or harm to human and animal health. Prevention, control, or eradication of these species may be legally mandated by state, federal, or other laws and regulations. There are no invasive, nonnative animals that are mandated for control in the project area. Therefore, this analysis focuses on invasive weeds. Invasive weeds are typically weeds that can still be effectively controlled or eradicated. They are generally not weeds that have become too extensive and widely distributed to effectively control or eradicate. Invasive weeds are species in the following categories:

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

Noxious weeds are invasive, nonnative species that are listed on state or federal noxious weed lists. They are generally weeds that cause harm to production of agriculture, range, forestry, or other commodities. Invasive nonnative species include but are not limited to noxious weeds.

REGULATORY FRAMEWORK

Executive Order 11312: Prevention and Control of Invasive Species

Executive Order 11312 (February 3, 1999) directs all federal agencies to prevent and control introductions of invasive nonnative species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. Executive Order 11312 established a national Invasive Species Council made up of federal agencies and departments and a supporting Invasive Species Advisory Committee composed of state, local, and private entities. The Invasive Species Council and Advisory Committee oversees and facilitates implementation of the Executive Order, including preparation of a National Invasive Species Management Plan.

Federal Noxious and Invasive Weed Laws

A number of federal laws pertain to noxious and invasive weeds, including the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 as amended (16 U.S.C. 4701 et seq.), Lacey Act as amended (18 U.S.C. 42), Federal Plant Pest Act (7 U.S.C. 150aa 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.), the Carlson-Fogey Act of 1968 (Public Law 90-583), and Federal Executive Order 11312 released February 3, 1999. The BLM and other federal, state, and local agencies are also concerned about weed infestation and dispersal on private and public lands. The BLM and U.S. Department of Agriculture maintain lists of pest plants of economic or ecological concern.

Nevada Noxious Weed Laws

Chapter 555 of the Nevada Revised Statutes pertains to noxious weeds. The Nevada Department of Agriculture (NDOA) has responsibility for jurisdiction, management, and enforcement of the state's noxious weed law. Plants on Nevada's noxious weeds list are to be controlled on private and public land. The law calls for the establishment of county "weed control districts" with the responsibility to control and eradicate noxious weeds. The Nevada Cooperative Extension maintains lists of state-listed noxious and invasive weeds of economic or ecological concern (www.extension.unr.edu).

METHODOLOGY

Information on invasive weeds known or with the potential to occur in the vicinity of the route alternatives was obtained from the BLM Elko and Battle Mountain Field Offices and the Nevada Cooperative Extension. Weed inventory maps were collected from the Elko Field Office, and lists of weeds to be included in the invasive weed survey for this project were obtained from the Battle Mountain Field Office and Nevada Cooperative Extension, as listed in Table 3.5-1. The Ely and Battle Mountain Field Offices did not have weed inventory maps that would be applicable for this project. Not all species identified in Table 3.5-1 have the potential to occur in the project area (Wilson 2000). One important invasive weed, cheatgrass (*Bromus tectorum*), was not included in the source lists for the survey and was not surveyed. However, cheatgrass is an extensive, very widely distributed, weed that is of great concern to BLM and other resource agencies.

Additional data on noxious weed species' habitat requirements, blooming periods, and field identifying characteristics were obtained from information provided by the Nevada Cooperative Extension, Integrated Pest Management Office, and other references, including *Invasive Plants in Nevada: An Identification Handbook* (Stoddard et al. 1992), *Weeds of the West* (Whitson 1992), *Weed Identification and Control Guide* (Donaldson and Bowers 1998), *Noxious Weeds of Central Nevada* (BLM 1999), *The Grower's Weed Identification Handbook* (University of California Undated), and *The Jepson Manual* (Hickman 1993).

Invasive weed surveys were conducted between May 24 and July 15, 1999, and April 26 and 27, 2000, by Summit Envirosolutions, Inc. (SEI) and Tetra Tech EMI. The invasive weed surveys were conducted concurrently with the vegetation baseline surveys described in Section 3.4, Vegetation Resources of this Draft EIS. Surveys were conducted on foot and/or by vehicle within the 500-foot-wide study corridor and along many adjacent roadways and drainages. Weed occurrences observed within these survey areas were identified and are included as Appendix 8 of the Vegetation Survey Report (SEI and Tetra Tech EMI 2000). Surveys were not conducted along most access roads that might be improved outside of the 500-foot wide study corridor, since they were not known at the time of surveys. Surveys and mapping for invasive weeds and sensitive resources along access roads would be conducted prior to construction, once a preferred alternative is selected.

TABLE 3.5-1: NOXIOUS AND INVASIVE WEEDS INCLUDED IN THE SURVEY

Common Name Scientific Name	Noxious/ Invasive	Plant Type	Habitat	Dispersal
African Rue *Peganum harmala*	N	Shrub	Desert scrub, waste places	Seeds, planting
Camelthorn * *Alhagi pseudalhagi*	N	Shrub	Arid waste places, washes, arid agricultural areas	Seeds
Common Crupina * *Crupina vulgaris*	I	Annual herb	Range and disturbed non-crop lands	Seeds
Dyer's Woad * *Isatis tinctoria*	N/I	Annual to short-lived perennial herb	Rangelands, cultivated fields and orchards, pastures, waste places, roadsides, fencerows.	Seeds
Eurasian Water-milfoil * *Myriophyllum spicatum*	I	Aquatic submergent	Lakes, ponds, canals	Stem fragments, runners
Goatsrue *Galega officinalis*	N	Perennial subshrub	Nutrient rich loam and clay soils in moist meadows	Seeds
Hemlock, Poison * *Conium maculatum*	N	Biennial herb	Moist disturbed places, streamsides	Seeds
Hemlock, Western Water * *Cicuta douglasii*	N	Perennial herb	Streams, irrigation canals, pastures	Seeds, rhizomes
Hoary Cress or Short Whitetop * *Cardaria draba*	N/I	Perennial herb	Disturbed alkaline sites	Seeds and root fragments
Horsenettle, White * *Solanum elaeagnifolium*	N	Perennial herb	Dry, disturbed sites, fields	Seeds, rhizomes
Houndstongue *Cynoglossum officinale*	I	Biennial herb	Disturbed sites	Seeds
Klamath Weed/St. Johnswort *Hypericum perforatum*	N/I	Perennial herb	Dry, sandy or gravelly soils in pastures, open woods, waste places, and roadsides	Seeds, creeping stems (stolons)
Knapweed, Diffuse * *Centaurea diffusa*	N/I	Annual to short-lived perennial herb	Roadsides, waste places, pastures, disturbed sites; can dominate rangelands with less than 8 inches annual precipitation	Seeds
Knapweed, Russian * *Centaurea repens*	N/I	Perennial herb	Roadsides, pastures, orchards; can dominate cultivated fields and rangelands where the water table is within 20 feet of the soil surface	Seeds, adventitious roots
Knapweed, Spotted * *Centaurea maculosa*	N/I	Biennial to short-lived perennial herb	Disturbed sites; can dominate rangelands with less than 8 inches annual precipitation	Seeds
Knapweed, Squarrose * *Centaurea virgata* spp. *squarrosa*	I	Perennial herb	Rangelands	Seeds
Leafy Spurge * *Euphorbia esula*	N/I	Perennial herb	Rangelands	Seeds, deep vigorous roots, root buds, root fragments
Licorice, Wild *Glycyrrhiza* sp.	N	Perennial herb	Moist open disturbed sites, creekbanks, roadsides	Seeds, roots
Mediterranean Sage *Salvia aethiopis*	N	Perennial herb	Fields, roadsides, rangeland	Seeds
Medusahead * *Taeniatherum caput-medusae*	I	Annual grass	Semi-arid rangeland	Seeds
Perennial Pepperweed /Tall Whitetop * *Lepidium latifolium*	N/I	Perennial herb	Waste sites, wet areas, ditches, roadsides, cropland	Seeds, spreading roots
Puncture Vine * *Tribulus terrestris*	N	Annual herb	Croplands, roadsides, pastures, urban areas	Spiked seeds and burs
Purple Loosestrife *Lythrum salicaria*	I	Perennial herb	Aquatic sites, streambanks, shorelines of ponds, reservoirs, canals and ditches	Seeds, rhizomes, ornamental planting

TABLE 3.5-1: NOXIOUS AND INVASIVE WEEDS INCLUDED IN THE SURVEY (CONT.)

Common Name Scientific Name	Noxious/ Invasive	Plant Type	Habitat	Dispersal
Rush Skeletonweed * *Chondrilla juncea*	I	Perennial herb	Well-drained, light textured soils in disturbed soils, roadsides, rangelands, grain fields, and pastures	Seeds
Saltcedar/Tamarisk * *Tamarix ramosissima*	I	Shrub	Alkaline soils, streamsides, washes	Seeds, roots
Sorghum/Johnson Grass *Sorghum halepense*	N	Perennial grass	Disturbed areas, ditchbanks, roadsides	Seeds, rhizomes
Star thistle, Yellow *Centaurea solstitialis*	N/I	Annual herb	Cultivated fields, pastures, grassland, rangeland, and waste sites	Seeds
Sulfur Cinquefoil *Potentilla recta*	I	Perennial herb	Disturbed areas, roadsides, moist rangeland	Seeds, roots
Thistle, Canada * *Cirsium arvense*	N	Creeping perennial herb	Disturbed sites; deep, loose, cool soils	Seeds, root buds, creeping rootstock
Thistle, Iberian Star *Centaurea iberica*	N	Perennial herb	Disturbed places, pastures	Seeds
Thistle, Musk * *Carduus nutans*	N/I	Biennial or annual herb	Roadsides, wetter rangeland, cultivated pastures, forest lands, grain fields, ditchbanks, waste sites, and stream banks	Seeds, root fragments
Thistle, Perennial Sow *Sonchus arvensis*	N/I	Perennial herb	Moist sites	Seeds, rhizomes
Thistle, Scotch * *Onopordum acanthium*	N/I	Biennial to short-lived perennial	Roadsides, fencerows, ditchbanks, waste areas, and pastures	Seeds
Toadflax, Dalmation *Linaria dalmatica*	N/I	Perennial herb	Roadsides, rangeland	Seed, roots
Toadflax, Yellow *Linaria vulgaris*	N/I	Perennial herb	Rangeland, roadsides, waste places, cultivated fields	Seed, roots

** Known to have the potential to occur in the project study area.*
Note: Cheatgrass (Bromus tectorum) was not included in the survey. It will be surveyed and mapped prior to construction (see Mitigation Measure Invasive Weeds-1j).

Locations of weed infestations were mapped on 7.5-minute quadrangles and then transferred to a GIS database. Infestations were plotted on the maps if a minimum of 25 square feet was populated by a weed species. Densities of representative weed populations were calculated by sampling roadside populations in Segment A (Dunphy quadrangle) and a meadow population in Segment F (Garden Pass quadrangle). Population densities are included in the Vegetation Survey Report (SEI and Tetra Tech EMI 2000). Additionally, satellite populations of species were noted and plotted on quadrangle maps if they were adjacent to roadways or streams. Satellite populations (i.e., possible new colonies) were defined as very small infestation areas (less than 25 square feet) that had only a few individual plants and were found apart from dense or large weed populations. Satellite populations were not indicated as discrete populations, but rather were indicated as a continuous infestation zone, specifically around the town of Eureka.

3.5.2 AFFECTED ENVIRONMENT

This discussion of affected environment is based on the invasive weeds baseline surveys performed by SEI. Numerous weed infestations occur throughout the project area, primarily along roadways, in cultivated areas and other disturbed areas. A table of the specific weed occurrences, organized by 7.5-minute quad maps, is included in the Vegetation Survey Report (SEI and Tetra Tech EMI 2000).

The primary type of invasive weed identified during surveys was hoary cress (*Cardaria draba*), also known as low whitetop. Hoary cress occurs primarily along roads, cultivated areas, and other disturbed areas in the region (i.e., predominantly pasturelands). A few infestations occur in wet meadows away from roadways. Representative photos of the hoary cress populations are provided in Figures 3.5-1 to 3.5-3.

Preliminary measurements indicate that densities of established roadside hoary cress infestation range from about 1 to 10 plants per square meter, with an average of roughly 6 plants per square meter. Meadow, cultivated area, drainage, and riparian area populations were found generally to be much higher in density than roadside populations. The sampled meadow population was found to be approximately 70 plants per square meter. Average weed densities of hoary cress populations found in the study corridor are provided in the Vegetation Survey Report (SEI and Tetra Tech EMI 2000).
One other invasive weed population was identified within the 500-foot wide study corridor. Perrenial pepperweed (*Lepidium latifolium*), also known as tall whitetop, occurs near the Rose Canal (in the Dunphy quadrangle).

Other invasive weeds observed in the area, although outside the study corridor, include Russian knapweed (*Centaurea repens*) and Canada thistle (*Cirsium arvense*), which were located in a few pasturelands and other areas of disturbance (i.e., a water discharge ditch from the Geysers power plant in Whirlwind Valley). A single specimen of poison hemlock (*Conium maculatum*) and a single tamarisk (*Tamarix* sp.) shrub were noted outside the study corridor. Hoary cress also occurred with high frequency outside the study corridor.

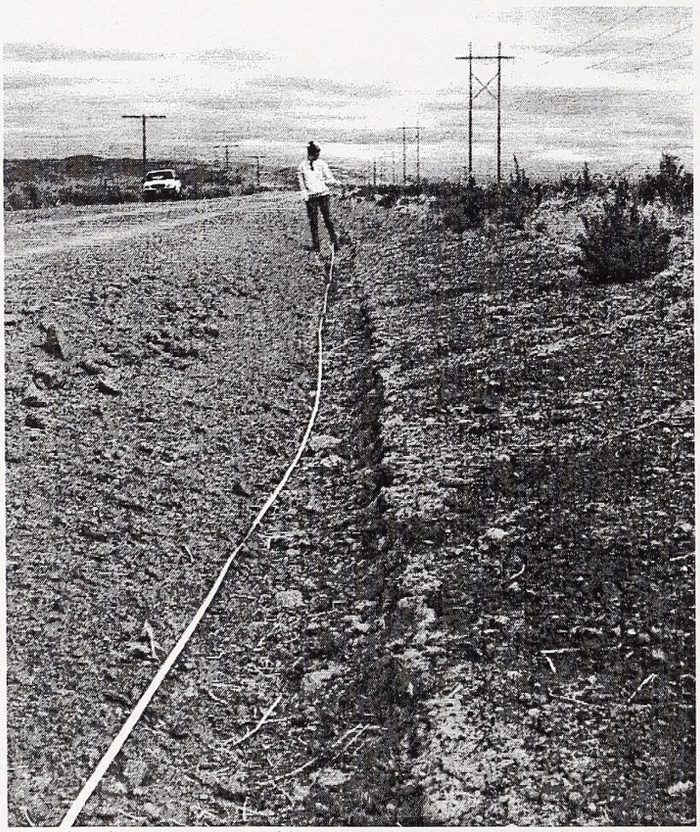
Cheatgrass was not surveyed for, but is extensive and widely distributed throughout the project area. It is expected to be extensive in portions of the project corridor, such as in the northwest portions of the project area.

FIGURE 3.5-1: HOARY CRESS (*Cardaria draba*)

FIGURE 3.5-2: HIGH DENSITY MEADOW POPULATION OF HOARY CRESS (*Cardaria draba*)

Photograph taken on private land outside the study corridor.

FIGURE 3.5-3: TYPICAL ROADSIDE POPULATION OF HOARY CRESS (*Cardaria draba*)



Only basal rosettes are noticeable in this early season photograph.
Photograph taken on road north of Dunphy on April 18, 2000.

3.5.3 ENVIRONMENTAL CONSEQUENCES

This section discusses the potential impacts of the project related to invasive weeds. Criteria for assessing invasive weed impacts are provided below.

SIGNIFICANCE CRITERIA

Impacts related to invasive weeds would be considered significant if project construction, operation, or maintenance would result in:

- Introduction or spread of invasive weeds into previously uninfested areas.
- Substantial spread of invasive weed infestations beyond an existing infestation zone. An infestation zone is defined as an area containing a single large infestation or several separate infestations after which none occur for several miles.
- Substantial increase in invasive weed population size or extent within an existing infestation zone.
- Substantial direct or indirect adverse effects on listed or non-listed special-status plant or wildlife species or sensitive communities.
- Substantial loss of a plant community, fish habitat, or wildlife habitat.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

The abatement of invasive weed infestations is legally mandated by state and federal laws and regulations. Invasive weeds produce adverse effects when they displace native plants, degrade wildlife habitat, affect the quality of forage on rangelands, affect cropland and forest land productivity, or cause harm to human health. Project construction, operation, and maintenance could result in impacts related to invasive weeds. These impacts are interrelated to effects on other resources, such as vegetation resources, wildlife and wildlife habitat, special-status plant and animal species, soils, and range resources. Weed propagules (seeds, stems, and root material) may be spread by vehicles and equipment from infested sites to previously uninfested sites. Weed propagules also may be transported via materials (e.g., weed-infested straw or soil).

Once weeds become established in new areas, they generally continue to spread where conditions are suitable. Disturbed areas such as burned areas, eroded slopes, river channels, and construction disturbance areas are generally more conducive to the spread of weeds, partly because competing vegetation is temporarily removed. Once invasive weeds are established, it is often difficult for native vegetation to reestablish on the site. The immediate effects of invasive weeds in previously degraded areas without sensitive resources may be small. However, because invasive weeds can grow and spread to areas with sensitive resources, the effects can be substantial and the infestations difficult to control.

CHEATGRASS

The frequency of wildfires in the Great Basin has increased substantially, largely as a result of the invasion by cheatgrass throughout the region. Once cheatgrass dominates an area, it is unlikely to be restored to the natural plant community due to the recurrence of wildfires. Wildfires are a natural component of the Great Basin ecosystem; however, increased wildfires can result in losses of wildlife and range habitat. Cheatgrass invasions are widespread and spreading by natural means thoughout the Great Basin. However, ground disturbance activities also contribute greatly to the spread of this ecosystem-altering invasive weed.

The following is an analysis of invasive weed impacts common to all route alternatives, followed by an analysis of impacts associated with the specific route alternatives and segments.

Impacts Common to all Route Alternatives

- ***Impact Invasive Weeds-1: Introduction and Dispersal of Invasive Weeds During Project Construction, Operations, and Maintenance***

  Construction, operation, and maintenance activities could introduce or spread invasive weeds into currently uninfested areas, which would be a significant impact. Introduction or spread of invasive weeds, including cheatgrass, could have direct or indirect long-term effects on vegetation resources, wildlife and wildlife habitat, special-status plant and animal species, soils, and range forage quality. Plants, seeds, or pests may be dispersed by construction equipment, vehicles, or in imported materials if the appropriate preventative measures are not taken. The spread of invasive weeds and pests is of concern to local, state, and federal agencies, including Weed Districts, Conservation Districts, the State of Nevada Department of Food and Agriculture, U.S. Department of Agriculture, BLM, and USFWS. All areas disturbed during construction would be revegetated following construction, as described in Chapter 2 and Appendix E, Reclamation Plan. Revegetation would reduce the potential for the spread of invasive weeds. In addition, impacts associated with invasive weed introductions and spread could be avoided and mitigated to a less-than-significant level by implementing Mitigation Measures Vegetation-1 and -4, described in Section 3.4, Vegetation, as well as the following measure. Due to their widespread distribution and extent, cheatgrass populations are addressed separately below under Mitigation Measure 1j.

- ***Mitigation Measure Invasive Weeds-1***

  Construction Period Avoidance of Invasive Weeds: To prevent the spread of invasive weeds into previously uninfested areas in the transmission line corridor and around the substations, SPPC would implement the following measures:

  (a) Qualified invasive weed specialists, range ecologists, or botanists would survey the 500-foot wide study corridor, substation sites, new spur road sites, existing access roads that require improvements, and material yards and staging areas prior to construction to identify and stake all previously identified and new invasive weed infestations and to clearly identify their locations on the construction drawings. The infestation area would be staked to include an appropriate buffer area where a seed bank may be present beyond the weeds. SPPC would be responsible for flagging these infestation areas. SPPC's environmental compliance officer would ensure that construction-related activities would be prohibited within these zones through field monitoring. All other construction activities, vehicle operation, material and equipment storage, and other surface-disturbing activities would be prohibited within the exclusion zones. SPPC would remove all stakes and flagging demarcating exclusion zones within 60 days after construction and site restoration have been completed in the area. Where avoidance is infeasible, please refer to measures d through i below. Due to extensive hoary cress infestations around Eureka, that area would be handled differently (as detailed in Mitigation Measure 1b).

  (b) All roads and ditches in the Eureka area would be considered infested, based on current conditions. Due to the substantial size and nearly continuous distribution of hoary cress infestations in the Eureka area, invasive weed infestation areas may not be feasible to stake and flag. The Eureka area would be considered a high-infestation zone, and project vehicles or equipment would be prohibited from stopping, parking, or travelling off roadways or onto dirt road shoulders, except during emergencies. The high-infestation area would be

delineated prior to project construction. All parking and staging in the Eureka area would be restricted to designated staging and parking areas that are both uninfested and also less vulnerable to infestation (e.g., paved areas, dry sites away from ditches), or sites which are being properly treated to control the spread of invasive weeds in accordance with the Weed Abatement Plan included in Appendix E, Section E.3, Implementation. These areas would be identified and staked by qualified invasive weed specialists, range ecologists, or botanists prior to construction and their locations would be clearly identified on the construction drawings. SPPC would be responsible for flagging these designated parking and staging areas, and for removing all stakes and flagging demarcating these areas, within 60 days after construction and site restoration have been completed in the area.

(c) SPPC would be responsible to educate construction supervisors, managers, general foremen, and foremen on weed identification and the importance, per legal mandate, of controlling and preventing the spread of invasive weed infestations, including discussion of mitigation measures required with this project. Due to the high turnover rate associated with construction crews, general foremen and foremen would be required to inform all construction personnel under their supervision of the importance, per legal mandate, of controlling and preventing the spread of invasive weed infestations, including discussion of mitigation measures required with this project.

Construction Period Control of Unavoidable Invasive Weeds: To prevent the spread of invasive weeds, including cheatgrass, from unavoidable infestation zones into previously uninfested areas, implement the following measures:

(d) Before beginning construction activities, employ acceptable mechanical, cultural, or herbicidal methods of invasive weed control and removal in all areas that will be disturbed during construction of the transmission line and substation (refer to Appendix E, Section E.3, Implementation–Weed Abatement Plan).

(e) If control or removal of invasive weed infestations in construction disturbance areas is not feasible prior to construction, the plants may be cut and disposed of (e.g., in a landfill) or destroyed in a manner acceptable to the Nevada Division of Agriculture Bureau of Plant Industry and Nevada Cooperative Extension. One or both of the following will be implemented to minimize the spread of seeds and plant materials by equipment and vehicles during construction: 1) topsoil will be excavated, stored on site, monitored, and treated during construction, if necessary, to prevent the buildup of new weeds and seedbank, and replaced, monitored, and treated following construction; and 2) layer(s) of mulch, degradable geotextiles, or similar materials will be placed over the infestation area and secured in a manner so they would not be washed away.

(f) SPPC's contractors would be required to clean equipment and vehicles at designated high pressure air or water wash stations located away from waterways prior to use in the project area and after leaving unavoidable infestation zones in the construction corridor and along access roads, including Eureka. An infestation zone is defined as an area containing a single large infestation or several separate infestations, after which none occur for several miles. Wash stations would be identified prior to construction by a qualified invasive weed specialist, range ecologist, or botanist. Wash stations would be selected to prevent infestations from moving into the uninfested landscape expanses outside of infestation zones. The wash down would concentrate on the undercarriage, axles, frame, cross members, on and under steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs would be swept and refuse disposed of in waste receptacles.

(g) Wash stations would be periodically monitored, invasive weeds would be treated, and where appropriate, native vegetation would be re-established following construction to prevent the spread of invasive weeds. Environmental compliance monitors and construction workers would routinely inspect transmission line and substation construction equipment to verify that equipment is being cleaned of soil and plant matter at designated wash stations.

(h) Use certified invasive weed-free imported materials (e.g., straw bales, erosion control seed) when and where needed during construction, reclamation, maintenance, and operations.

(i) Conduct follow-up invasive weed surveys and weed control treatments (see Appendix E, Section E.3, Implementation - Weed Abatement Plan) during the growing season following completion of construction and revegetation activities in all construction and reclamation areas. The surveys may be conducted concurrently with reclamation monitoring activities. New hoary cress infestations, if any, would be visible in late winter to early spring and would be expected to spread to moist areas (e.g., moist meadows, roadside ditches) and waterways (e.g., ditch banks) in the project area. New cheatgrass infestations would be visible in spring through early summer and would be expected to spread to highly susceptible sites as described in Mitigation Measure Invasive Weeds-1j below. Perennial pepperweed infestations would be visible in late winter through summer and would be expected to spread to moist areas similar to hoary cress. Control would be considered successful when:

- The extent and density of the infestations in the construction disturbance areas, by species, are not greater than the baseline conditions measured just prior to project construction; and
- Revegetation criteria (see Appendix E, Reclamation Plan) are met.

(j) **Cheatgrass:** Due to the widespread distribution and extent of cheatgrass expected in portions of the study corridor, it may not be feasible to stake and flag all cheatgrass infestation areas. During pre-construction weed surveys, dense cheatgrass infestation areas and areas highly susceptible to cheatgrass would be identified. Highly susceptible areas would include largely uninfested sites located near dense cheatgrass infestations, especially those that were recently burned or are on soil types (e.g., Tenabo Series) that are frequently dominated by cheatgrass. To the extent feasible, staging and parking areas would be located outside the dense cheatgrass infestation zones. Where dense and extensive cheatgrass zones are unavoidable, wash stations would be located at the edge of the zone. Vehicles and equipment would be cleaned prior to entry to highly susceptible areas (see Mitigation Measure Invasive Weeds-1f).

Areas disturbed by project construction which are highly susceptible to cheatgrass invasion would be monitored and treated during the reclamation process. Areas currently dominated by cheatgrass may, in some cases, be revegetated with greenstrips to help prevent wildfire spread and to provide access for firefighting crews. Site-specific cheatgrass control and revegetation protocols shall be included in the COM plan for reclamation of highly susceptible areas and cheatgrass-dominated areas to be selected for greenstripping. The prescribed seed mixes for greenstrips and areas highly susceptible to cheatgrass invasion would include, where necessary, the use of competitive nonnative, noninvasive plants (e.g., crested wheatgrass) to compete with cheatgrass. Greenstrip locations would not be placed in all cheatgrass-infested areas. They would be chosen based on the likelihood of effectively suppressing fires and protecting resources from future wildfires and cheatgrass infestations. Areas proposed for greenstripping would be determined in cooperation with BLM, NDOW, and the Nevada Department of Forestry.

Operation and Maintenance Control: To prevent the introduction and spread of invasive weeds into previously uninfested areas during project operation and maintenance, SPPC would:

(k) Conduct follow-up invasive weed surveys in the 160-foot wide transmission line right-of-way, around substations, and along access roads used exclusively or primarily for project operations and maintenance following construction until revegetation and weed abatement criteria have been met (see Appendix E, Section E.4). Locate, map, monitor and treat invasive weeds introduced or spread by operation, maintenance, or other activities in these areas.

(l) Educate operations and maintenance supervisors and managers on weed identification and the importance of controlling and preventing the spread of invasive weed infestations.

(m) Regularly clean equipment and vehicles prior to and after use in the transmission line corridor and around substations, especially after leaving unavoidable infestation zones.

(n) Reseed substantial-sized (e.g., greater than 0.5 acre) areas disturbed during operations and maintenance activities that are at risk to weed invasion (see Appendix E, Reclamation Plan).

(o) Continue to coordinate with land management agencies to ensure that the appropriate BMPs are implemented to minimize weed introductions and dispersal. Participate in weed management programs and meetings in coordination with land management agencies and weed management groups in the region including the BLM and others, such as the Nevada Cooperative Extension, Nevada Division of Agriculture Bureau of Plant Industry, Weed Management Districts, and the Nevada Weed Management Association.

Alternative-Specific Impacts

In addition to the impacts common to all route alternatives described above, the following addresses impacts that would be associated with specific route alternatives. Because the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

Several hoary cress noxious weed infestations and one population of perennial pepperweed have been documented in the project area, primarily on Segments A, B, and I and to a lesser extent in Segments D and J. Additional populations of these and other invasive weed species are known or likely to occur within the region but outside the study corridor, especially in disturbed areas, such as along existing access roads and potential material yards/staging areas. Cheatgrass was not surveyed, but is known to be extensive and widely distributed throughout the region. It is expected to be extensive in north west portions of the project area. Pre-construction weed surveys would be required, including surveys for dense cheatgrass infestations and areas highly susceptible to cheatgrass (see Mitigation Measure Invasive Weeds-1j).

Invasive weed infestation acreages and locations determined by the survey are provided in Figure 3.5-4 and Tables 3.5-2 and 3.5-3. Precise locations of infestations are shown in the oversized maps accompanying the Vegetation Survey Report (SEI and Tetra Tech EMI 2000). These maps are available for public review at the Ely, Battle Mountain, and Elko BLM Field Offices. The extent of invasive weed infestation is summarized by segment in Table 3.5-2, and by route alternative in Table 3.5-3.

TABLE 3.5-2: NOXIOUS WEED INFESTATION BY SEGMENT

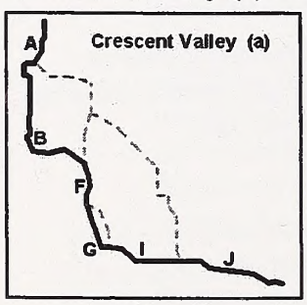
Noxious Weed Cover in 500-Foot Project Study Corridor (Acres/Percent of Segment/Number of Infestation Sites)										
Noxious Weed	A	B	C	D	E	F	G	H	I	J
Hoary Cress	--	3.34 0.1% 7 sites	--	0.23 0.02% 2 sites	--	--	--	--	14.63 0.8% 27 sites	0.24 0.01% 3 sites
Perennial Pepperweed / Hoary Cress / Cultivated	5.64 0.6 % 1 site	--	--	--	--	--	--	--	--	--
Total – All Weeds	**5.64 (0.6 %)**	**3.34 (0.1%)**	--	**0.23 (0.02%)**	--	--	--	--	**14.63 (0.8%)**	**0.24 (0.01%)**

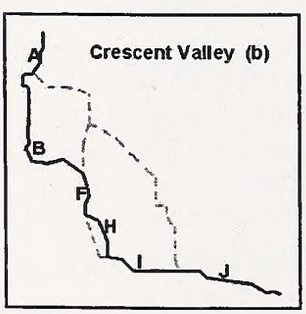
TALE 3.5-3: NOXIOUS WEED INFESTATION BY ROUTE ALTERNATIVE

Noxious Weed	Crescent Valley (a) and (b)[1]	Pine Valley (a) and (b) [1]	Buck Mountain
Hoary Cress	18.21 acres (37 sites)	15.1 acres (32 sites)	0.24 acres (3 sites)
Perennial Pepperweed / Hoary Cress / Cultivated	5.64 acres (1 site)	5.64 acres (1 site)	5.64 acres (1 site)
Total – All Weeds	23.85 acres (38 sites)	20.74 acres (33 sites)	5.88 acres (4 sites)

[1]*Note: there is no difference in weed infestations between the Crescent Valley (a) and (b) route alternatives, nor any difference between the Pine Valley (a) and (b) route alternatives; therefore, results are not presented separately.*

Crescent Valley (a) and (b) Route Alternatives





Crescent Valley (a) and (b) include Segments A, B, F, G/H, I, and J, as well as the K and L re-routes, which could be used to realign portions of Segment B around sensitive resources. Site-specific infestations and potential impacts are described below.

Segment A, shared by all of the route alternatives, contains the only observed occurrence of tall whitetop in the project area. The 5.6-acre tall whitetop infestation occurs with hoary cress, near the Rose Canal in the Dunphy quadrangle. All other weed populations found within the study area during surveys were hoary cress.

In the Crescent Valley route alternatives, hoary cress infestations were documented in Segments B, I, and J, primarily along roads, cultivated areas, and other disturbed areas, which are predominantly pasturelands. The majority of hoary cress infestations in the study corridor occurs in segments associated with the Crescent Valley route alternatives, namely Segments I and B. Smaller amounts also occur in Segment J (which is also shared by all routes).

The vast majority of the hoary cress roadside populations appear to be occasional, colonizing satellite populations, with the exception of infestations in and around the town of Eureka (Segment I), where nearly all roads and drainages have populations of hoary cress. The populations occur as stringers along the roadside berms and ditches. The hoary cress infestation appears to be spreading, likely the result of seed movement by road maintenance equipment and vehicles, stormwater runoff, and other means.

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Noxious Weed Infestation Areas

General Areas of Occurrence

- Weeds within 500 ft Corridor
- Weeds within 1000 ft Corridor

TRANSMISSION LINES

- Route Alternatives
- Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco

04/26/01

SOURCES: Summit Envirosolutions — field surveys, 1999-2000)

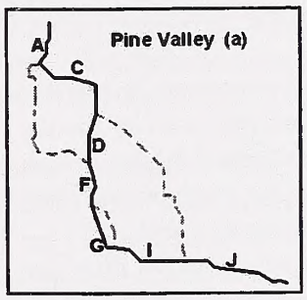
Figure 3.5 - 4

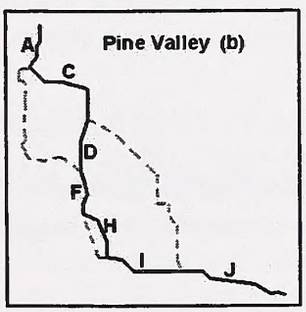
Currently uninfested roads and drainages in and around Eureka will likely become infested with hoary cress in the future. For the purposes of this EIS, all roads and drainages that parallel or bisect the proposed alignment in and around Eureka are considered to have satellite populations of hoary cress.

No invasive weed infestations were documented in Segments F, G, or H.

In total, 23.85 acres of invasive weeds (occurring at 38 sites) were documented along Crescent Valley, the highest of any route alternative. Impacts related to invasive weeds are discussed above, under impacts common to route alternatives. Mitigation Measure Invasive Weeds-1 would apply to infestations documented in the Crescent Valley route alternatives.

Pine Valley (a) and (b) Route Alternatives

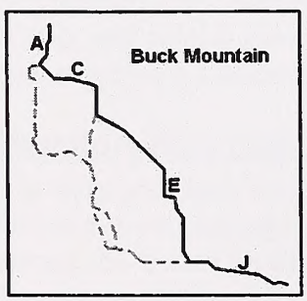




Pine Valley (a) and (b) include Segments A, C, D, F, G/H, I, and J. Thus, impacts discussed above for Segments A, I, and J apply to the Pine Valley route alternatives as well. In addition, two site locations of hoary cress infestation were documented in Segment D, which is unique to the Pine Valley route alternatives. However, these infestations total only 0.23 acre. No invasive weed infestations were documented in Segment C.

In total, 20.74 acres of invasive weeds (occurring at 33 sites) were documented along the Pine Valley route alternatives, the second highest of the route alternatives and a total quite similar to Crescent Valley (a) and (b). Impacts related to invasive weeds are discussed above, under impacts common to route alternatives. Mitigation Measure Invasive Weeds-1 would apply to infestations documented in the Pine Valley route alternatives.

Buck Mountain Route Alternative



Buck Mountain includes Segments A, C, E, and J. Thus, impacts discussed above for Segments A and J apply to the Buck Mountain route alternatives as well. No invasive weed infestations were documented in Segment E, which is unique to Buck Mountain.

In total, 5.88 acres of invasive weeds (occurring at 4 sites) were documented along the Buck Mountain route alternative, by far the lowest of the five route alternatives. Impacts related to invasive weeds are discussed above, under impacts common to route alternatives. Mitigation Measure Invasive Weeds-1 would apply to infestations documented in the Buck Mountain.

Infestations Outside the Project Area

Other invasive weeds occur in the project area, although outside the study corridor. These include a few infestations of Russian knapweed and Canada thistle in Whirlwind Valley, a single specimen of poison hemlock along Huntington Creek (in the Walker Canyon quadrangle), a single tamarisk shrub near a Cortez Canyon drainage (in the Cortez Canyon quadrangle), and several infestations of hoary cress adjacent to areas infested within the study corridor.

Summary Comparison of Route Alternatives

TABLE 3.5-4: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Invasive Weeds-1: Introduction and Dispersal of Invasive Weeds During Project Construction, Operations, and Maintenance	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation and reclamation, residual impacts related to invasive weeds would be minor. Invasive weed introductions occur both naturally (e.g., seeds dispersed by wind, water, or animals) and by human access (e.g., seeds carried on vehicles). After construction, spur roads would be reclaimed to discourage new access to the right-of-way. SPPC would access the transmission line corridor for yearly inspections and occasional repairs. However, the level of invasive weed introductions after mitigation and reclamation are expected to be minor and within the range of current rates of introductions, as there are numerous existing dirt access roads, as well as ongoing livestock grazing activities in the project area.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts related to invasive nonnative species associated with this project would not occur. However, impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

3.6 WILDLIFE AND WILDLIFE HABITAT

3.6.1 AREA OF ANALYSIS AND METHODOLOGY

This section addresses common wildlife and wildlife habitats in the study corridor and impacts that the transmission line would have on these resources. The area of analysis for common wildlife consisted of a 2-mile wide corridor extending from Segment A to J, including the K and L re-routes. For wildlife habitat, it consisted of a 500-foot wide study corridor (250-feet on each side of the centerline) extending from Segment A to J, including the K and L re-routes.

Data on the existing environment were collected by conducting field surveys in 1999 and 2000 on foot, in 4 x 4 vehicles, ATVs, and helicopters at various times of the day. Biologists walked meandering transects along portions of the study corridor, and binoculars were used to scan both sides of the centerline. The Nevada Division of Wildlife (NDOW) and U.S. Fish and Wildlife Service (USFWS) provided additional data. The findings were documented in the Vegetation Survey report by Summit Envirosolutions, Inc. and Tetra Tech EMI (2000) and the Wildlife Survey report by Summit Envirosolutions, Inc (2000).

In the summer of 1999, Nevada experienced one of the worst fire seasons since the 1940s; more than 1.5 million acres were burned. Wildfires struck again in 2000. The fires impacted wildlife habitats ranging from pinyon-juniper woodlands to salt desert shrub. Segments B, C, E, L, and J of the route alternatives traverse five main burn areas: Trail Canyon and Mule (Segment B), Frenchie (Segment C), Sadler (Segment E), and Crusoe (Segment J). These burn areas are mapped on Figure 3.4-1 in Section 3.4. The vegetation survey data were collected before the fires occurred in the summer of 1999 and in 2000.

REGULATORY FRAMEWORK

BLM Resource Management Plans (RMPs)

The BLM RMPs provide management standards for wildlife habitat and wildlife. BLM Field Offices monitor wildlife and habitat condition and maintain crucial wildlife habitat jointly with NDOW. BLM and NDOW jointly manage habitat for mule deer, pronghorn antelope, and other game species. BLM manages habitat condition for any wildlife species by assessing the ability of a land area to supply the forage, cover, water, and space requirements of wildlife. Trend studies determine the directional change of a habitat from or toward desired condition. These Habitat and Trend studies (BLM Manual 6630.2, 6630.3, and 6630.4) allow the BLM to adjust management prescriptions through grazing or other public uses to improve habitat for big game.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC 703) makes it unlawful to pursue, hunt, take, capture, kill, or possess any migratory bird, or part, nest, or 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 USSR. In addition, this act also contains a clause that prohibits baiting or poisoning of these bird species. The current list of species covered by MBTA can be found in Title 50, Code of Federal Regulations Sec. 10.13. Because several migratory bird species may occur within the study corridor, the MBTA applies to those bird species that may be affected during the implementation of the Falcon to Gonder project.

3.6.2 AFFECTED ENVIRONMENT

COMMON WILDLIFE

In this document, the term "common wildlife" refers to wildlife species that are relatively abundant and are not "special-status" species. Special-status species, such as those listed as threatened, endangered, or sensitive by government agencies, are covered in Section 3.7.

The 1999 and 2000 field surveys identified 90 species of birds, 29 species of mammals, seven species of reptiles, one species of amphibian, and three species of fish in the study corridor (SEI 2000). There are approximately 250 vertebrate wildlife species that occur in northeastern Nevada; the project would cross habitat for many of these species. Areas with greater habitat and structural diversity, such as water and rock outcrops, and multiple vegetation layers typically had significant numbers of wildlife species.

Sagebrush habitat provides food and cover for jackrabbits (*Lepus californicus*), cottontail rabbits (*Sylivagus* sp.), ground squirrels (*Spermophilus* sp.), wood rats (*Neotoma* sp.), pocket mice (*Perognathus* spp.), deer mice (*Peromyscus maniculatus*), grasshopper mice (*Onychomys* spp.), sagebrush vole (*Lemmiscus curtatus*), and kangaroo rats (*Dipodomys* spp.). Birds inhabiting sagebrush include the chukar (*Alectoris chuckar*), black-billed magpie (*Pica pica*), gray flycatcher (*Empidonax wrightii*), sage thrasher (*Oreoscoptes montanus*), several sparrows, and hawks. Small mammals and reptiles also rely on sagebrush vegetation as a source of water because morning dew collects on the leaves and flowers, making it available for small animals. It also provides cover in the form of shade during the hot, dry summers (Aspen 1995). Migratory mule deer (*Odocoileus hemionus*) use this habitat type as a major winter range, and it is a principal habitat for pronghorn (CDFFP 1988). Low sagebrush is somewhat more palatable to pronghorn (*Antilocapra americana*) than big sage and provides an important source of early spring forage for pronghorn and mule deer. Several raptor species use low sagebrush as hunting grounds. Sage grouse (*Centrocercus urophasianus*), burrowing owl (*Athene cunicularia*), and pronghorn breed in low sagebrush areas.

Pinyon-juniper woodlands, particularly when combined with crops and grazing lands, provide good foraging and/or nesting habitat for raptors, such as golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), and other raptor species (Aspen 1995). In addition, pinyon nuts and juniper berries are an important food source for birds such as pinyon jay (*Gymnorhinus cyanocephalus*), wintering birds and small mammals, and these in turn serve as dispersal agents for both plant species (CDFFP 1988). Some mammals, such as pronghorn, may consume juniper foliage, especially during harsh winters. Pinyon-juniper habitats may also be used by small mammals, deer, and antelope for foraging. Small and larger mammals (e.g., bushy-tailed woodrat [*Neotoma cinerea*]) build nests in this habitat type. Many species of reptiles, including western fence lizards (*Sceloporus occidentalis*) and gopher snakes (*Pituophis melanoleucus*), inhabit pinyon-juniper woodlands. Juniper and associated shrubs provide an important source of winter forage and winter cover for mule deer (FERC 1995).

Mammals

The desert woodrat (*Neotoma lepida*) and the bushy-tailed woodrat both occupy similar habitats. It was assumed that the middens encountered in the vicinity of Segments B, D, E, H, I, and J correspond to one of these two species of woodrat. However, the bushy-tailed more often nests in rocky outcrops and even nests high up in trees in coniferous forests. The desert woodrat is more likely to nest on the ground in the old burrow of a ground squirrel or kangaroo rat. Middens were most commonly located in rock outcrops in the vicinity of the study corridor. Not all middens were active, as determined by the lack of fresh-cut vegetation and fresh scat.

Five species of ground squirrels were recorded in the study corridor: Richardson's ground squirrel (*Spermophilus richardsonii*), golden-mantle ground squirrel (*S. lateralis*), Belding's ground squirrel (*S. beldingi*), Townsend's ground squirrel (*S. townsendii*), and antelope ground squirrel (*Ammospermophilus leucurus*). Only the Richardson's ground squirrel was abundant, forming colonies in agricultural fields and in areas heavily grazed by cattle. Three species of voles, including sagebrush vole (*Lagurus curtatus*), montane vole (*M. montanus*), and long-tailed vole (*M. longicaudus*), were conspicuous and frequently observed in sagebrush and riparian communities.

Evidence of muskrat (*Ondatra zibethica*) (e.g., tracks, scat, burrows) was abundant along Huntington Creek, Walker Canyon Quad (Segment E), and was also found on Segment H. This species is common

to abundant in riparian habitats, aspen, and lacustrine and riverine habitats. This species also occupies human-made habitats, such as roadside ditches (CDFG 1990). Old bleached scat from both black-tailed jackrabbit and Nuttall's cottontail rabbit (*Sylivagus nittallii*) and an upper jaw of the latter species were observed in the greasewood flats in the L re-route.

Coyotes (*Canis latrans*) were observed in all portions of the study corridor. Coyotes occur in almost all habitats and successional stages. They frequent open brush, shrub, and herbaceous habitats (CDFG 1990). Badgers (*Taxidea taxus*) were both visually observed and detected by their characteristic burrows. Badgers were recorded in most segments but were most numerous in Segments B and E. Badgers are most abundant in drier open stages of most shrub, forest, and herbaceous habitats (CDFG 1990).

The remains of a bobcat (*Felis rufus*) carcass were found in a water-filled ditch (Slough Creek) along Highway 50 in Segment I. Bobcats use nearly all habitats and successional stages. Its optimal habitats are brushy stages of low and mid-elevation conifer, riparian and pinyon-juniper forests, and all stages of chaparral (CDFG 1990).

According to NDOW resource staff, two common species of bats occur within the study corridor: big brown bat (*Eptesicus fuscus*) and the pallid bat (*Antrozous pallidus*) (personal communication with P. Bradley, biologist, April 11, 2000). The big brown bat has been recorded in virtually every North American vegetation type. The pallid bat is a common species of low elevations and inhabits a wide variety of habitats but is most common in open, dry habitats with rocky areas for roosting (CDFG 1990).

Big Game

Mule deer were observed throughout most of the study corridor. Figure 3.6-1 shows mule deer seasonal range distribution. Mule deer winter range exists from Railroad Pass to the lower slopes of the Diamond Mountains. The area where the Buck Mountain Route leaves Newark Valley and heads northwest toward the south end of Buck Mountain is identified as critical mule deer winter range for the state of Nevada's largest deer herd, the Ruby Mountain herd.

The study corridor crosses big game winter range in two areas: the Dry Hills – Cortez Range winter area (personal communication with K. Wilkinson, BLM Elko Field Office, July 19, 2000) and Diamond Mountains near Newark Pass (personal communication with M. Podborny, NDOW, July 24, 2000). After the route passes over the hydrologic divide between Newark and Huntington Valleys, it would traverse through mule deer spring, summer, and fall habitats. Antelope Summit and Robinson Summit along Segment J are considered critical congregation areas for mule deer in winters with heavy snow (Perkins 2001).

Pronghorn were recorded in Segments B, D, E, I, and J but were most numerous in Segments E and I. Pronghorn habitat is located in Crescent Valley and from the top of Cortez Canyon to the bottom of McClusky Creek. As many as 20 individuals were frequently observed from Cortez Mine to the town of Crescent Valley. Use in the north end of Grass Valley has been limited to a few scattered sightings in the spring (April-June). However, the Dry Hills may be a limited fawning area. The fawning season is mid-April through mid-June. Crucial winter and spring habitat exists from the bottom of the 3-Bar Ranch to Devil's Gate on Highway 50 (Segment I). Segment E of the Buck Mountain Route passes through pronghorn habitat where the route traverses north in Newark Valley, heads northwest toward the south end of Buck Mountain, and proceeds up Newark Valley. As the line nears the south end of Buck Mountain it passes over Barrel Spring, which is located on private land and is the primary water source for pronghorns in this portion of the valley.

Birds

Shorebirds & Waterfowl

In wet years, Slough Creek, which is parallel to Highway 50, floods and ponds (personal communication with M. Podborny, NDOW, August 9, 1999). In both 1998 and 1999, the creek formed large ponds on both sides of the highway. Waterfowl such as mallard (*Anas platyrhynchos*), northern shoveler (*Anas clypeata*), and Canada goose (*Branta canadensis*) are known to breed at these ponds. Because fish did not inhabit the ponds or creek, fish-eating birds such as herons would not be expected to breed at this site. However, numerous shorebirds, including avocets (*Recurvirostra americana*), Wilson's phalaropes (*Phalaropus tricolor*), and black-necked stilt (*Himantopus mexicanus*) were observed approximately 0.25 mile east of the centerline in Crescent Valley (East of the Tenabo Quad). The birds were foraging in the vicinity of Indian Creek and the study corridor. This area is flooded because of dewatering from the Cortez Mine.

Waterfowl and shorebirds are common where Segment A crosses the Humboldt River. In addition to great blue herons (*Ardea herodias*) and snowy egrets (*Egretta thula*), more than a dozen black-crowned night-herons (*Nycticorax nycticorax*) were recorded flying north along the Humboldt River and across I-80 (Dunphy Quad). Black-crowned night-herons nest in colonies, often in mixed colonies with other species of herons and water birds (Ryser 1985). According to NDOW (personal communication with M. Podborny, August 9, 1999), a large mixed colony of black-crowned night-herons and snowy egrets roosts in the dense willow forests southeast of Dunphy and the Horseshoe Ranch (off Highway 306). The study corridor is located approximately 3 miles northeast of the known roost. Sandhill cranes (*Grus canadensis*) are known to nest in the north end of Newark Valley. They nest in grassy marshes and wet meadows with patches of willows. This species was not observed during the field surveys, and the study corridor does not cross suitable nesting habitat.

Raptors

BLM and NDOW manage all raptor species as important and sensitive species. Nests of the following seven species of raptors were located along the study corridor: ferruginous hawk, red-tailed hawk (*Buteo jamaicensis*), golden eagle, Cooper's hawk (*Accipiter cooperii*), prairie falcon (*Falco mexicanus*), great-horned owl (*Bubo virginianus*), and burrowing owl (*Athene cunicularia hypugea*). Golden eagle, ferruginous hawk, burrowing owl, and Swainson's hawk (*Buteo swainsoni*), considered special-status species, are addressed in greater detail in Section 3.7. Although short-eared owls (*Asio flammeus*) were observed hunting and perched in Segments B, D, E, F, and H, nests were not detected.

Two pairs of great-horned owls were observed nesting in the study corridor. Both pairs successfully nested under the I-80 bridges over the Humboldt River in Segment A (Dunphy Quad). Two red-tailed hawk nests were found, one each in Segments A and C. In both cases, the nests were more than one mile from the centerline. Foraging red-tailed hawks were observed in all segments except for A and G. Swainson's hawks were observed on Segments B, C, and D, but no nests were found.

A Cooper's hawk nest was located in the K re-route (Cortez Canyon Quad) where the route alternative would traverse a drainage. Two fledglings were observed in their nest in a pinyon tree. American kestrels (*Falco sparverius*) were numerous and observed in all segments except for B, C, D, and the K re-route. Pairs were observed and were probably nesting within the vicinity of the study corridor.

Northern harriers (*Circus cyaneus*) were recorded in Segments A, B, C, E, and F. A female bird was observed in a riparian area in Segment A (near the Humboldt River). Other nests were not located, although a pair of birds observed hunting near Beck Pass (Segment E) probably have a nest in Newark Valley. One immature harrier was also noted in this area.

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Mule Deer Range

Seasonal Range Distribution

- Yearlong
- Summer
- Winter
- Spring
- No Data

TRANSMISSION LINES

- Route Alternatives
- Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco

04/26/01

SOURCES: BLM digital data from Ely and Elko (East) Districts; BLM hardcopy interpretation from Battle Mountain and Elko (West) Districts, 1999

Figure 3.6 - 1

Primary breeding sites for prairie falcons include undisturbed cliff faces. This bird of prey is conspicuous as it forages over grasslands and other open habitat (Ryser 1985). The only nesting prairie falcons detected were a pair that successfully fledged at least two young in the K re-route. In this case, their nest was situated approximately 0.25 mile west of the centerline crossing where the line traverses the summit. Individual birds were observed in Segments A, B, E, F, H, and J.

Upland Game Birds

Four species of upland game birds were found within the study corridor: sage grouse, chukar, mourning dove (*Zenaida macroura*), and California quail (*Callipepla californica*). Sage grouse are discussed in greater detail in Section 3.7. Chukar were recorded in Segments B and C. These birds are uncommon to common permanent residents of arid, rocky annual grassland and bush and scrub habitats with available water. They occur in the Great Basin vegetation associations. Chukar forage on the ground and eat seeds of cheatgrass, other grasses, and exotic annual forbs (CDFG 1990).

Mourning doves were common and widespread throughout most of the habitat types in the study corridor. However, this species was most abundant outside the vicinity of the study corridor in Diamond Valley, along the west face of the Diamond Mountains. California quail with young were observed in Segment B. These birds are commonly found in shrub, scrub and brush, open stages of conifer and deciduous habitats, and margins of grasslands and croplands.

Other Bird Species

Common ravens (*Corvus corax*) were commonly seen throughout the entire study corridor. However, they were most numerous in the valleys of Segments B and I. Active raven nests were recorded on wooden power poles in the L re-route, on rock outcrops, and on both wooden power poles and on the H-Frame metal power poles in both Segments B and I. In the former case, an active raven nest was located approximately every quarter mile for a distance of more than 5 miles.

Reptiles

Seven species of reptiles were recorded in or near the study corridor: western whiptail (*Cnemidophorus tigris*), leopard lizard (*Gambelia wislizenii*), sagebrush lizard (*Sceloporus gracious*), western fence lizard (*S. occidentalis*), gopher snake (*Pituophis melanoleucus*), desert horned lizard (*Phrynosoma platyrhinos*), and desert short-horned lizard (*P. douglassi*).

Amphibians

The only amphibian observed in or near the study corridor was the spadefoot toad *(Scaphiopus intermontanus*). This species was recorded in Segments A, B, D, and E. Recent metamorphs were observed in Segment D. Larvae were observed in the artificial ponds near Dunphy 0.5 mile east of the centerline crossing in Segment A (Dunphy Quad). Spadefoot toads can travel dozens of miles from a water source and can inhabit portions of the study corridor away from water. In the evening, adult-sized toads were observed crossing Highway 278 east of Segment D.

Fish

Trout were observed in Huntington Creek, Walker Canyon Quad (Segment E). According to NDOW, these fish are rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salvelinus trutta*) (personal communication with M. Podborny, Biologist, August 9, 1999). The study corridor does cross Huntington Creek. Brook trout (*Salvelinus fontinalus*) and fingerlings were noted in Simpson Creek, Eureka Quad (Segment I). The study corridor does not cross Simpson Creek. The creek parallels the study corridor alignment for approximately 5 miles, but the creek's channel is located several hundred feet lower in elevation and is no closer than 1,500 feet from the corridor.

Invertebrates

The shells of several unidentified bivalves were collected from the following creeks and springs in the project vicinity: Defue Springs, Walker Canyon Quad, Segment E; Huntington Creek, Walker Canyon Quad, Segment E; and Gleason Creek, Robinson Summit Quad, Segment J.

WILDLIFE HABITAT

Nine main habitat types were identified in the study corridor: sagebrush, salt desert scrub, pinyon-juniper woodland, greasewood, crested wheatgrass, riparian, winterfat, cultivated, and developed/disturbed lands. Table 3.6-1 summarizes habitat associations of common wildlife species found in the project area. Table 3.6-2 shows the extent to which each habitat type exists within the study corridor.

TABLE 3.6-1: COMMON WILDLIFE SPECIES BY HABITAT TYPE

WILDLIFE HABITAT TYPE	COMMON WILDLIFE SPECIES			
Sagebrush	Loggerhead shrike Chukar Horned lark Sage thrasher Lark sparrow Black-throated sparrow	Sage sparrow Brewer's sparrow Western bluebird Meadowlark Coyote Mule deer	Pronghorn Deer mouse Sagebrush vole American badger Black-tailed jackrabbit	Antelope ground squirrel Townsend's ground squirrel Sagebrush lizard Desert horned lizard Western fence lizard
Salt Desert Shrub, Winterfat, Greasewood, and Crested Wheatgrass	Loggerhead shrike Northern harrier Short-eared owl Horned lark Lincoln sparrow	Northern mockingbird Brewer's sparrow Mourning dove Long-billed curlew Richardson's ground squirrel	Mule deer Deer mouse Black-tailed jackrabbit Townsend's ground squirrel American badger	Coyote Long-tailed vole Leopard lizard Sagebrush lizard Spadefoot toad
Pinyon-Juniper Woodlands	Black-throated gray warbler Yellow-rumped warbler Cooper's hawk Red-tailed hawk Great-horned owl Hairy woodpecker	Western tanager Juniper titmouse Mountain chickadee Dark-eyed junco Cassin's finch Red crossbill	Gray flycatcher Pinyon jay Mountain bluebird Northern flicker Golden-mantle ground squirrel	Woodrat Deer mouse Bobcat Gopher snake Mule deer
Cultivated	American kestrel Prairie falcon	California quail	Pronghorn	Mule deer
Riparian	Northern harrier Black-billed magpie Yellow-headed and red-winged blackbird Brown-headed cowbird MacGillivray's warbler	Song sparrow Northern oriole Cliff swallow Bank swallow Wilson's phalarope American avocet Yellow-breasted chat	Black-necked stilt Mallard Black-crowned night-heron Great blue heron Striped skunk Cottontail rabbit	Pocket gopher Montane vole Shrew Gopher snake Spadefoot toad Trout Mourning dove

TABLE 3.6-2: WILDLIFE HABITATS AND PLANT COMMUNITY TYPES ALONG THE STUDY CORRIDOR

Wildlife Habitat Type	Corresponding Dominant Plant Species	Percentage of Study Corridor
Wyoming Big Sagebrush	Wyoming big sagebrush	48.7%
Black Sagebrush	Black sagebrush	12.8%
Mountain Big Sagebrush	Mountain big sagebrush with smaller amounts of antelope bitterbrush, green rabbitbrush, and gray horsebrush	4.8%
Basin Big Sagebrush	Basin big sagebrush and smaller amounts of rubber and green rabbitbrush	0.9%
Low Sagebrush	Low sagebrush	0.8%
Salt Desert Shrub	Shadscale, black greasewood, and winterfat	11.5%
Pinyon-Juniper Woodland	Utah juniper and pinyon pine	10.9%
Greasewood	Black greasewood	6%
Crested Wheatgrass	Crested wheatgrass	2.8%
Riparian	Herbaceous species including *Carex nebrascensis*, *C. rostrata*, and *Juncus balticus*	0.2%
Winterfat	Winterfat and smaller amounts of Indian ricegrass and shadscale	0.2%
Cultivated	Alfalfa fields, small grain fields, and cultivated pastures	0.2%
Developed/Disturbed	Roads, gravel pits, buildings, parking lots, and similar human-caused disturbances	0.1%

Sagebrush Habitats

The study corridor is dominated by sagebrush (*Artemisia* spp.) habitats (approximately 68%), including: Basin big sagebrush, mountain big sagebrush, Wyoming big sagebrush, black sagebrush, and low sagebrush. They occupy a variety of elevational, soil types, and climatic ranges and provide habitat for several species during critical seasons (e.g., breeding season). Wildlife species, such as the sage grouse and pygmy rabbit (*Brachylagus idahoensis*) (discussed in Section 3.7 Special-Status Species) depend on sagebrush for food, cover, and breeding habitat.

Salt Desert Shrub Habitat

Salt desert shrub habitat is defined as those low elevation landscapes in the temperate deserts of the Great Basin and surrounding areas in the western U.S. dominated by low growing chenopod shrubs. Shadscale (*Atriplex confertifolia*), black greasewood (*Sarcobatus vermiculatus*), and winterfat (*Krascheninnikovia lanata*) are possibly the most extensive in their dominance throughout the salt desert shrub habitat. The Great Basin dry lake beds or playas tend to be surrounded by halophytes. Moving toward these playas from higher to lower elevations (i.e., from sagebrush/grass to the salt desert shrub habitat), the precipitation decreases. These are areas of high summer temperatures, cold blowing snow in the winter, and high evaporation rates.

Pinyon-Juniper Woodland Habitat

Junipers are more widespread geographically and elevationally, going into both drier and colder habitats than the pinyons. In this portion of the Great Basin, Utah juniper (*Juniperus osteosperma*) and pinyon pine

(*Pinus monophylla*) form the tree guild. Tree heights and canopy cover vary enormously, usually increasing with elevation. Understory dominants are even more diverse than the trees, varying with seasonality, effectiveness of precipitation, and temperature.

Greasewood Habitat

This habitat type is dominated by black greasewood (*Sarcobatus vermiculatus*). The primary factors determining this site are related to soils. Soils are poorly drained with seasonal ponding. Grasses include basin wildrye (*Elymus cinereus*) and inland saltgrass (*Distichlis spicatum*). The shrub component includes the species from the salt desert shrub habitat type.

Crested Wheatgrass Habitat

This habitat type includes areas seeded with crested wheatgrass (*Agropyron cristatum*). Crested wheatgrass was usually seeded into an area with one of the big sagebrush or greasewood cover types.

Riparian Habitat

In all riparian settings, natural processes have evolved to develop a balance among the soil, water, and vegetation resources. Some of the most important herbaceous species that buffer the hydrologic forces of water in the Great Basin include: *Carex nebrascensis*, *C. rostrata*, and *Juncus balticus*. Although riparian areas constitute only a fraction of the total land area, they are more productive in terms of plant and animal species diversity and biomass per unit than the remainder of the land base.

According to the Vegetation Survey report (SEI 2000), the route alternatives combined cross approximately 1,100 "jurisdictional waters of the U.S." Not all of these "waters" are perennial, provide significant riparian wildlife habitat, or meet the legal definition of "waters of the U.S." The Vegetation Survey report tallied all blue-line streams shown on USGS topographic quadrangle maps (i.e., lines that indicate any type of drainage) (SEI and Tetra Tech EMI 2000). Wetland areas are discussed in greater detail in Section 3.4, Vegetation.

Winterfat Habitat

This habitat type, dominated by winterfat (*Krascheninnikovia lanata*), is usually found as an inclusion in the salt desert shrub type. In addition to winterfat, other important species are those of the salt desert shrub type, including Indian ricegrass (*Oryzopsis hymenoides*) and shadscale. It occurs on alluvial flats, lake plains, and lower fan piedmonts.

Cultivated Lands

This habitat type includes all cultivated areas, including alfalfa fields, small grain fields, and cultivated pastures. Several species of rodents, waterfowl, and raptors have adapted to cultivated areas (CDFFP 1988).

Developed/Disturbed

The developed/disturbed category includes roads, gravel pits, buildings, parking lots, or similar human-caused disturbances. Measured as acres of potential wildlife habitat within the 500-foot study corridor, the developed/disturbed category along the study corridor represents approximately 0.1%.

WILDFIRES

The 1999 and 2000 wildfires impacted wildlife habitats ranging from pinyon-juniper woodlands to salt desert shrub. Segments B, C, E, L, and J of the route alternatives traverse five main burn areas: Trail Canyon and Mule (Segment B), Frenchie (Segment C), Sadler (Segment E), and Crusoe (Segment J).

These burn areas are mapped on Figure 3.4-1 in Section 3.4. The vegetation and wildlife survey data were collected before the fires occurred in summer of 1999 and in 2000.

3.6.3 ENVIRONMENTAL CONSEQUENCES

The following section examines the project's likely impacts on common wildlife and wildlife habitats. As many of the route alternatives share segments (e.g., Segments A and J are common to all of the routes), the analysis first addresses impacts that are common to all of the route alternatives. It then examines impacts specific to each of the route alternatives. This serves to reduce redundancy in discussion of the impacts and to present a clearer comparison of the alternatives. A discussion of the No Action Alternative is also included.

SIGNIFICANCE CRITERIA

The following criteria were used to evaluate the significance of the impacts. Project construction and operation activities would be considered to have a significant impact on wildlife and wildlife habitat if they would:

- Substantially affect riparian habitat.
- Substantially affect habitats considered regionally rare or uncommon.
- Substantially interfere with the movement of native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or substantially impede the use of native wildlife nursery sites.
- Conflict with the provisions of an adopted Habitat Conservation Plan or other approved local, regional, or state Habitat Conservation Plan.
- Cause the substantial long-term loss and permanent reduction or substantial alteration of existing wildlife habitat or wildlife populations.

ENVIRONMENTAL IMPACTS - COMPARISON OF ALTERNATIVES

Project construction and operation would produce direct and indirect impacts to common wildlife and wildlife habitats. Direct effects include wildlife habitat disturbance, big game disturbance, and bird collisions. Indirect effects include those associated with increased human presence in remote areas and increased vehicle-related mortalities. Some impacts would be short-term (e.g., habitat removal during construction) and others long-term (e.g., habitat removal at tower locations).

Impacts Common to All Route Alternatives

The following section presents impacts to wildlife and wildlife habitat that would be common to all of the route alternatives (i.e., they would occur with any of the route alternatives).

❑ ***Impact Widlife-1: Wildlife Habitat Disturbance and Removal***

Temporary wildlife habitat disturbance and removal would be caused by construction activities. Vegetation removal, earth disturbance, and improvements to some existing access roads would be required to provide access to construction equipment and to install the transmission line towers, wires, and substation improvements. Tower installation requires clearing approximately 0.7 acre at each pole assembly and erection area. Access needs require clearing a centerline travel route for construction vehicles (12-15 feet wide on average, but expanding to 30 feet wide in rough terrain), clearing new spur roads to allow vehicles to move from existing access roads to the tower sites, and some improvements to existing dirt roads. Table 3.6-3 provides an estimate

of the temporary habitat disturbance associated with the centerline travel route for the various routes. These construction activities would temporarily reduce a small fraction of habitat available to a number of wildlife species. Revegetation of disturbed areas following construction (described in Chapter 2 and Appendix E) would make this a less-than-significant impact.

Permanent wildlife habitat removal would occur at the tower sites and the substation expansion areas. Each H-frame tower requires two 3-foot diameter holes, while each angle tower requires three 3-foot diameter holes and 10-12 buried anchors. Depending on the length of the route alternative, there would be 725 to 820 H-frame towers and 25 to 45 angle towers. The Falcon substation expansion would remove 3.2 additional acres, and the Gonder substation would remove 6.2 additional acres. These actions do not conflict with the RMPs for the project area as they would not cause a substantial loss of wildlife habitat. Considering the extensive wide open lands and wildlife habitat that exist around the transmission line and the relatively small amount of land required for the tower poles and substations, this impact would be less-than-significant. Issues related to invasive non-native species invasion is covered in Section 3.5, Invasive Non-Native Species. Habitat restoration is described in the Reclamation Plan in Appendix E.

TABLE 3.6-3: ESTIMATED TEMPORARY DISTURBANCE TO WILDLIFE HABITAT FROM CONSTRUCTION ACTIVITIES ON THE CENTERLINE TRAVEL ROUTE (IN ACRES)

Route Alternative		Basin Big Sagebrush	Mountain Big Sage-brush	Wyoming Big Sage-brush	Black Sage-brush	Low Sage-brush	Salt Desert Shrub	Winterfat	Grease-wood	Crested Wheat-grass	Pinyon-Juniper	Riparian	Cultivated	Developed / Disturbed	Hoary Cress / Other Noxious Weeds	Total Alternative Corridor
Crescent Valley (a) and (b) Route Alternatives																
(a)	Acres	0.3	31.1	270.9	105.8	3.4	118.8	1.6	47.4	9.3	79.8	2.8	2.7	0.7	1.5	**676.1**
	%	0.0%	4.6%	40.1%	15.6%	0.5%	17.6%	0.2%	7.0%	1.4%	11.8%	0.4%	0.4%	0.4%	0.2%	**100.0%**
(b)	Acres	0.3	35.4	271.9	97.5	3.4	118.8	2.2	46.1	9.3	85.1	2.8	2.7	0.7	1.5	**677.8**
	%	0.0%	5.2%	40.1%	14.4%	0.5%	17.5%	0.3%	6.8%	1.4%	12.6%	0.4%	0.4%	0.4%	0.2%	**100.0%**
Pine Valley (a) and (b) Route Alternatives																
(a)	Acres	0.0	30.8	294.3	85.6	8.1	80.7	1.6	42.5	26.7	73.4	2.8	2.7	0.7	1.1	**651.1**
	%	0.0%	4.7%	45.2%	13.1%	1.2%	12.4%	0.3%	6.5%	4.1%	11.3%	0.4%	0.4%	0.1%	0.2%	**100.0%**
(b)	Acres	0.0	35.0	295.3	77.4	8.1	80.7	2.2	41.2	26.7	78.8	2.8	2.7	0.7	1.1	**652.8**
	%	0.0%	5.4%	45.2%	11.8%	1.2%	12.4%	0.3%	6.3%	4.1%	12.1%	0.4%	0.4%	0.1%	0.2%	**100.0%**
Buck Mountain Route Alternative																
	Acres	10.7	31.1	283.7	75.9	6.8	63.6	1.3	21.5	20.6	92.0	0.9	0.0	0.0	0.4	**608.3**
	%	1.8%	5.1%	46.6%	12.5%	1.1%	10.5%	0.2%	3.5%	3.4%	15.1%	0.1%	0.0%	0.0%	0.1%	**100.0%**

** Estimates are based on assumption of a 30-foot wide centerline travel route for construction equipment, which represents a worst-case scenario. The actual width of the centerline travel route will likely be only 12-15 feet for much of the route.*

Source: SEI and Tetra Tech EMI 1999-2000 field surveys.

❑ ***Impact Wildlife-2: Disturbance of Mule Deer and Pronghorn in Seasonal Habitat***

Short-term disturbance and loss of mule deer and pronghorn habitat would occur during construction activities within the construction corridor, on spur roads, at material yards, and at tower assembly and erection areas. Critical life stages of mule deer and pronghorn are closely tied to annual seasons; they use different portions of their range at different times during the year

(FERC 1995). Access to winter ranges for mule deer and pronghorn is important because these areas represent an important source of food during the critical winter months. As construction would affect only a small percentage of available range for mule deer and pronghorn, this is not considered a significant impact. However, the following mitigation measure can be used to avoid disturbance during seasonal migration periods. Installation of the towers and expansion of the substations would result in a minor long-term loss of big game habitat; however, this would not be a significant impact.

❑ ***Mitigation Measure Wildlife-2***

Construction activities would be scheduled to avoid the winter and early spring use period for mule deer and pronghorn, from November 1 through April 15 (personal communication with K. Wilkinson, BLM Elko Field Office, July 19, 2000). One area common to the Pine Valley and Buck Mountain Alternatives would require seasonal restrictions, the Dry Hills – Cortez Range winter area (Segment C). Additionally, Antelope Summit and Robinson Summit along Segment J are considered critical congregation areas for mule deer in winters with heavy snow (Perkins 2001). These two areas would require seasonal closure if winter snows become excessive. These areas would be defined in the field by BLM or NDOW biologists should conditions warrant closure. Mule deer range by alternative is summarized in Table 3.6-4.

TABLE 3.6-4: MULE DEER RANGE BY ROUTE ALTERNATIVE

ROUTE LENGTH WITHIN MULE DEER RANGE							
Route Alternative	Winter Range		Summer Range		Yearlong Range		Total Length
	Miles	%	Miles	%	Miles	%	(Miles)
Crescent Valley							
(a)	10.03	5.4%	8.17	4.4%	19.55	10.5%	185.93
(b)	12.21	6.6%	8.17	4.4%	19.55	10.5%	186.39
Pine Valley							
(a)	10.66	6.0%	8.17	4.6%	19.55	10.9%	179.06
(b)	12.84	7.2%	8.17	4.6%	19.55	10.9%	179.52
Buck Mountain							
	2.66	1.6%	10.67	6.4%	54.02	32.3%	167.28

Source: DOI 1987a, 1986b, 1987c. BLM Digital and Hardcopy Data, 1999.

❑ ***Impact Wildlife-3: Loss and Displacement of Wildlife***

Direct mortality of small mammals, reptiles, and other less mobile species is expected as a result of the use of construction vehicles and equipment and increased human presence after construction. Off-road overland travel within the corridor would cause the loss and disturbance of some wildlife and wildlife habitat (e.g., small mammals or reptiles whose burrows would be within the corridor). However, direct wildlife mortalities and displacement of wildlife are expected to be minor as a result of construction activities due to the minimal amount of habitat physically disturbed relative to the surrounding available habitat. Animals displaced due to the project would be able to return to the construction area once construction activities have ceased. No mitigation measures are necessary.

❑ ***Impact Wildlife-4: Indirect Impacts on Wildlife from Increased Human Presence and Access***

Construction, reclamation, and maintenance activities would increase human presence in the area and displace wildlife to other habitats that may or may not be able to support additional individuals. This increased human presence could reduce the reproductive success of local

wildlife populations, including songbirds, small mammals, and reptiles, as well as result in burrow disturbance and nest abandonment.

The right-of-way corridor and new spur roads may lead to increased human access, intrusion, illegal hunting, harassment of wildlife, off-road vehicle use, and noise. This increased human access may cause direct (e.g., mortality due to increased vehicular activities) or indirect (e.g., poaching) loss of wildlife. Poaching is often the greatest adverse impact to wildlife as a result of increased human access, particularly for big game species (BLM 1996). Large raptors, predators, and roosting bats may also be disturbed. In addition, the use of the right-of-way corridor and new spur roads as livestock herding driveways could impact wildlife forage. These impacts would be adverse but not significant. Some areas of critical winter habitat for mule deer are prone to excessive human access. In these areas, additional access is not desired and could be considered a significant impact. However, these impacts could be minimized by implementing the mitigation measure below.

❑ ***Mitigation Measure Wildlife-4***

During construction activities, exclusionary flagging or fencing will be used to protect sensitive areas. Also, the centerline travel route and new spur roads would be restricted or signage would be posted to discourage unauthorized vehicle access. After construction, new spur roads and portions of the centerline travel route leading to sensitive areas would be revegetated and reclaimed to preclude unauthorized overland vehicle access. Once these areas are closed, inspections of the lines by SPPC personnel would be conducted by the occasional use of ATVs or by helicopter.

❑ ***Impact Wildlife-5: Potential Bird Electrocutions and Collisions***

The project would involve additions to two substations: the Falcon substation near Dunphy and the Gonder substation northeast of Ely. These substations may pose electrocution hazards for some birds. The wires, buswork, and support structures would attract some bird species because they provide potential roosting, perching, and nesting sites. Line switching equipment and two reactors would be added at the Falcon substation. Two reactors to control voltage and two 345/230 kV, 300 MVA transformers would be added to the Gonder substation. The heat generated by these transformers may attract wintering birds (Aspen 1995). Birds may be electrocuted when making conductor-to-conductor or conductor-to-ground contact with uninsulated equipment. Both substations would have high voltage components (230 kV and 345 kV) that provide sufficient conductor clearance to minimize bird electrocutions.

The proposed transmission line would consist of tubular steel H-frame structures with conductors and wires spaced approximately 22 feet apart. Because of the distance between the conductors and wires, the potential for bird electrocutions is very low on these structures. Usually, bird electrocutions take place when the wingspan of birds exceeds the distance between two conductors or between a conductor and a wire. Raptors are usually more at risk to this type of electrocution because of their size, distribution, and behavior. The potential for raptor electrocution does not exist as the wire spacing is approximately 22 feet and raptor wingspans are significantly smaller (e.g., golden eagle wing spans generally do not exceed 10 feet).

Bird collisions with transmission lines may occur when a transmission line or other aerial structure transects a daily flight path used by a concentration of birds, or when migrants are traveling at reduced altitudes and encounter tall structures in their path. These collisions generally occur during inclement weather or low light levels (Avian Power Line Interaction Committee [APLIC] 1994). In general, raptors are not prone to collisions with transmission lines. Studies support these claims because of raptors' keen eyesight, soaring or slow flapping flight, maneuverability in flight, use of poles as hunting perches thereby becoming conditioned to

the presence of poles, and lack of "V" formations in flight (Olendorff et al. 1986). Other studies (Edison Electric Institute 1980) suggest that collision hazard risk is heightened for the species that fly fast and direct during normal light conditions that are preoccupied by activities such as pursuing prey, engaging in courtship, defending a territory, or escaping a predator.

The risk of bird collisions is higher along wetlands, valleys that are bisected by transmission lines, and within narrow passes where transmission lines are perpendicular to flight paths (APLIC 1994). A study conducted in 1983 found that 90% of all transmission line mortalities of waterfowl occurred at wetland sites supporting large concentrations of waterfowl (Faanes 1983). In studies conducted in the northern Great Plains, transmission lines located 400 meters from water sources presented higher associated mortality than transmission lines more than 400 meters from water (Faanes 1983).

One of the largest concentrations of waterfowl and/or shorebirds in the study corridor occurs where the transmission line would cross the Humboldt River (i.e., Segment A, common to all of the route alternatives). Mitigation Measure Wildlife-5 would minimize the risk for waterfowl/shorebird collision.

❑ ***Mitigation Measure Wildlife-5***

Bird flight diverters would be installed on the transmission line at the Humboldt River crossing (part of Segment A) and the inland saltgrass flat at Whirlwind Valley (Segment B and Segment C), Cortez Mine de-watering area in Crescent Valley (Segment B) and Slough Creek (Segment G). Flight diverters should be of a design that improves the ability of birds to see the line in all light levels (e.g., through size, shape, and possibly a variety of colors). The number and color configurations recommended by the manufacturer or researchers should be used. Diverters should be maintained/replaced as needed for the life of the project. They would be installed on lines extending between 2-3 towers where the transmission line would cross the Humboldt River, and as appropriate in other areas with concentrations of waterfowl and/or shorebirds. Final installation locations within the areas noted above, the flight diverter product, and quantities to be installed will be defined in the COM Plan.

❑ ***Impact Wildlife-6: Impacts to Migratory and Resident Birds***

Project construction activities may affect nesting raptors and passerines. Impacts to ferruginous hawk, golden eagles, and burrowing owls are discussed in Section 3.7, Special-Status Species. Impacts to nesting red-tailed hawks, Cooper's hawks, prairie falcons, American kestrels, and great-horned owls would depend on the nest location relative to the transmission line, phase of their breeding period, and duration of the disturbance during construction. Impacts to breeding raptors are not anticipated based on field surveys. One exception is along the K re-route (see Impact Wildlife-10: Impact to Nesting Raptors). Breeding passerines could be adversely affected by project construction activities and result in nest abandonment, loss of territory, and loss of productivity for that breeding season. The MBTA provides legal protection for any migratory bird or part, nest, or egg of such bird listed in wildlife protection treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former USSR. Although loss of an active passerine nest site would significantly affect the specific breeding pair affected by the project, it would not significantly affect the local avian population. However, destruction of eggs or young may be perceived as a violation of the MBTA; therefore, the following mitigation measure is provided.

❑ ***Mitigation Measure Wildlife-6***

SPPC would not conduct land clearing activities in areas of active nests (i.e., vegetation removal and road improvements) during the avian breeding season (April 1 – August 31). The start and end dates of the of the season may be modified by the BLM, based on site specific information,

such as elevation, habitat, etc. If land clearing takes place during the avian breeding and nesting season, a qualified biologist would conduct pre-construction surveys along the selected route to identify nests or evidence of breeding birds (i.e., territorial response, carrying of nesting materials, transportation of food, and mating pairs). If active nests are located or evidence of nesting is observed, a protective buffer zone would be delineated around the area. A buffer of 100 feet either side of the nest is suggested. After August 31, construction activities may commence in these areas. Implementation of this mitigation measure would reduce impacts to species protected under the Migratory Bird Treaty Act.

❑ ***Impact Wildlife-7: Increased Predation from Wildlife***

The tubular steel H-frame towers would provide artificial perches for raptors in areas of open habitat. These tall structures provide adequate perching sites to survey large areas of habitat for hunting. Wildlife species, especially raptors and ravens, would receive a competitive advantage as a result of these artificial perches. Habitats previously used only to hunt occasionally could become routine hunting areas because of the increased number of available perches (Ryser 1985). Ravens could also use these structures as perches or nesting locations. In areas with concentrations of shorebirds or waterfowl, the potential impact from increased predation is considered an adverse impact (personal communication with K. Wilkinson, BLM Elko Field Office, February 22, 2001). Because the species that may inhabit these areas are considered important by local BLM biologists, mitigation measures are recommended.

❑ ***Mitigation Measure Wildlife-7***

SPPC will incorporate perch-deterrent design features for all transmission towers and place perch-deterrent devices on the crossarms of the transmission structures at the Humboldt River crossing along Segment A and other areas frequented by shorebirds or waterfowl such as the inland saltgrass flat at Whirlwind Valley (Segment B and C), Cortez Mine dewatering in Crescent Valley (Segment B) and Slough Creek (Segment G) to discourage raptor and corvid perching. The installation of perch-deterrent devices would be the primary method of reducing raptor and corvid use of transmission lines. Perch deterrents will be installed across areas of concern and will exceed one span beyond these sensitive areas; however, ultimate locations for perch deterrents will be finalized in the COM Plan.

❑ ***Impact Wildlife-8: Impacts to Wildlife from Water Resources***

Water resources, such as springs, are important for wildlife. The availability of drinking water plays an important role in the distribution of wildlife in desert ranges. During drought years, this role may be critical for upland game birds, mule deer, pronghorn, and other mammals. Construction activities in proximity to water sources may create additional stress to wildlife. Given that the transmission line would cross only a small number of water sources and construction impacts would only be temporary, this would not be a significant impacts to wildlife species. However, the following mitigation measure is recommended to minimize impacts to pronghorn antelope and mule deer.

❑ ***Mitigation Measure Wildlife-8***

To the extent practical, project construction activities should be scheduled to avoid proximity to water sources in active mule deer fawning areas. If needed, SPPC would provide alternative water sources away from the construction sites.

❑ ***Impact Wildlife-9: Impacts to Riparian Habitat***

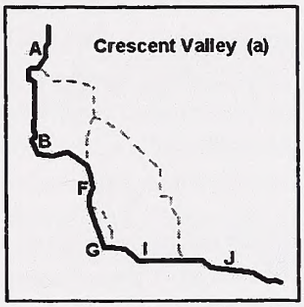
It is expected that impacts to riparian habitat, including perennial and seasonal water sources, would be avoided through strategic placement of towers outside of riparian habitat. However, if during preparation of the COM Plan sensitive riparian areas are identified that extend beyond the

maximum transmission_ line span width, BLM would require appropriate permits and mitigation measures to minimize disturbance and reduce impacts to a less-than-significant level.

Alternative-Specific Impacts

In addition to the impacts common to all route alternatives discussed above, the following presents impacts associated with specific route alternatives. Because the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

Crescent Valley (a) Route Alternative



The Crescent Valley (a) route alternative is comprised of Segments A, B, F, G, I, and J. In addition to the impacts common to all route alternatives discussed above (i.e., Impact Wildlife-1 through 9), specific impacts for the Crescent Valley (a) route alternative are listed below by their general location (segment).

Segment B

The Crescent Valley (a) route alternative would pass by two areas with large concentrations of waterfowl and/or shorebirds. Whirlwind Valley is a saltgrass flat with large concentrations of long-billed curlew (*Numenius americanus*). Another area that contains concentrations of shorebirds is approximately 0.25 mile east of the centerline in Crescent Valley and is associated with the Cortez Mine dewatering discharge area. As described under Impact Wildlife-5, bird collisions with transmission lines may occur when the line transects a flight path used by a concentration of birds. Additionally, potential impacts associated with increased predation in these areas would need to be mitigated as described in Impact Wildlife-7.

Bird flight diverters and perch deterrents (see Mitigation Measure Wildlife-5 and Mitigation Measure Wildlife-7) would be utilized in these two locations to minimize potential collisions and predation. The COM Plan would identify how many spans of the transmission lines would need flight diverters and perch deterrents at both locations. No new impacts were identified for Segment F.

K re-route (along Segment B)

During the field surveys in 1999 and 2000, an area with sensitive resources was identified near the Cortez Mountains along Segment B. The K re-route shown on Figure 2-2 was drawn as a possible way to re-route a portion of Segment B to avoid these resources. Thus, the following impact on the K re-route is being analyzed.

❑ ***Impact Wildlife-10: Impact to Nesting Raptors***

A prairie falcon pair was identified nesting on the rock outcrops near the K re-route. A Cooper's hawk nest was also identified near the K re-route. Thus, if the K re-route is selected as a partial realignment of Segment B, this could have an adverse impact on nesting raptors.

❑ ***Mitigation Measure Wildlife-10***

Pre-construction surveys would be performed to identify nesting raptors. If nesting is occurring near the K re-route, no construction activities would be allowed during the nesting season (i.e., from March 31 to July 31). Construction activities may resume once the young raptors have fledged and left the area (i.e., after July 31). No trees with raptors' nests would be cut without prior approval from NDOW and/or the BLM.

Segment G

Segment G would cross an area with seasonal concentrations of waterfowl and/or shorebirds located at Slough Creek, which is parallel to Highway 50. As discussed in Impact Wildlife-5, there would be potential for waterfowl and/or shorebirds to collide with the transmission lines, which would be an adverse but less-than-significant impact. However, mitigation is recommended to minimize this impact.

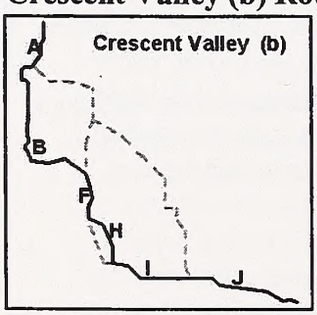
Bird flight diverters would be used on the transmission line at Slough Creek (south end of Segment G), as described in Mitigation Measure Wildlife-5. The COM Plan would identify how many spans of the transmission lines would need flight diverters.

As described under Impact Wildlife- 7, impacts around Slough Creek would require mitigation for potential impacts associated with perching birds of prey. By implementing Mitigation Measure Wildlife – 7, placement of perch deterrents would reduce these potential impacts.

Segment I

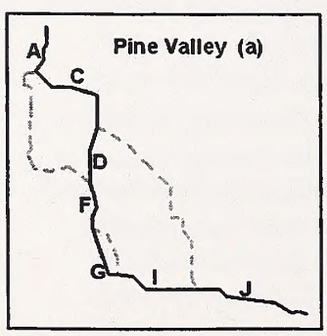
The proposed transmission line would be located in the vicinity of a mule deer seasonal range designated as crucial by NDOW: in the Diamond Mountains near Newark Pass under Battle Mountain's jurisdiction (personal communication with M. Podborny, NDOW, July 24, 2000). Although mule deer winter range also exists from Railroad Pass to the lower slopes of the Diamond Mountains, the route alternative remains in Huntington Valley away from the foothills. Therefore, the project would not affect winter habitat for mule deer from Railroad Pass to the Diamond Mountains. However, construction activities at the edge of mapped crucial winter range at Newark Pass could potentially cause disturbance of mule deer and pronghorn. Although no fawning areas have been identified in this area, fawning could occur. During development of the COM Plan, BLM wildlife biologists would determine if it is necessary to schedule construction activities to avoid the winter and early spring use period in this area (see Mitigation Measure Wildlife-2). Raptors (i.e., golden eagles) have been known to perch in the area and prey on fawns, but this event is rare. Given the rarity of this event, no mitigation measures are necessary to reduce raptor perching is this area (personal communication with M. Perkins, BLM Ely Field Office, July 24, 2000).

Crescent Valley (b) Route Alternative



The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a nearly identical alignment with the Crescent Valley (a) route, except that it uses Segment H rather than Segment G, traversing the east side of Whistler Mountain rather than the west. The Crescent Valley (b) route shares the impacts common to all route alternatives (i.e., Impact Wildlife-1 through -9) and the impacts associated with Crescent Valley (a) route, except it would avoid impacts along Segment G. No new impacts were identified for Segment H.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B. In addition to the impacts common to all route alternatives described previously (i.e., Impact Wildlife-1 through -9), the Pine Valley (a) route would involve potential bird collision impacts at Whirlwind Valley along Segment C and at Slough Creek along Segment G These two areas would also require mitigation associated with perching raptors. This route would also be in the vicinity of crucial mule deer winter range in the Newark Valley along Segment I and Segment C as described below. No new impacts were identified for Segment D.

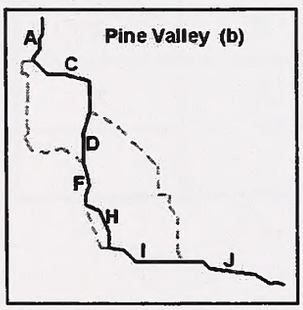
Segment C

Segment C crosses through Whirlwind Valley where inland saltgrass provides nesting habitat for long billed curlews and other shore birds. The potential for collision with the transmission line is greater in this area as well as the potential for increased predation. Bird flight diverters and perch deterrents (see Mitigation Measure Wildlife-5 and Mitigation Measure Wildlife-7) would be utilized at this location to minimize potential collisions and increased predation. The COM Plan would identify how many spans of the transmission lines would need flight diverters and perch deterrents at both locations.

Segment C would be located in the vicinity of a mule deer winter range designated as crucial by NDOW: Dry Hills – Cortez Range under Elko's jurisdiction (personal communication with K. Wilkinson, BLM Elko Field Office, July 19, 2000). No fawning areas have been identified near Segment C. Construction activities near crucial winter range would be considered a potentially significant impact. To reduce this impact to a less-than-significant level, SPPC would implement Mitigation Measure Wildlife-2 (i.e., scheduling construction activities to avoid seasonal migration periods for mule deer and pronghorn during the winter and early spring use period of November 1 through April 15). An additional mitigation measure specific to Segment C is listed below.

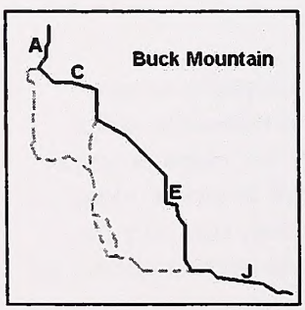
In addition to implementing Mitigation Measure Wildlife-2, SPPC would implement Mitigation Measure-4 for indirect impacts associated with the project where Segment C crosses crucial winter range (personal communication with K. Wilkinson, BLM Elko Field Office, July 19, 2000, and January 23, 2001). During construction activities, the centerline travel route and new spur roads would be restricted or signage would be posted to discourage unauthorized vehicle access. After construction, new spur roads and portions of the centerline travel route would be revegetated and reclaimed to preclude unauthorized overland vehicle access and discourage use of the right-of-way as new livestock driveway.

Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west. The Pine Valley (b) route alternative would have largely the same impacts as Pine Valley (a) route, except it would avoid the potential bird collision and predation impacts near the Slough Creek along Segment G.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. It shares the impacts common to all route alternatives (Wildlife Impact-1 through-9), including the disturbance of crucial mule deer winter range habitat in the Dry Hills – Cortez Range along Segment C. Buck Mountain is the only route that uses Segment E, which would also pass through crucial mule deer and pronghorn winter range, as described below.

Segment E

The proposed transmission line would be located in the vicinity of a mule deer winter range designated as crucial by NDOW. The route would pass through pronghorn habitat in Newark Valley near Buck Mountain (personal communication with M. Podborny, NDOW, July 24, 2000). Near the south end of

Buck Mountain, the route would pass over Barrel Spring, which is located on private land and is the primary water source for pronghorns in this portion of the valley. Construction activities near crucial winter range would be considered a potentially significant impact unless Mitigation Measure Wildlife-2 is implemented in the southern end of Buck Mountain, during the winter use period of November 1 through April 15. Although no fawning areas have been identified in this area, fawning could occur.

Summary Comparison of Route Alternatives

TABLE 3.6-5: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Wildlife-1: Wildlife Habitat Disturbance and Removal	X	X	X	X	X
Impact Wildlife-2: Disturbance of Mule Deer and Pronghorn in Seasonal Habitat	X	X	X	X	X
Impact Wildlife-3: Loss and Displacement of Wildlife	X	X	X	X	X
Impact Wildlife-4: Indirect Impacts on Wildlife from Increased Human Presence and Access	X	X	X	X	X
Impact Wildlife-5: Potential Bird Electrocutions and Collisions	X	X	X	X	X
Impact Wildlife-6: Impacts to Migratory and Resident Birds	X	X	X	X	X
Impact Wildlife-7: Increased Predation from Wildlife	X	X	X	X	X
Impact Wildlife-8: Impacts to Wildlife from Water Resources	X	X	X	X	X
Impact Wildlife-9: Impacts to Riparian Habitat	X	X	X	X	X
Impact Wildlife-10: Impact to Nesting Raptors (K re-route along Segment B)	X	X			

RESIDUAL IMPACTS

After mitigation, minor residual effects to wildlife and their habitat would result from temporary habitat loss and displacement of wildlife. The potential to create fragmented habitat does exist; however, fragmentation may only be a short-term impact until revegetation has occurred.

Habitat fragmentation is generally associated with converting large tracts of land with quality or rare habitats that have become isolated. The "edge" habitats, those habitats that have perturbations which result in an altered land/intact habitat ecotone, generally increase rates of predation (i.e., easier access by predators), brood parasitism, and competition (i.e., introduction of other species such as weeds) along the edge habitat. However, with respect to the project and the existing landscape, it is likely that only the potential for increased predation would be a residual impact. After reclamation, these impacts should be minimal.

In terms of competition such as the introduction of weed species, Section 3.4, Vegetation, and Section 3.5, Invasive Nonnative Species, and the Reclamation Plan in Appendix E address this issue and, therefore, the project should not have significant residual impacts. The project would not likely reduce

biodiversity, isolate habitats, or have an effect on the long-term viability of common wildlife should the recommended mitigation measures be implemented.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to existing wildlife and wildlife habitat associated with this project would not occur. However, wildlife impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

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3.7 SPECIAL-STATUS SPECIES – PLANTS AND WILDLIFE

3.7.1 AREA OF ANALYSIS AND METHODOLOGY

This section addresses special-status plants and wildlife. The study area for special-status plants consists of a minimum 500-foot wide study corridor. The study corridor for special-status wildlife consists of a minimum 2-mile wide study corridor (one mile on each side of the centerline). This section describes the regulations applicable to and the occurrence of special-status plants and wildlife in the study corridor and the methods used to obtain information on those species.

For the purposes of this Draft EIS, the term "special-status species" includes species federally listed and proposed for listing as Threatened or Endangered, Candidate, Species of Concern, Nevada State Protected species, and Nevada BLM Sensitive Species. Special-status species are plant, wildlife, and fish species that are protected by the following regulations and policies:

- Listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (50 CFR 17.11 [listed animals], 50 CFR 17.12 [listed plants], and various notices in the Federal Register for proposed species);
- Candidates for possible future listing as threatened or endangered under the federal Endangered Species Act (58 FR 188: 51144-51190, September 30, 1993); and
- Species protected in Nevada (wildlife: NRS 501.100 - 503.104; and plants: NRS 527.050 and NRS 527.260 - 527.300).
- Nevada BLM Sensitive Species (BLM Manual 6840)

Other special-status species are species that have "special-status" designations 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 (former federal C2 candidates); and
- Cacti, yuccas, and Christmas trees protected by Nevada state law (NRS 527.060-527.120).

REGULATORY FRAMEWORK

Federal Endangered Species Act

Pursuant to the federal Endangered Species Act (ESA) of 1973, the USFWS has authority over projects that may affect the continued existence of a species federally listed as Threatened or Endangered. If a development may affect a federally listed species, federal consultation under Section 7 of ESA is required. Under ESA, the definition of "take" includes to kill, harm, or harass any federally listed species. The USFWS has interpreted the definition of harm to include significant habitat modification. As the Falcon to Gonder project would not affect Endangered, Threatened, or Candidate species, no Section 7 consultation is required.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668) applies mostly to taking, hunting, and trading activities that involve any bald or golden eagle. The act prohibits the "taking" of any individuals of these two species, as well as any part, nest, or egg. The term "take" as used in the act includes "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb."

BLM Policies

In Nevada, the BLM has implemented policies for special-status species found on BLM-managed lands. BLM's list of special-status species includes the following three categories: (1) federally listed as Threatened or Endangered, Proposed and Candidate species; (2) Nevada State Protected species; and (3) Nevada BLM Sensitive Species. Nevada State Protected species that meet BLM's 6840 (BLM 1988) policy definition includes a total list of 25 animal species and 13 plant species occurring on BLM-managed lands. The BLM affords these species the same level of protection as federal Candidate species. Nevada BLM Sensitive Species (BLM Manual section 6840.06 C [BLM 1988]) are not federally listed, nor state-listed, but the BLM affords them the same level of protection as federal Candidate species. BLM Sensitive Species are species for which population viability is a concern. Concern is warranted by a downward trend in population numbers, density, or habitat conditions that would reduce a species' existing distribution. The BLM is responsible for ensuring that its actions do not cause Sensitive Species to become Threatened or Endangered. Several special-status wildlife species listed later in this section are considered Sensitive Species by the BLM and are afforded protection.

Nevada Regulations

The State of Nevada does not have its own version of the federal Endangered Species Act. However, the NDOW has established a list of species that are declining in all or portions of their range within the State of Nevada. NDOW's listed species are "protected" under the authority of NRS 501.100 - 503.104 (wildlife), and NRS 527.050 and NRS 527.260 - 527.300 (plants). When these species occur within BLM-managed lands, the BLM affords them the same level of protection as federal Candidate species.

In addition, under the authority of NRS 527.060 to 527.120, it is unlawful to remove or damage cacti, yucca, and Christmas trees without written permission from the legal owner. However, NRS 527.090 states that "This section does not apply to necessary cutting or trimming of such plants if done for maintenance of electric transmission lines, telephone lines or other property of a public utility, or to a logging operation. (Added to NRS by 1957, 319; A 1961, 108; 1977, 780, 1167)." As applied, the regulations for cacti are applied to sensitive species of cacti. The regulations for Christmas trees apply to retail sales of Christmas trees (personal communication with John Christoferson, NDOW, June 22, 2000).

METHODOLOGY

Wildlife and vegetation surveys in the study corridor were conducted by Summit Envirosolutions, Inc. (SEI) and Tetra Tech EMI (1999, 2000). The affected environment for special-status plants and wildlife described below is based on those surveys. The field surveys were conducted during the spring and summer of 1999. In spring of 2000, an additional survey of the L re-route was performed. Additional surveys for active sage grouse leks were also conducted in the spring of 2000 and covered the ten route alternative segments (A through J) and the K and L re-routes.

The study corridor for special-status wildlife surveys extended a minimum of one mile on each side of the centerline and a minimum of 250 feet on each side of the centerline for special-status plant surveys. Additional information was provided by resource agency staff from the BLM, NDOW, and USFWS to identify the special-status plants and wildlife that may occur within the study corridor. A copy of the report on sage grouse is provided in SEI (2000). Two protocol-level surveys (i.e., in 1999 and 2000) for active sage grouse leks were conducted by helicopter one-half hour before sunrise and two hours after sunrise. The helicopter followed the centerline for all the route alternatives and searched for suitable habitat within 2.5 miles of the centerline. In addition, for the preparation of this EIS, current lists of special-status plants and wildlife were obtained from the USFWS on March 21, 2000, and from the BLM.

Information on special-status plant species occurrences in the study corridor was obtained from the USFWS, the Nevada Natural Heritage (NNHP) program, and the BLM to identify known occurrences and potential habitat of threatened, endangered, candidate, and other special-status plants that might occur along the proposed alternatives for the transmission line. This information is contained in the Falcon to Gonder 345 kV Transmission Line Vegetation Survey report (SEI and Tetra Tech EMI 2000). Additional information on plant species' habitat requirements, blooming periods, and field identifying characters was obtained from state (Kartesz 1983) and regional (Cronquist et al. 1986-1997, Abrams 1981) floras. Based on the information and a plant community survey conducted in May and July 1999, a list of special-status plant species potentially found in the study corridor was compiled. Known and reported occurrences of the special-status plant species were mapped on 7.5-minute quadrangle maps for field reference during surveys. Soils were identified and mapped for the study corridor using NRCS Soil Surveys (NRCS 1980a, 1980b, 1989, 1992, 1997, 1998). Nineteen potentially suitable habitat areas for the special-status plants were mapped during the plant community surveys.

The field surveys for special-status plant species, including cacti species, were performed at the optimum time for species identification, with the exception of Segment C and the K re-route. Additional surveys for special-status species should be conducted along the K re-route and portions of Segment C. Surveys conducted across the Cortez Mountains in Segment C were heavily grazed prior to the survey. The K re-route was added as a route to avoid impacts to historic resources. As a result, it was first surveyed in mid-July and was not included in the June 1999 special-status species surveys. The seasonal conditions were very dry, and most plants were not at peak time for species identification. A comprehensive survey including common and special-status plants should be conducted on the preferred route prior to construction.

Two known special-status plant occurrences reported by the NNHP were visited during the field surveys. This allowed surveyors to familiarize themselves with habitat and species identification. The plants located were Beatley buckwheat (*Eriogonum beatleyae*) in Horse Canyon and Pennell draba (*Draba pennellii*) at Hercules Gap. A third special-status plant occurrence, least phacelia (*Phacelia minutissima*), was reported in the Vininni Creek drainage, but the species was not located during the survey.

The pre-survey investigation found 10 special-status plant species with potential to occur in the study corridor (Table 3.7-1). None of these species are federally listed as endangered, threatened, or proposed for listing. Six species are federal species of concern, and 9 are considered sensitive species by the BLM. One species is listed by the State of Nevada as imperiled due to rarity or other factors.

TABLE 3.7-1: POTENTIAL SPECIAL-STATUS PLANT SPECIES IN THE STUDY CORRIDOR

Common Name	Scientific Name	Elevation (feet)	Habitat	Federal* & BLM Status	NNHP** G Rank, S Rank
Monte Neva paintbrush	*Castilleja saluginosa*	6,000-6,100	Hot spring, alkali soils	C1 S	G1 S1
Pennell draba	*Draba pennellii*	6,200-10,000	Limestone rock outcrop	-- S	G2 S2
Nevada willow-herb	*Epilobium nevadense*	>7,400	Limestone talus and cliffs	-- S	G2 S2
Wind-loving buckwheat	*Eriogonum anemophilum*	5,500-10,000	Exposed ridges/slopes	SC S	G2/ G3 S2/ S3
Beatley buckwheat	*Eriogonum beatleyae*	5,600-7,800	Weathered slopes in clay	-- --	G2 S2
Lewis buckwheat	*Eriogonum lewisii*	7,000-9,000	Limestone rocky ridges	SC S	G3 S3
Least phacelia	*Phacelia minutissima*	6,000-7,000	Moist mountain slopes & flats	SC S	G3 S2
Parish's phacelia	*Phacelia parishii*	2,200-6,500	Desert alkali flats	SC S	G2/ G3 S2/ S3
Nachlinger catchfly	*Silene nachlingerae*	>9,000	Limestone soils	SC S	G2 S2
Rock violet	*Viola lithion*	7,800-10,500	Limestone rock crevices	SC S	G1 S1

*USFWS Categories for Listing under the ESA:
C1 Downlisted Candidate
SC Species of Concern (formerly Category 2)

BLM Species Classification:

S Sensitive
-- no listing

**NNHP Global (G Rank) and State (S Rank) for Threats/Vulnerability:
G Global rank indicator – worldwide distribution at species level
T Global trinomial rank indicator – worldwide no listing level
S State rank indicator at lowest taxonomic level

1. Critically imperiled, vulnerable to extinction due to extreme rarity, imminent threats, or other factors
2. Imperiled due to rarity or other factors
3. Vulnerable to decline, rare and local throughout its range, or within very restricted range

Source: SEI and TetraTech EMI 2000

3.7.2 AFFECTED ENVIRONMENT

An updated species list for the project is included in Appendix G.

DESCRIPTIONS OF SPECIAL-STATUS PLANTS

The following are brief habitat descriptions developed from database searches and state and regional flora for each of the ten special-status plant species identified as having potential to occur in the study corridor.

Monte Neva Paintbrush (*Castilleja saluginosa*) is known to occur in the Monte Neva Hot Springs area, in Steptoe Valley, approximately 20 miles north of McGill, White Pine County. The plant grows near hot springs in damp, alkali clay soils on hummocks and in shallow washes at elevations ranging from 6,000 to 6,100 feet. The plant flowers in June and July.

Pennell Draba (*Draba pennellii*) is known to occur in the South Fork of Berry Creek area, in the Schell Range of White Pine County. The plant grows in limestone rock outcrops, on slopes and ledges of the rock at elevations ranging from 6,200 to 12,000 feet. Pennell draba flowers from June to July. One population was located within the study corridor.

Nevada Willow-Herb (*Epilobium nevadense*) is known to grow in central and eastern Nevada on limestone talus and cliffs at elevations above 7,400 feet. Nevada willow-herb flowers from June to August. Suitable habitat was not located for this species. Most of the route alternatives are located in terrain below 7,000 feet.

Wind-Loving Buckwheat (*Eriogonum anemophilum*) is known to occur in the West Humboldt Range, Pershing County, to the Reese River Valley, Lander County, to the Jackson Mountain and the Sonoma Range in Humboldt County. It grows on exposed ridges and slopes on loose limestone gravel, volcanic soils, and diatomaceous and clay soils at elevations ranging from 5,500 to 10,000 feet. Wind-loving buckwheat flowers from June to September.

Beatley Buckwheat (*Eriogonum beatleyae*) is known to occur from Stewart Valley in northern Nye County, north to Horse Ranch Canyon, Eureka County, through Lander County, west to New Pass Range, Churchill County, and south to Mineral County. It grows on weathered ridgelines and slopes of gravel or clay soils with juniper at elevations ranging from 5,600 to 7,800 feet and flowers from May to August.

Lewis Buckwheat (*Eriogonum lewisii*) is known to occur from the Independence Mountains, to Elko Mountain, Elko County, and west to Mary's Mountain, Eureka County. It grows on exposed ridges in limestone soils and gravel at elevations ranging from 7,000 to 9,000 feet. Lewis buckwheat flowers from June to September.

Least Phacelia (*Phacelia minutissima*) is known to occur from Gold Creek and Stump Creek of the Independence Mountains in Elko County, NV and Owyhee County, ID. It grows on moist mountain slopes and open sunny flats in gravelly soils at elevations ranging from 6,000 to 7,000 feet. This plant flowers in July.

Parish's Phacelia (*Phacelia parishii*) is known to occur in the Muncy area and Steptoe Valley, White Pine County, to below the West Spotted Range at Mercury, south to Frenchman Flat, Nye County and alluvial flats and lakebeds in Clark County. It grows in alkaline soils on flats and alluvial slopes and valleys at elevations ranging from 2,200 to 6,500 feet. It flowers from April to July.

Nachlinger Catchfly (*Silene nachlingerae*) is known to grow in limestone soils in eastern Nevada on mountain slopes at elevations above 9,000 feet and may be found in flower from July to August. Suitable habitat for this species was not located. Most of the route alternatives are located in terrain below 7,000 feet.

Rock Violet (*Viola lithion*) is known from the White Pine and Pilot Ranges in White Pine County. This plant grows in the crevices of limestone outcrops at high elevations ranging from 7,800 to 10,500 feet. It flowers from June to August.

SPECIAL-STATUS PLANT OCCURRENCES

The affected environment for special-status plants is based on the special-status plant field surveys. Potential special-status plant species habitat locations and results of the surveys are summarized in Table 3.7-2. One species, Pennell draba, a BLM Sensitive species, was documented during the floristic surveys. The population and its habitat, limestone rock outcrop, was found within 200 feet to the north of the proposed centerline of Segment J at Hercules Gap. This population was a known occurrence reported by the NNHP. A photo of Pennell draba is provided in Figure 3.7-1. A map of the Hercules Gap Pennell draba occurrence and habitat area is provided in Figure 3.7-2.

TABLE 3.7-2: SPECIAL-STATUS PLANT SPECIES FIELD SURVEY RESULTS

Survey Area Name and Legal Description[1]	Survey Date	Species	Survey Results
The Geysers T31N, R48E, Sects 7,17	6/14/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No potential habitat and/or plant occurrence areas found.
Alkali flat T31N,T32N, R48E, Sects 33,4	6/14/99	*Phacelia parishii*	No plant occurrences found in potential habitat areas.
Cortez Canyon-east slope T26N, R47E, Sects 1,36	6/14/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No potential habitat and /or plant occurrence areas found.
Denay Valley-Garden Valley T25N,R50E, Sects 3,4,33,34	6/14/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No plant occurrences found within potential habitat areas.
Coffin Mtn – west slope Dry Creek T28N,R52E, Sects 27,28	6/14/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No plant occurrences found within potential habitat areas.
Sulphur Springs Range T27N, R53E, Sects 5,6,7,8	6/15/99	*Eriogonum beatleyae*	No potential habitat and/or plant occurrence areas found.
Garcia Flat to Railroad Pass T26N,R54E Sects 4,5,9,10,14,15,23,24	6/15/99	*Phacelia parishii* *Eriogonum beatleyae*	No potential habitat and/or plant occurrence areas found.
Black Mtn, Pinyon Range T27N,R53E Sects 5,8,9,16,15,23,25	6/17/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No potential habitat and/or plant occurrence areas found.
Huntington Valley T24N,R56E, Section n/a	6/15/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No potential habitat and/or plant occurrence areas found.
Buck Pass T22N,R57E Sects 18,19,20,28,29,32,33	6/15/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No plant occurrences found within potential habitat areas.
Beck Pass T21N, T20N,R57E Sects 3,4,33,34	6/15/99	*Eriogonum anemophilum* *Eriogonum beatleyae*	No plant occurrences found within potential habitat areas.
Butte Mountains T19N,R59E Sects 31,5,8,9,16,15,14	6/15/99	*Eriogonum beatleyae* *Draba pennellii* *Viola lithion*	No plant occurrences found within potential habitat areas.
Egan Range-Robinson Summit T18N,R60E, R61E, R62E Sects 15,14,24,19,20,21,22,26,25,30,29, 28	6/15/99	*Draba pennellii* *Viola lithion*	No plant occurrences found within potential habitat areas.
Egan Range/Smith Valley area T18N,T17N,R62E Sects 33,34,35,2,1	6/16/99	*Draba pennellii* *Viola lithion*	No plant occurrences found within potential habitat areas.
Hercules Gap T17N,R63E Sects 9,16	6/16/99	*Draba pennellii* *Viola lithion*	*Draba pennellii* habitat and plants found within approximately 200 feet north of Segment J.
Roberts Mtns/Mount Hope west slope T22N,R51E & R52E Sects 26,35,2,11,12	6/16/99	*Eriogonum anemophilum* *Eriogonum beatleyae* *Phacelia minutissima*	No potential habitat and/or plant occurrence areas found.
Muchacho Spring Newark Valley T19N,R55E, Sects 31,32,33	6/17/99	*Draba pennellii* *Viola lithion* *Eriogonum beatleyae*	No potential habitat and/or plant occurrence areas found.
Strahlenberg Mountain T19N,R54E Sects 7,8,17,16,21,22,27,26,36	6/17/99	*Draba pennellii* *Eriogonum beatleyae*	No potential habitat and/or plant occurrence areas found.

[1]The legal description includes the portions of those sections intercepted by the proposed alternative routes.
Source: SEI, 1999

FIGURE 3.7-1: PENNELL DRABA

Pennell draba (*Draba pennellii*) population at Hercules Gap growing with *Petrophyton caespitosum*. Pennell draba plants have the darker green leaves and small white flowers on the right. *Petrophyton caespitosum* plants have light green leaves and erect flower stalks.

During the vegetation surveys, cacti species were encountered infrequently. They included Mojave prickly pear (*Opuntia erinacea*) and hedgehog thistle (*Pediocactus simpsonii* var. *simpsonii*), both considered common species. No additional special-status plant populations were found in areas surveyed for special-status plant species during the June 1999 surveys.

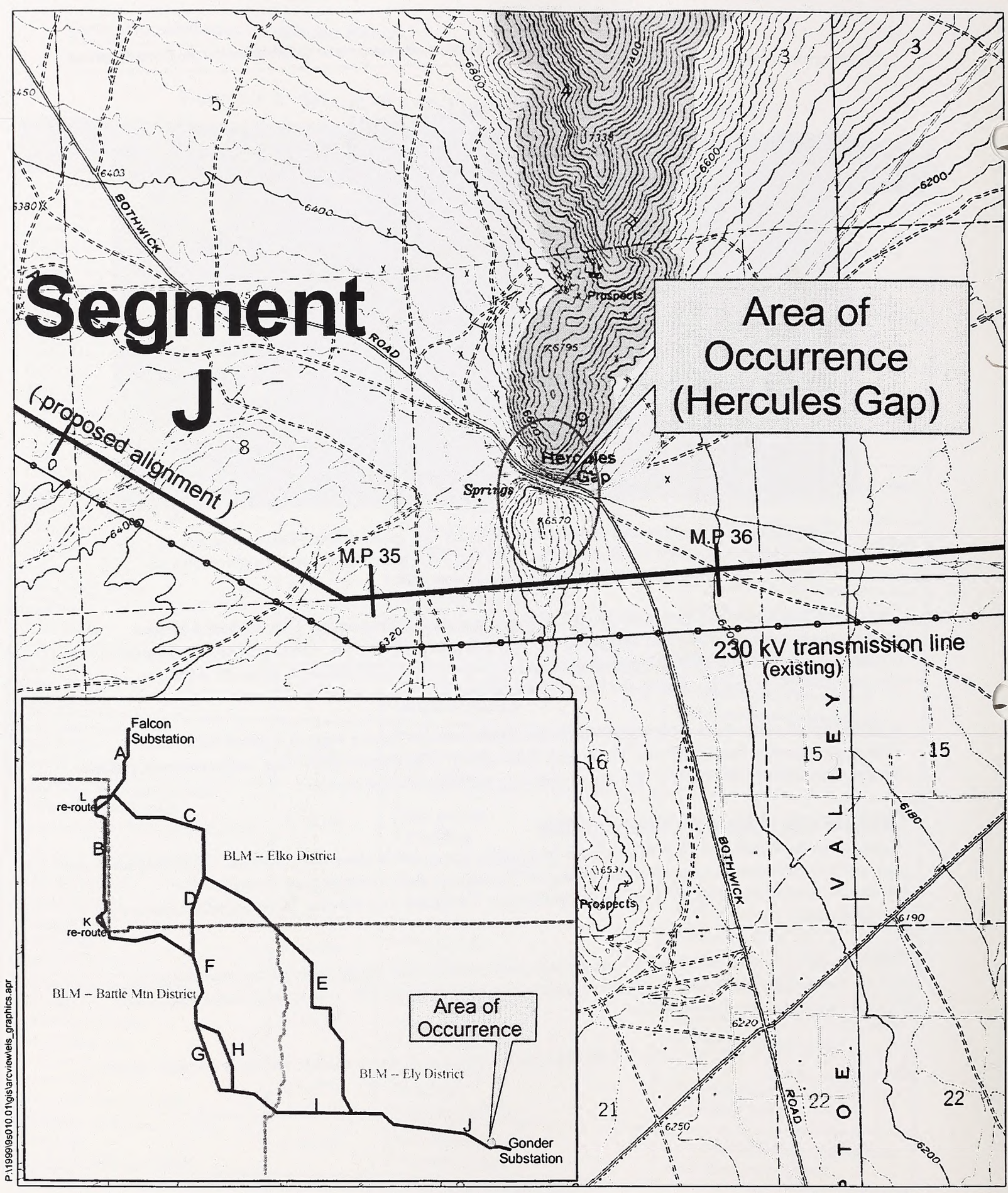
A partial list of plant species observed within the study corridor during surveys is provided in the Vegetation Survey report (SEI and Tetra Tech EMI 2000). The development of a comprehensive plant species list for the entire project was not included in the scope of the survey.

Descriptions of Special-Status Wildlife

This section describes special-status wildlife that might occur within the study corridor. Wildlife species that are federally listed or proposed for listing as Threatened or Endangered are described first. Candidate, USFWS Species of Concern, Nevada State Protected, and Nevada BLM Sensitive Species are also discussed.

Table 3.7-3 lists special-status wildlife that potentially occur within the study corridor, including 11 special-status birds, nine special-status mammals, one special-status fish, one special-status amphibian, and four special-status invertebrates.

Please refer to Figures 3.7-3 and 3.7-4 for the location of special-status wildlife and their habitats within the study corridor.



Source: Summit Envirosolutions (1999)

Area with Pennell draba (Draba pennelli) Habitat & Population

1000 0 1000 2000 3000 4000 Feet

N

Scale 1 : 24,000
(1" = 2000 ft)

Figure 3.7 - 2

TABLE 3.7-3: SPECIAL-STATUS WILDLIFE KNOWN OR POTENTIALLY OCCURRING WITHIN THE STUDY CORRIDOR

Common Name	Scientific Name	Habitat	Status*	Potential for Occurrence	Segment
Birds:					
Bald eagle	*Haliaeetus leucocephalus*	Large bodies of water (e.g., rivers, lakes, reservoirs) for feeding, mature trees for roosts.	T	Could occur in the northernmost reaches of Diamond and Newark Valleys (wintering areas).	Potentially H and E
Mountain plover	*Charadrius montanus*	Shortgrass prairies.	PT	Not observed along the study corridor. No potential suitable habitat.	--
Sage grouse	*Centrocercus urophasianus*	Variable sagebrush habitats.	S	Sage grouse and their sign observed. 15 active leks observed along the study corridor in spring 1999. 13 active leks observed along the corridor in spring 2000.	B, C, D, E, F, G, and I Leks (1999) on B, C, D, E, F, G, and J
Ferruginous hawk	*Buteo regalis*	Open grasslands, sagebrush flats, desert scrub, low foothills, and fringes of pinyon-juniper habitat.	SC NP	Observed along the study corridor. Occupied and inactive nests located.	B, E, F, H, I, and J
Burrowing owl	*Athene cunicularia hypugea*	Open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper habitats. Abandoned mammal burrows, exposed rises.	SC NP	Several adult owls observed along the study corridor. Potentially suitable habitat present.	B, C, D, L, and potentially A
Golden eagle	*Aquila chrysaetos*	Mountainous and hilly terrain. Generally nests on rock outcrops.	NP	Observed along study corridor. Active nests located.	A, C, E, and J Occupied nests A and E
Northern goshawk	*Accipiter gentilis*	In the Great Basin usually found in aspen stringers. Casual in northern deserts.	SC NP	No potential nesting suitable habitat but one foraging goshawk was observed along the study corridor.	F
Least bittern	*Ixobrychus exilis*	Emergent marsh vegetation.	SC	Not observed along the study corridor. Nesting habitat is present in Newark and Diamond Valleys.	--
White-faced ibis	*Plegadis chihi*	Emergent marsh vegetation.	SC NP	Not observed along the study corridor. The study corridor does not pass any large historic nest site.	--
Black tern	*Chlidonias niger*	Marshes, sloughs or wet meadows.	SC S	Not observed along the study corridor. Typically found along Humboldt River 10 miles upstream of study corridor.	--
Swainson's hawk	*Buteo swainsoni*	Agricultural valleys with cottonwood, elm or other suitable nest trees	NP	Observed flying 1.5 miles from the project area. Nests were not located	Potentially D and B
Mammals:					
Pygmy rabbit	*Brachylagus idahoensis*	Stands of basin big sagebrush on alluvial fans.	SC	Potential suitable habitat present.	E and J
Preble's shrew	*Sorex preblei*	Riparian/ shrub/ grass.	SC	Potential suitable habitat present.	Potentially E

TABLE 3.7-3: SPECIAL-STATUS WILDLIFE KNOWN OR POTENTIALLY OCCURRING WITHIN THE STUDY CORRIDOR (CONT.)

Common Name	Scientific Name	Habitat	Status*	Potential for Occurrence	Segment
Spotted bat	*Euderma maculatum*	Roosts in cliff faces, feeds in variable habitats.	SC NP	Potential suitable habitat present, but the study corridor is not near known roosting sites.	--
Small-footed myotis	*Myotis ciliolabrum*	Roosts in rock outcrops feeds in shrublands.	SC S	Potential suitable habitat present, but the study corridor is not near known roosting sites.	--
Long-eared myotis	*Myotis evotis*	Roosts in buildings and caves bark high elevations.	SC S	Potential suitable habitat present, but the study corridor is not near known roosting sites.	--
Fringed myotis	*Myotis thysanodes*	Roosts in caves, adits, buildings, and high elevations.	SC S	Potential suitable habitat present, but the study corridor is not near known roosting sites.	--
Long-legged myotis	*Myotis volans*	Roots trees, crevices buildings.	SC S	Potential suitable habitat present, but the study corridor is not near known roosting sites.	--
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	Roosts in caves and feed in Pinyon-juniper.	SC S	Potential suitable habitat present, but the study corridor is not near known roosting sites.	--
Townsend's big-eared bat	*C. townsendii townsendii*	Roosts in caves and feed in Pinyon-juniper.	SC S	Potential suitable habitat present, but the study corridor is not near known roosting sites.	--
Fish:					
Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*	Cool-water lakes and streams, pools with well vegetated and stable streambanks.	T	The study corridor is not near potential suitable habitat.	--
Amphibians:					
Spotted frog	*Rana luteiventris*	Cold permanent water habitats, marshy edges of ponds or lakes.	C	Although potential suitable habitat present, not observed along the study corridor.	--
Invertebrates:					
Mattoni's blue butterfly	*Euphilotes rita mattoni*	Variable –nectar plant buckwheat species.	SC S	Potential suitable habitat present.	Potentially all segments
Grey's silverspot butterfly	*Speyeria atlantis greyi*	Cool forest, near streams and wet meadows at elevations from 8,500 to 10,000 feet.	SC S	No potential suitable habitat present in the study corridor.	--
Nevada viceroy	*Limenitus archippus lahontani*	Willow stands for larvae.	SC S	Potential suitable habitat present but not observed along the study corridor.	Potentially A
California floater	*Anodonta californiensis*	Freshwater streams/rivers with slack water.	SC S	No potential suitable habitat present.	--

***USFWS Categories for Listing under the ESA:**

E Endangered
T Threatened
PT Proposed Threatened
C Candidate
SC Species of Concern- Formerly Category 2

BLM Species Classification:

S Nevada BLM Sensitive Species
NP Nevada State Protected species

Source: SEI 2000

SPECIES FEDERALLY LISTED OR PROPOSED FOR LISTING AS THREATENED OR ENDANGERED

Special-Status Birds

Bald Eagle (*Haliaeetus leucocephalus*). The bald eagle, federally listed as Threatened, frequents northern Nevada, including White Pine and Eureka counties during the winter. According to Herron et al. (1985), traditional wintering areas extend from northern Eureka east to Ely, including Diamond, Newark, and Long Valleys. Valley areas in Nevada with large populations of black-tailed jackrabbits typically support congregations of wintering eagles (Herron et al. 1985). The study corridor does not cross traditional wintering areas, except for the northernmost reaches of Diamond and Newark Valleys. Neither bald eagles nor potential roost sites were located during the surveys. Potential roost sites are presumed to be located near the cottonwood stands adjacent to ranches in both valleys or within the pinyon-juniper woodlands located away from the study corridor.

Mountain Plover (*Charadrius montanus*). The mountain plover, a federally Proposed Threatened species, is a rare migrant in the Great Basin (Ryser 1985). Mountain plovers nest east of the Great Basin in the open, high plains region of Colorado and Wyoming. Shortgrass prairie habitat is the preferred nesting habitat. Although according to the USFWS letter (File No. 1-5-99-SP-183), mountain plovers have been sighted in Diamond Valley near Eureka, these birds are not thought to have nested in Diamond Valley. Mountain plovers were not observed during the field surveys. The study corridor does not traverse through or near potential suitable habitat in Diamond Valley.

Special-Status Fish

Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*). The Lahontan cutthroat trout is a federally listed Threatened species. This subspecies is native to lakes and streams throughout the physiographic Lahontan basin of northern Nevada, eastern California, and southern Oregon. The trout inhabits lakes and streams and requires spawning and nursery habitat characterized by cool water, pools in proximity to cover and velocity breaks, well-vegetated and stable streambanks, and relatively silt-free rocky substrate in riffle-run areas (USFWS 1995). According to the USFWS letter dated April 6, 1999 (File No. 1-5-99-SP-183), the Lahontan cutthroat trout occurs on the west side of Roberts Mountain in Birch and Pete Hansen Creek and Trout Creek on the west side of the Pinyon Range, all in Eureka County. The route alternatives do not cross or traverse near these creeks.

CANDIDATE, USFWS SPECIES OF CONCERN, NEVADA STATE PROTECTED, AND NEVADA BLM SENSITIVE SPECIES

Special-Status Birds

Sage Grouse (*Centrocercus urophasianus*). Sage grouse (Figure 3.7-5), a Nevada BLM Sensitive Species, may be petitioned for listing as federally Threatened, Endangered, or Candidate species due to a decline in populations throughout their range. Sage grouse are generally associated with sagebrush-dominated rangelands, from the plains to the mountains, preferably where big sagebrush (*Artemisia tridentata tridentata, vaseyana,* and *wyomingensis*) provides 15 to 40% of the ground cover (Ryser 1985, Dobkin 1995). Furthermore, the combination of big sagebrush and low sagebrush communities provides the habitat structure for different reproductive stages of the sage grouse. During the cycle of the year, the grouse utilize sagebrush for food and cover.

A few components are necessary for the sagebrush communities to provide adequate habitat. Habitat variation in the form of mosaics appears to be critical since the birds require diversity among the sagebrush for their seasonal lifecycle (Dobkin 1995). Grouse may move 50 miles or more throughout the year, occupying areas with exposed sagebrush during winter (USFS 1991). Vegetative species diversity (e.g., forbs and grasses) and canopy cover also play critical roles in habitat adequacy. The literature on

sage grouse reflects this diversity by the variation of percent canopy cover for brush, forbs, and grasses as well as for plant height and density. Little data have been published on grouse specific to Nevada, and the numbers given in this document reflect the variations in the published literature.

In spring, males prefer relatively open, rather than dense, sagebrush cover for strutting grounds. Strutting grounds (or leks) are usually located at a point intermediate between the winter and summer range (Klebenow 1985). Each male establishes a territory or court on the lek where he displays.

Located in openings or clearings in sagebrush or in areas where the sagebrush is low and scattered (e.g., grasslands, disturbed sites, low sagebrush), the territories on a lek are used only for display and mating. Strutting grounds range in size from those with only a handful of males to those with 400 or more (Ryser 1985). Most of the leks within the study corridor are located in stands of black sagebrush (*A. nova*) or openings within big sagebrush. Big sagebrush stands adjacent to the leks should have a canopy cover of 15-40% with a similar canopy cover of herbaceous plants and grasses, with the vegetation height being at least 20 cm tall. Females use this vegetative component for nesting and early brooding (BLM 1999b, Schroeder 1999, Dobkin 1995).

Winward (1991), a researcher with the Oregon State University, found that optimum sage grouse nesting habitat consists of sagebrush 16 to 32 inches tall with a canopy cover from 15-25%, and an herbaceous understory of at least 15% grass canopy and 10% canopy forb cover that is at least 7 inches tall. Ideally, these vegetative components should be on 80% of the breeding habitat for a population of sage grouse. Winward also indicated that when the canopy cover exceeds 15% in Wyoming bit sagebrush and 20% total for basin and mountain big sagebrush, grass and forb constituents decrease due to competition for resources with shrubs. Therefore, these optimal numbers may not be attainable depending on the condition of an existing sagebrush community.

After the sage grouse chicks are several weeks old, mesic areas, preferably within 2 miles of the leks, are utilized for brood-rearing and adult habitat during the summer months (Ryser 1985). Riparian meadows, especially high elevation meadows adjacent to sagebrush cover, are preferred. The presence of trees near the riparian meadows is considered a detracting factor of habitat quality due to the potential for raptor predation or the lack of suitable vegetative components. Grouse consume the leaves and buds of the more protein-rich forbs and grasses found in these riparian areas. Young grouse supplement this herbaceous diet with a variety of insects (Ryser 1985). When mesic areas are inaccessible or unsuitable, hens with broods will use sagebrush habitats with a more open canopy cover (10-25%) with the requisite forb and grass understory (Martin 1970, Wallestad 1971). Some researchers suggest that grasses and forbs have a canopy cover of at least 15% (Sveum et al. 1998). The diversity of vegetation provides the comparable protein-rich food source.

Fall habitat is defined as a mixture of low sagebrush and Wyoming big sagebrush. Sage grouse winter habitat is defined as Wyoming big sagebrush with canopy cover greater than 15% occurring either as large stands or mixed with stands of low or black sagebrush (Back 2000b). Sage grouse consume only sagebrush in the winter months; consequently, access to sagebrush is critical. Therefore, suitable winter habitat is largely determined by snow depth. Other important habitats include drainages with vigorous big sagebrush (Wyoming and basin big sagebrush) that is consistently available during severe winters (BLM 1999b). Topographic variation in the form of ridges with wide benches also adds to the quality of winter habitat.

Following survey protocol for sage grouse, helicopter surveys revealed locations of 15 active leks in spring 1999 (see Figure 3.7-3 for locations). After the 1999 surveys, sections of the proposed line segments were relocated farther away from active leks to provide 3,000 feet (0.6 mile) of separation (Figure 3.7-3). Eight of the active leks are located within 2 miles of the centerline. According to Braun (1995), a 2-mile radius is generally considered to define the core breeding complex (FERC 1995). Figure

3.7-3 shows a 2-mile radius for each active or historic lek location. Historic lek locations are documented in the NDOW Statewide Digital Database from 1960 to 1994. This database contains all historic leks recorded by resource specialists during these years.

Many of these historic leks have not been active for years. These leks are not active for one of two reasons: either the grouse populations are so low that there simply are not enough numbers to occupy all leks, or some habitat component has changed or is lacking. Unsuitable habitat could be the result of human impacts such as roads, mines, transmission or fence lines, or a vegetative component such as a closed sagebrush canopy or little suitable brood habitat (Back 2000b). Approximately 32 historic leks within 2 miles of the study corridors have not had activity for the past 2 years. For a more detailed description of findings on sage grouse, please refer to the spring 1999 and spring 2000 sage grouse surveys (SEI 2000).

Following survey protocol for sage grouse, additional helicopter surveys revealed locations of 12 active leks in spring 2000 (see Figure 3.7-3 for locations). Of the 12 active leks observed within 2.5 miles of the centerline, only four were new active leks compared to the 1999 surveys. Two of the new active leks (leks 14 and 15) sighted might be new locations of three active leks (leks 6, 7, and 8) sighted during the 1999 surveys. The wildfire that burned during August 1999 altered the vegetation near leks 6, 7, and 8. Based on the habitat conditions, it is highly likely that the birds from the previously sighted leks relocated nearby (Back 2000a). According to BLM resource staff, Jake's lek (lek 15 recorded in 1999, Segment J) located in Jake's Valley was recorded as an active lek complex during BLM's spring 2000 surveys (personal communication with Perkins, Ely BLM Field Office, 2000). Therefore, a total of 13 active leks may be accounted for in the spring 2000 data.

Ferruginous Hawk (*Buteo regalis*). The ferruginous hawk (Figure 3.7-6), a USFWS Species of Concern and a Nevada State Protected species, inhabits the open sagebrush grasslands of central and eastern Nevada (Ryser 1985). Nest sites are normally located at the interface between pinyon or juniper woodland and open sagebrush. Nest trees typically overlook broad expanses of open sagebrush or grassland from which the hawks hunt ground squirrels and rabbits. Ferruginous hawks nest in the tops of isolated trees and sometimes on rock outcrops or even on the ground on ridges overlooking valleys (Snyder and Snyder 1991). In central Nevada, ferruginous hawks almost always select nest sites in juniper trees at the interface between pinyon-juniper and sagebrush/grassland habitats (Herron et al. 1985). A pair of ferruginous hawks typically constructs and maintains two or more nests relatively close to each other and might alternate use of the nests from year to year (Herron et al. 1985; Snyder and Snyder 1991). Nest building occurs in March and April with egg laying in April. The young fledge in June or July.

The locations of the ferruginous hawk nests in the study corridor were mapped (Figure 3.7-4) and their status determined as occupied, inactive (unoccupied), or potentially occupied (these sites contain nest structures or pairs of birds observed in potential suitable habitat). The nests were typically built in juniper trees. In addition, Figure 3.7-4 shows ferruginous hawks nesting territory per NDOW resource staff.

The following two distinct areas are used by relatively large numbers of ferruginous hawks as determined by the presence of occupied and inactive nests: (1) the west-facing slopes of the White Pine Range (East of Pancake Summit Quad); and (2) the east-facing slope of the Whistler Mountains (Whistler Mountain Quad). The latter location contained the largest number of occupied nests. Although few nests were located, pairs of birds were seen on the east- and west-facing areas of the Dry Hills area (Rocky Hills and Dugout Spring Quads). Nests on the west-facing slopes are atypical as they are not situated at the lower end of pinyon or juniper woodlands.

The Ely BLM Office provided maps of known ferruginous hawk territories and written input regarding ferruginous hawk use in the study corridor of the proposed Buck Mountain route alternative (Segment

E). According to their data, ferruginous hawk territories are situated along Dry Mountain and the west flank of Buck Mountain, and habitat is present along the base of Roberts Mountain. Because ferruginous hawks use alternate nest sites and sometimes rotate amongst these sites over a period of several years, the NDOW manages all historic or inactive sites as potentially suitable habitat for nesting ferruginous hawks.

Burrowing Owl (*Athene cunicularia*). The burrowing owl, a USFWS Species of Concern and a State of Nevada Listed Species, is a small ground-nesting owl typically inhabiting relatively open shrub and agricultural lands throughout the Great Basin. It is found in desert washes, alkali scrub, desert riparian/riverine habitats, fields, grazing land, and cut banks along roads and washes (Ryser 1985). Burrowing owls nest in abandoned mammal burrows (e.g., ground squirrel, badger, and kit fox), which they enlarge and excavate (Herron et al. 1985; Ryser 1985). This species has a tendency to form breeding colonies of up to 12 pairs (Ryser 1985).

Sixteen adult owls were observed in the project surveys, and the location of these owls mapped (Figure 3.7-4). Most of the observed owls were within one mile of the centerline. According to Herron et al. (1985), locations where high populations of burrowing owls have been noted include the area south of Beowawe to Cortez, east of Beowawe to Highway 278, and then south to a point approximately 30 miles north of the town of Eureka. This area corresponds with the sites where burrowing owls were recorded during the surveys conducted for the Falcon to Gonder project.

Golden Eagle (*Aquila chrysaetos*). The golden eagle, a State of Nevada Listed Species, inhabits mountainous or hilly terrain and hunts over open country for small mammals, snakes, birds, and carrion. Mate selection begins in late January and February. Pair bonds are generally assumed to last until one mate dies. Golden eagles construct nests in steep cliffs or in tall trees (Smith and Murphy 1985). Their nests are large, bulky structures constructed from sticks that measure up to two inches in diameter, which are interwoven with smaller sticks, brush, and miscellaneous vegetation (Herron et al. 1985). Two occupied golden eagle nests were found (Figure 3.7-4). Golden eagles were also observed soaring or perched along the route alternatives.

Swainson's Hawk (*Buteo swainsoni*). The Swainson's hawk, a State of Nevada Listed Species, is a summer resident of Nevada and can be observed in the state from April through October. Nesting activities begin in April and May when the hawks arrive in their nesting territories. A pair usually returns to the nesting territory used the previous year and would often reuse the old nest if it is still available. Nests are usually in cottonwood or elm trees located in agricultural valleys, but have also been found in a variety of vegetation, including buffaloberry, serviceberry, willow trees, sagebrush, and aspen. Nests have also been located on the ground where suitable nesting habitat is lacking. The elevational range of the nest sites is from 4,000 to 6,500 feet. According to Herron et al. (1985), known nesting areas include the area north of Beowawe, both west and east along the Humboldt River and Interstate 80 corridors. Swainson's hawk were observed at three locations but nests were not located.

Northern Goshawk (*Accipiter gentilis*). Preferred habitat for the northern goshawk, a USFWS Species of Concern and a Nevada State Protected species, consists of older-age coniferous, mixed, and deciduous forests (USFS 1988). In Nevada, a typical nest site is located in an aspen stringer about 600 feet long by 75 feet wide and is placed near a small perennial stream at approximately 7,400 to 7,800 feet in elevation (Herron et al. 1985). Typically, nest trees are aspens and are located on benches or basins surrounded by much steeper slopes (Call 1979). Nesting activities extend from March through August (USFS 1992). In most areas, the northern goshawk occupies montane forests in spring and summer, with some altitudinal migration into foothills and valleys in the winter.

Sierra Pacific Power Co.

FALCON to GONDER Project

Sage Grouse

Historically Recorded Leks

Locations with 2 Mile Radius (per NDOW Statewide digital database (1960 – 1994)

NDOW – Historic Sightings (1967 – 1998)

Locally Surveyed Leks

Darling Environmental – (Survey, 1999)

Summit Envirosolutions – (Survey, 2000)

BLM – Ely District – (Perkins Field Notes, 1999)

TRANSMISSION LINES

Route Alternatives

Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco

04/25/01

SOURCES: NDOW, 1999 / Summit Envirosolutions, 1999-2000 / BLM, 1999

Figure 3.7 - 3

Sierra Pacific Power Co.

FALCON to GONDER Project

Special–Status Wildlife

Nests and Burrows with 1/2 Mile Radius

- Ferruginous Hawk Nests
- Burrowing Owl Burrows
- Pygmy Rabbit Burrows
- Golden Eagle Nests
- Ferruginous Hawk Nesting Territory (NDOW —Bradley, 1999)

TRANSMISSION LINES

- Route Alternatives
- Existing Transmission Lines (60kv or larger)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco 04/25/01

SOURCES: Summit Envirosolutions, 1999-2000

Figure 3.7 - 4

Only one observation of a goshawk was recorded in the study corridor. The bird was less than 0.25 mile west of the centerline near a spring (Garden Pass Quad). Suitable nesting habitat is present more than 5 miles west of the centerline in Roberts Mountain. The study corridor does not cross potential suitable nesting habitat of aspen.

Least Bittern (*Ixobrychus exilis hesperis*). The least bittern, a USFWS Species of Concern, is a small, secretive, marsh-dwelling heron, which prefers dense, emergent vegetation. According to NDOW (personal communication with Podborny, NDOW, 1999), this species has not been recorded in the study corridor. Potential nesting habitat is present near springs located on private land in Newark and Diamond Valleys. The study corridor (Mooney Basin Summit Quad) does pass within 0.25 mile east of one potential site, the Warm Springs Ranch. In 1999, two sightings of this species in Ruby Lake and along the Humboldt River were reported, both several miles away from the study corridor. However, least bitterns were not detected during the surveys for this project.

White-Faced Ibis (*Plegadis chihi*). The white-faced ibis, a USFWS Species of Concern and a State of Nevada Listed Species, is a summer nesting resident in the Great Basin, although a few are known to occasionally over winter. Suitable nesting habitat in the Great Basin consists of emergent marsh vegetation, with tules preferred (Ryser 1985). White-faced ibises are colonial nesters and often nest in mixed colonies with herons and egrets. The study corridor does not pass the large historic nest sites. The closest historic nest site is Ruby Lake, more than 30 miles to the northeast. Flocks of foraging ibises have been observed in Diamond and Newark Valleys, but their nesting locations are not known. Ibises were not observed during the 1999 surveys.

Black Tern (*Chlidonias niger*). The black tern, a USFWS Species of Concern and Nevada BLM Sensitive Species, is a common to uncommon nesting inhabitant at Great Basin marshes (Ryser 1985). Black terns nest on the ground, often in loose colonies. Typical nesting habitat is in marshes, sloughs, and wet meadows. Within the study corridor, black terns are found only along the Humboldt River, but more than 10 miles upstream from the crossing between the centerline and the Humboldt River. Occasional sightings are made in Ruby Valley and other isolated valleys. Black terns were not observed in the study corridor.

Special-Status Mammals

Pygmy Rabbit (*Brachylagus idahoensis*). The pygmy rabbit is a USFWS Species of Concern. The geographic range of the pygmy rabbit includes most of the Great Basin and adjacent areas of the Intermountain West. This species is typically associated with clumped stands of Basin big sagebrush where soils are usually deep and friable (Orr 1940; Jansen 1946; Wilde 1978; Weiss and Verts 1984). They occur most frequently on plains and alluvial fans dominated by basin big sagebrush (Green and Flinders 1980). Dense scrub cover helps the rabbits avoid predators and provides additional food resources (Jansen 1946; Wilde 1978). Pygmy rabbits dig relatively shallow burrows, usually in aggregations near the base of sagebrush bushes (Jansen 1946).

Pygmy rabbits were identified in two locations (Cold Creek Ranch NW Quad and Marking Corral Summit Quad). Pygmy rabbit burrows are shown in Figure 3.7-4. The study corridor does not cross these sites, and the latter site is located 2 miles north of the centerline. Potential habitat was found in areas crossed by and in the study corridor.

Preble's Shrew (*Sorex preblei*). The Preble's shrew, a USFWS Species of Concern in Elko County, has been collected in a diversity of habitats. In Nevada, the Preble's shrew was recorded from sagebrush-grassland dominated by big sagebrush, bluebunch wheatgrass, and Thurber's needlegrass (Hoffman and Fisher 1978); from seasonally wet, sagebrush-dominated communities characterized by big sagebrush,

rubber rabbitbrush, and antelope bitterbrush; and from habitats characterized by perennial streams with willows, Wood's rose, greasewood, and Great Basin wildrye (Ports and George 1990).

Preble's shrew occurs in northeastern Nevada, Elko County (Ports and George 1990). Some specimens were collected near Sheep Creek, which drains the Independence Range (34 miles north of Elko) and in the perennial willow and wild rose of the Mary's River (54 miles northeast of Elko). The southernmost record for Preble's shrew is from the south shore of Great Salt Lake, Utah (Tomasi and Hoffman 1984). For the Falcon to Gonder project, potential suitable habitat is present in portions of approximately 12 miles of Segment E through Elko County. However, no Preble's shrew were identified along the study corridor during the surveys.

Special-Status Bats

The study corridor passes by some historic mine sites that are currently being expanded (e.g., Cortez Mine). Bats usually inhabit caves, but because there are not a large number of existing caves in the study corridor, inactive mine sites provide potential habitat for bats (personal communication with Bradley, NDOW, March 30 and August 11, 1999). The Alligator Ridge area (Segment E), located approximately 3 miles northeast of the centerline, provides potential roosting habitat for bats. Most sites are located several miles south of the study corridor in the Sulphur Spring Range, although one site is located less then 1.5 miles south. Potential roosting habitat for special-status bats in natural rock features such as cliffs and large rock outcrops is located in Hercules Gap, Segment J, Ruth Quad; and the K re-route, Cortez Canyon Quad, which traverses near and over numerous large rock outcrops in pinyon-juniper habitat. NDOW's data on bat roosting sites are not available to the public unless a project is located near known roosting sites. Because the proposed transmission line is not located near known roosting sites, NDOW will not provide information on their specific locations. According to NDOW, the study corridor does not overlap with known maternity or hibernation roosts (personal communication with Bradley, NDOW, March 30 and August 11, 1999).

Surveys for bats were not conducted because of the potential for disturbance to roosting bats. In particular, the K re-route is the only segment that passes directly over a rock outcrop. Other segments may pass within one mile of rock outcrops but do not traverse outcrops.

Bat species that do not form large nursery colonies or utilize adits or caves for summer roosting may roost at any locale, whether it is beneath a rock, under tree bark, in a rodent burrow, or within a rock crevice. Bat species such as the spotted bat (*Euderma maculatum*) or the western pipistrelle (*Pipistrellus hesperus*) are such species. Little is known of the spotted bat; however, the western pipistrelle apparently occupies similar habitat and has received more research efforts. The western pipistrelle has been reported to occur in the study corridor (personal communication with Gary Back, consultant, July 10, 2000). It should be noted that just because rock outcrops exist, it does not necessarily indicate presence. For example, a study for the presence of the western pipistrelle was conducted in Utah in areas where there was an abundance of crevices (potential roost sites); only a very few provided adequate protection from predators and/or provided thermal cover (Tuttle 1996).

Spotted Bat (*Euderma maculatum*). The spotted bat, a USFWS Species of Concern and a Nevada State Protected species, has been found in a variety of habitats including ponderosa pine forest, pinyon-juniper forests, desert scrub, and open pasture and hay fields (Leonard and Fenton 1983). They are found most often in dry, rough desert terrain (Watkins 1977). Spotted bats roost alone in rock crevices high up on steep cliff faces. Critical roosting sites are cracks and crevices from 0.8 to 2.2 inches in width in limestone or sandstone cliffs (USFS 1991). Spotted bats feed mainly on moths. Spotted bat populations may be limited by the availability of suitable roosting sites. They are generally found in remote, undisturbed areas, suggesting that they may be sensitive to human disturbance (USFS 1991). According to NDOW resource staff, occurrence of spotted bats along the study corridor is unlikely because there are no known breeding or roosting colonies in the area (personal communication with Bradley, NDOW,

April 11, 2000). However, spotted bats could potentially roost in the rock outcrops along the study corridor.

Small-Footed Myotis (*Myotis ciliolabrum*). The small-footed myotis, a USFWS Species of Concern and a Nevada BLM Sensitive Species, inhabits a wide variety of habitats over its range, but mostly in forest areas, including pinyon-juniper. When suitable roost sites are available, this species is found in semiarid shrublands, sagebrush, chaparral, and even agricultural areas (Manning and Jones 1989). In Nevada, specimens have been collected over mountain streams fringed with deciduous trees (Hall 1946). Their known elevational range is from sea level to 8,500 feet. This species is an opportunistic insect-eater (Davis 1939). Small-footed myotis could potentially roost in the rock outcrops along the study corridor.

Long-Eared Myotis (*Myotis evotis*). The long-eared myotis, a USFWS Species of Concern and a Nevada BLM Sensitive Species, occurs in coniferous forests of high mountains. This species roosts in small nursery colonies of 10 - 30 bats in buildings, caves, mines, and under tree bark (Whitaker 1980). Potential suitable habitat for this species is present in and along the study corridor in the higher elevation pinyon-juniper habitat.

Fringed Myotis (*Myotis thysanodes*). The fringed myotis, a USFWS Species of Concern and a Nevada BLM Sensitive Species, primarily occurs at middle elevations (3,700 to 6,500 feet) in desert, grass, and woodland habitats, but is found to 8,500 feet in spruce-fir habitats in New Mexico (O'Farrel and Studier 1980). Roost sites have been found in caves, old buildings, and mine tunnels. This species feeds primarily on beetles. According to NDOW resource staff, fringed myotis are rare in the study corridor (personal communication with Bradley, NDOW, April 11, 2000). However, fringed myotis could potentially roost in the rock outcrops along the study corridor.

Long-Legged Myotis (*Myotis volans*). The long-legged myotis, a USFWS Species of Concern and a Nevada BLM Sensitive Species, is mainly a coniferous forest bat, although it may also be found in riparian and desert habitats in some areas. This species uses a variety of roosts including trees, crevices, and buildings. It occupies an elevational range from 200 feet to more than 10,000 feet, but is most often found between 6,000 to 9,000 feet (Warner and Czaplewski 1984). Caves and mine tunnels are used as hibernacula (Schowalter 1980). According to NDOW resource staff, this species occurs in the study corridor, but there is no evidence that roosting does occur in the study corridor (personal communication with Bradley, NDOW, April 11, 2000). Potential suitable habitat for this species is present along the study corridor.

Pale and Pacific Townsend's Big-eared Bat (*Corynorhinus townsendii pallescens; C. townsendii townsendii*). The Pale and Pacific Townsend's big-eared bats are both USFWS Species of Concern and Nevada BLM Sensitive Species. They occur in juniper-pine forests, shrub-steppe grasslands, deciduous forests, and mixed coniferous forests from sea level to 10,000 feet in elevation (USFS 1991). These species roost primarily in caves or cave analogs such as old mine shafts, but have also been known to use rocky outcrops and old buildings (Pierson et al. 1991). In winter, most individuals roost singly, although some form clusters of a few to several dozen individuals. In summer, females roost with their young in nursery roosts in warm parts of caves. Maternity colonies break up in August. Males and non-breeding females roost alone (Kunz and Martin 1982). These species are considered very sensitive to human disturbance. Entering into a nursery roost can cause abandonment of the site by a colony. According to Pierson et al. (1991) and Brown and Berry (1991), mine shafts and adits are the most important roosting habitat for western big-eared bats and other sensitive bat species and should be protected from human disturbance where possible. According to NDOW resource staff, both subspecies of bats have been known to occur in the study corridor, but sightings have been poorly documented and there is no evidence that roosting occurs in the study corridor (personal communication with Bradley, NDOW, April 11, 2000). Potential suitable habitat for this species is present along the study corridor.

Special-Status Amphibians

Spotted Frog (*Rana luteiventris*). The spotted frog, a federal Candidate species, is a large brown frog that emerges in March from winter hibernation in bottom mud (Morris and Tanner 1969). Eggs are laid in late spring and larvae transform by September. Spotted frogs appear to require cold water. They are most commonly found near permanent water in habitats such as the marshy edges of ponds or lakes, in algae-grown overflow pools of streams, and near springs with emergent vegetation. In spring and summer, the spotted frog may move considerable distances from water after breeding, often frequenting mixed conifer and subalpine forests, grasslands, sagebrush, and rabbitbrush. It is thought that spotted frogs hibernate in holes near springs or other areas where water does not freeze and is constantly renewed (USFS 1991). Although potential habitat is present, spotted frogs, larvae, or eggs were not observed in the study corridor.

Special-Status Invertebrates

Mattoni's Blue Butterfly (*Euphilotes rita mattoni*). The Mattoni's blue butterfly, a USFWS Species of Concern and a Nevada BLM Sensitive Species, is found primarily in the upper and lower Sonoran Zones, prairies, and sand dunes (Scott 1987). It has also been found in pinyon-juniper woodlands and rolling prairie grasslands (Pyle 1981). The host plant for the larvae is the buckwheat (*Eriogonum microthecum nutt. var. laxiflorum*), which is widely distributed and occurs from 5,000 to 10,500 feet in elevation. It flowers from June through October. This species of buckwheat was identified in most of the segments. Therefore, Mattoni's blue butterfly could inhabit these areas. The adult Mattoni's blue butterfly is usually active in July. Although numerous species of butterflies were observed including blues, the host plant was not observed in those areas. This species of butterfly must be distinguished from close relatives by microscopic examination, which was not done. Butterflies were not collected for examination because the blues were not seen near the host buckwheat.

Grey's Silverspot Butterfly (*Speyeria atlantis grey*). The Grey's silverspot butterfly, a USFWS Species of Concern and a Nevada BLM Sensitive Species, inhabits cool, forested elevations from 8,500 to 10,000 feet (Howe 1975). It occurs in openings of wildflowers among deciduous and coniferous forests and along streams or in moist meadows (Pyle 1981). Violets (*Viola* sp.) are the only known host plants for butterflies in the genus Speyeria. The distribution of these plants limits the available habitat the butterfly can occupy. Females lay their eggs on substrates in proximity to the violets (Brittnacher et al. 1978). This species has been recorded in the Ruby Mountains and the East Humboldt Range in Elko County, but no records of its occurrence in the study corridor were found. Violets are present in the route segments. However, this species of butterfly could not occur within the study corridor because there is no suitable habitat given the elevation requirements.

Nevada Viceroy (*Limenitus archippus lahontani*). The Nevada viceroy, a USFWS Species of Concern and a Nevada BLM Sensitive Species, occurs mainly along the Humboldt River and lower tributaries, with additional colonies near the cities of Fallon and Fernley. The Nevada viceroy is only found in the immediate vicinity of willows, which are the larval host plant. Potential habitat for this species is present where the study corridor crosses the Humboldt River. Other Lepidopteran larvae were noted in this area, including the larvae for mourning cloaks and fritillaries. However, adults or larvae of the Nevada viceroy were not observed during the field surveys.

California Floater (*Anodonta californiensis*). The California floater, a USFWS Species of Concern and a Nevada BLM Sensitive Species, is a freshwater species of mussel historically occurring in unpolluted Pacific lakes and streams of Washington, Oregon, California, Idaho, Nevada, and Utah (Bequaert and Miller 1973). Colonies are most commonly found in still or slow-moving water such as the leeward side of river oxbows (Taylor 1981). It can only survive in association with certain fish that serve as hosts for the mussel's parasitic life stage. The California floater was once abundant in the Humboldt River. Currently, the California floater is present in the North Fork of the Humboldt River but not in the

central portion of the river (personal communication with Bradley, NDOW, March 30 and August 11, 1999). The study corridor crosses the central portion of the Humboldt River. The confluence of the North Fork with the Humboldt River is located east of the town of Elko, over 30 miles away.

3.7.3 ENVIRONMENTAL CONSEQUENCES

This section discusses the potential impacts of the Falcon to Gonder project related to special-status plants and wildlife. The significance criteria, impact mechanisms, and approach for assessing adverse effects to special-status plant species are similar to those described in Section 3.4, Vegetation, and Section 3.6, Wildlife and Wildlife Habitat.

The general effects of the project on special-status plants would be similar to those discussed in Section 3.4, Vegetation. However, because of the plants' rarity, such effects can have more significant impacts to special-status species populations and habitats.

Overall, impacts to special-status wildlife species would be similar to those impacts discussed in Section 3.6, Wildlife and Wildlife Habitats. The main impacts to common wildlife include wildlife habitat disturbance, habitat fragmentation, and increased human access. However, similar impacts can have greater effects on special-status species since their distribution and abundance can be limited and their habitats are often rarer. The impacts to special-status wildlife are addressed in two categories. General impacts (i.e., impacts common to route alternatives) and mitigation measures are discussed first, followed by an impact discussion by route alternative. Where appropriate, additional site-specific mitigation is described for species occurrence in particular segments.

SIGNIFICANCE CRITERIA

Project construction and operation activities would have a significant impact on special-status species if they would:

- Substantially reduce the distribution or abundance of any species identified as federally Threatened or Endangered, Candidate, Species of Concern, Nevada State Protected, or Nevada BLM Sensitive Species.
- Result in substantial temporary or permanent loss or alteration of the habitat of federally Threatened or Endangered, Candidate, USFWS Species of Concern, Nevada State Protected, or Nevada BLM Sensitive Species that affects the distribution or abundance of those species.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to Route Alternatives

❑ ***Impact Special-Status Species-1: Possible Disturbance of Special-Status Plants***

Construction, operation, and maintenance activities could result in the disturbance of special-status plant species. These disturbance activities could potentially reduce local populations of special-status plant species. No special-status plant species populations were observed during surveys in Segments A through I. Only one population of a special-status plant was located during the field surveys. Pennell Draba is located at Hercules Gap (Segment J) within the rock outcrops. Segment J is common to all route alternatives. Significant impacts to the Pennell draba population and its habitat would be avoided and mitigated to a less-than-significant level by implementing the Mitigation Measure Special-Status Species-1, listed below.

Plant populations can vary and appear or disappear from one year to the next. In addition, surveys in Segment C and the K re-route were not possible during the optimal period for plant identification. Surveys conducted across the Cortez Mountains in Segment C were heavily grazed prior to the survey. The K re-route was surveyed in mid-July after being added as an alternative, and most plants were not at peak time for species identification. Proposed access roads, material yards, or staging areas outside of the 500-foot study corridor were not surveyed. All access roads, material yards, and staging areas would require botanical surveys to be conducted prior to any ground disturbance. No significant impacts are anticipated for special-status plants within Segments A-I. However, a comprehensive floristic survey would be conducted once a preferred alternative is selected. At that time, all proposed ground disturbance areas for that alternative would be surveyed. If special-status plants are located within the corridor, adjacent to access roads, or other areas of disturbance, impacts to special-status plants and their habitat would be avoided and mitigated to a less-than-significant level by implementing Mitigation Measures Vegetation-1, and-4, and the mitigation measure listed below.

❑ ***Mitigation Measure Special-Status Species-1: Avoid Adverse Effects on Special-Status Species During Construction and Project-Related Activities***

A comprehensive survey would be conducted prior to construction and project-related activities to identify any new special-status species populations, including Pennell draba or any other special-status species. Qualified biologists would mark exclusion zones prior to construction around identified populations. Exclusion zones would have a minimum 20-foot radius, would be marked in the field with stakes and flagging, and would be located on drawings in the COM Plan. All construction-related activities would be prohibited within these zones, including vehicle operation, material and equipment storage, and other surface-disturbing activities.

This remainder of this section describes impacts to special-status wildlife that could be associated with any of the route alternatives. The following eight special-status species would not be impacted from the development of the project because of the absence of suitable habitat in the study corridor: mountain plover, least bittern, white-faced ibis, black tern, Lahontan cutthroat trout, spotted frog, Grey's silverspot butterfly, and California floater. In addition, no significant impacts are expected to the seven special-status bats that might occur in the study corridor because the proposed transmission line would not be located near known roosting sites (personal communication with Bradley, NDOW, April 11, 2000). Bat Conservation International (BCI) was contacted with regards to potential effects of electromagnetic fields (EMF) generated by the transmission line. BCI was not aware of research on EMF and bat sonar. It is the opinion of BCI that there should not be effects unless the transmission line directly crosses a roost site (personal communication with French, BCI, July 10, 2000). However, potential impacts during construction activities might occur to more solitary species such as the spotted bat or the long-legged myotis.

Swainson's Hawks: Although Swainson's hawk nests were not found during the wildlife surveys, nesting in the study corridor is a possibility (SEI 2000). A single bird hunting from a perch on the ground in Segment B (Pete Hanson Creek Quad), less than 1.5 miles north of the centerline, was observed during field surveys, and another Swainson's was noted flying in the same area. A pair of Swainson's hawks were observed in Segment D (Mineral Hill NW Quad), approximately 1.5 miles east of the centerline during the field surveys. It is possible that the observed hawks were nesting in the study corridor, although nests were not found.

❑ ***Impact Special-Status Species-2: Potential Impacts to Swainson's Hawks***

Although Swainson's hawk nests not were found during the wildlife surveys, nesting in the study corridor is a possibility (SEI and Tetra Tech EMI 2000). Hawks were observed in the study corridor, and it is possible that the observed hawks were nesting in the project area. Swainson's

hawks may be directly impacted from removal of nest trees if their nests are located near the centerline. Or, they may be indirectly impacted from the noise and general construction activities, which could cause displacement of adults and nest abandonment. Both impacts would be considered significant, but could be mitigated to less than significant by the measure below.

❑ ***Mitigation Measure Special-Status Species-2***

To avoid disturbance to nesting Swainson's hawks, a qualified biologist, acceptable to NDOW and BLM, would conduct pre-construction surveys along the proposed line. If Swainson's hawk nests are identified along the proposed route, SPPC would avoid any construction activities within a 0.5-mile radius from any occupied Swainson's hawk nest during the nesting season, from April 15 through August 1 (BLM 1992). Occupied or inactive Swainson's hawk nests would not be removed during construction activities.

Burrowing Owls: Sixteen adult burrowing owls were observed within the study corridor. Nine burrowing owl burrows, one potential burrow, and a large colony were identified within one mile of the study corridor as shown on Table 3.7-4 and Figure 3.7-4. Nine burrows are located within 0.25 mile of existing roads; some of these roads are proposed to be used as access roads for construction.

TABLE 3.7-4: BURROWING OWL BURROWS SIGHTED ALONG THE STUDY CORRIDOR (SPRING 1999 AND SPRING 2000 DATA)

Number of Burrows	General Location of Burrows	Segment
9	Burrows within 1 mile of the centerline	C, D, L
Large colony	Burrows located 2.25 miles northeast of centerline	B
Total = at least 11		

Source: SEI 2000

❑ ***Impact Special-Status Species-3: Impact to Burrowing Owl Burrows***

Short-term direct impacts are anticipated to nesting burrowing owls from implementation of the project. During construction, burrowing owl burrows may be crushed by construction equipment using the existing access roads or new temporary spur roads. This impact would be considered a significant impact and would require mitigation. Burrowing owls may also be displaced and abandon their burrows as a result of increased human activities within the 500-foot study corridor. Burrowing owls may leave their burrows if they are close to existing access roads, new temporary spur roads, the transmission line centerline, or the construction staging areas. However, this would not be considered a significant impact due to the availability of adjacent lands that may contain potentially suitable habitat. This adverse impact may be lessened further by implementing the following mitigation measure.

❑ ***Mitigation Measure Special-Status Species-3***

Conduct pre-construction surveys to identify occupied burrows. All active burrows would be flagged by a qualified biologist prior to the beginning of construction. During construction activities, burrows near existing access roads that may require improvements, new temporary spur roads, construction staging areas, or the centerline would be avoided to prevent them from being crushed. During the construction period, areas within 150 feet of all active burrows would be classified as "no drive zones" (i.e., no construction or other vehicles would be permitted within these areas).

Golden Eagles: Two occupied golden eagle nests and one inactive golden eagle nest were identified within one mile of the centerline during the field surveys, as shown on Table 3.7-5 and Figure 3.7-4. One golden eagle nest is within 0.25 mile of an existing access road that could be used during construction.

TABLE 3.7-5: GOLDEN EAGLE NESTS SIGHTED ALONG THE STUDY CORRIDOR (SPRING 1999 DATA)

Number of Nests	Status and General Location of Nest	Segment
2	Occupied nests within 1 mile of the centerline	E
1	Inactive nest within 1 mile of the centerline	B
Total = 3		

Source: SEI 2000

❑ ***Impact Special-Status Species-4: Impact to Golden Eagle Nests***

Golden eagles may be displaced and abandon their nests as a result of construction activities along the study corridor. This impact is considered significant but could be mitigated to less-than-significant.

❑ ***Mitigation Measure Special-Status Species-4***

SPPC would avoid any construction activities within a 0.5-mile radius from any occupied golden eagle nest during the nesting season, from February 15 through July 15 (personal communication with Perkins, BLM, May 15, 2000). Although all golden eagle nests located were in rock outcrops, there is the potential for nests to be located in trees. Removal of nests or trees containing any occupied or inactive golden eagle nest would be avoided during construction activities. To avoid disturbance to unidentified golden eagle nests, a qualified biologist, acceptable to NDOW and BLM, would conduct pre-construction surveys along the proposed route.

Pygmy Rabbits: Pygmy rabbits were identified in two locations, in Segment E and Segment J as shown on Table 3.7-6 and Figure 3.7-4. The study corridor does not cross these sites, and the latter site is located 2 miles north of the centerline. However, an existing access road that could be used for project construction passes within 300 feet of one pygmy rabbit den. Although potential habitat was found in areas crossed by and in the study corridor, evidence of pygmy rabbits was not found. Potential impacts to pygmy rabbits are detailed below.

TABLE 3.7-6: PYGMY RABBIT BURROWS SIGHTED ALONG THE STUDY CORRIDOR (SPRING 1999 DATA)

Number of Burrows	General Location of Burrows	Segment
1	Burrow within 1 mile of the centerline	E
1	Burrow within 1-2 miles of the centerline	J
Total = 2		

Source: SEI 2000

❑ ***Impact Special-Status Species-5: Impact to Pygmy Rabbit Burrows***

Potential indirect impacts to rabbits in burrows could occur as a result of increased human activities along the study corridor. Pygmy rabbits could be hurt or killed and their burrows crushed during construction activities. Even a burrow located relatively far away (e.g., within one mile from the centerline) could be adversely affected by increased traffic during construction.

❑ ***Mitigation Measure Special-Status Species-5***

SPPC would conduct pre-construction surveys along the selected route to identify occupied pygmy rabbit burrows. All active burrows would be flagged by a qualified biologist prior to the beginning of construction. During construction activities, pygmy rabbit burrows near existing access roads that require improvements, new temporary spur roads, construction staging areas, or the centerline would be avoided to prevent them from being crushed. During the construction period, areas within 150 feet of all active burrows would be classified as "no drive zones" (i.e., no construction or other vehicles would be permitted within these areas).

Bald Eagles: According to NDOW (Herron et al. 1985), the study corridor traverses traditional wintering areas along the western edge of Diamond Valley near the base of Whistler Mountain for approximately 14 miles (Devon Peak and Whistler Mountain Quads) and the northernmost reaches of Diamond Valley for approximately 3 miles (Sadler Basin and Garcia Flat Quads). In Newark Valley, which encompasses Newark Lake, the study corridor traverses mapped habitat north of Buck Pass for approximately 7 miles (Mooney Basin Summit and Cold Creek Ranch Quads). However, the study corridor falls on the edge of all these mapped areas. Neither bald eagles nor potential roost sites were located in the study corridor during the surveys.

❑ ***Impact Special-Status Species-6: Potential Impact to Bald Eagles***

If wintering or migrating bald eagles are hunting within the project area during construction or maintenance activities, bald eagles may leave the disturbance area and forage elsewhere. Construction-related noises, traffic, or other human activities would likely keep the eagles from hunting near the project corridor while these actions are taking place. However, these impacts are not considered significant as the study corridor falls on the edge of NDOW mapped bald eagle winter foraging areas and the study corridor does not provide suitable roosting sites, potential perches and generally does not provide adequate foraging habitat (i.e., too dry). Therefore, mitigation measures are not necessary.

Northern Goshawk: Only one observation of a northern goshawk was recorded in the study corridor. The bird was less than 0.25 mile west of the centerline near a spring (Segment F; Garden Pass Quad). In general, the project area does not provide suitable habitat for nesting or foraging for goshawks; the observed bird was likely a fly-over. Because suitable nesting habitat is present more than 5 miles west of the centerline in Roberts Mountain and the study corridor does not cross potential suitable nesting habitat of aspen, no significant impacts to the northern goshawk are expected from implementation of the project. No impacts are anticipated, and no mitigation measures would be necessary.

Sage Grouse: Potential impacts to sage grouse may result from the construction and operation of the project. Potential impacts include habitat disturbance to sage grouse breeding and brooding ranges, and winter and summer ranges. Disruption of seasonal movements or habitat fragmentation could occur through increased raptor predation or harassment near leks. Sage grouse may also perceive the towers as potential predatory bird perches near lek areas and abandon the lek site. Mitigation efforts that can be incorporated into the design or construction of the transmission line are considered on-site mitigation and are detailed in the discussion for each segment. In instances when on-site impacts cannot be avoided or mitigation is inappropriate, off-site mitigation is proposed.

Impacts to active leks would be considered significant. Pre-construction and construction activities could adversely affect sage grouse mating activities in those active leks. The construction of the transmission line in previously undisturbed habitat may introduce potential impacts in the following three ways. Hall (In press) determined three potential impacts to sage grouse from implementation of transmission lines: (1) harassment and/or direct predation of adult sage grouse by raptors and ravens using poles as perches; (2) direct predation (mostly by ravens) of nests, young, and nesting females in proximity to leks; and (3) the reaction of sage grouse in leks to the presence of visible perches. Raptors included mostly golden

eagles, but also ferruginous hawks, prairie falcons, northern harriers, red-tailed hawks, and rough-legged hawks.

Hall (In press) found that direct collisions of sage grouse with overhead lines or collisions were minimal compared to impacts from poles as raptor perches. However, sage grouse may fly greater distances during harsh winter conditions, flying from areas where suitable forage is accessible to higher elevation snow roosts. During these periods of inclement weather and low visibility, all avian species have a greater chance of colliding with a transmission line.

A potential impact resulting from the introduction of an overhead transmission line into occupied sage grouse habitat is due to the potential for raptors to use the support structures for hunting perches and nest sites. Raptors can prey on sage grouse from these vantage points. Corvids (e.g., ravens and crows) also use the structures for nest building, thereby increasing the population of these species. Like raptors, the corvids can also use the structures as hunting perches, primarily to locate sage grouse ground nests when the hen leaves the nest. As a result of increased raptor or corvid populations and/or predation, sage grouse leks near transmission lines are often abandoned.

Increased raptor and corvid use of the support structures for nesting or as hunting perches can result in increased predation at leks, nesting habitat, brood habitat, and winter habitat (Back 2000a). In addition, sage grouse may perceive tubular steel H-frames as potential predator perches and could leave that lek if a tower is located nearby. According to Braun, sage grouse would abandon habitat within 0.5 mile of either side of a transmission line centerline (Braun 1997) because transmission line structures may provide potential raptor perches, which cause sage grouse to abandon suitable habitats. Impacts to all historic and active sage grouse leks are detailed below in the discussion for each route alternative segment.

Many factors enter into account when increased predation or harassment occurs as a result of a transmission line in an area. The shorter the distance between the active lek and the transmission line, the more effective raptors can be in either preying upon or harassing birds during breeding activity. The direction from the transmission line to the active lek may also be a factor. Leks located west of a transmission line provide for the early morning sun to be at the predator's back and directly on the strutting ground, making it difficult for sage grouse to see the predator, but making the sage grouse highly visible to the raptor. The opposite situation occurs when the lek is east of the transmission line. The background of the view from the lek to the transmission line may also influence the effectiveness of the predator. A transmission line with a mountain range in the background would tend to camouflage a raptor, whereas a transmission line silhouetted against the sky would tend to accent the position of the raptor. The slope and aspect where a lek is located relative to the transmission line also need to be considered. A lek located on a slope that faces away from the transmission line is not visible to the perched raptor, depending on the distance to the line and height of the support structure.

The topography between the transmission line and the lek is also a factor determining the impact of the transmission line. Any land feature that interrupts the line of sight effectively hides the lek from a perched predator. These factors do not make a lek immune from predation, but they can reduce the frequency of hunting forays and provide a sense of security that sage grouse may not have when in full view of the transmission line. Consequently, it cannot be equivocally stated that an active lek within some distance from a proposed transmission line would be affected following the construction of the transmission line (Back 2000b). However, the recently published Management Guidelines for Sage Grouse and Sagebrush Ecosystems in Nevada (BLM 2000) singles out transmission lines to be located at least 2 miles from breeding, nesting, brood-rearing, and winter habitat.

In general, habitat fragmentation may be defined as either a reduction of total amount of habitat type or of all natural habitat in a landscape, or the apportionment of remaining habitat into smaller, more isolated

patches. A variety of intrusions have fragmented sage grouse habitat either by physically removing habitat or creating physical or perceived barriers. Agricultural activities, land conversion, roads, reservoirs, mines, fences, and transmission lines may all contribute to habitat fragmentation. A transmission line may fragment habitat by providing a perceived barrier (i.e., a perched raptor or the perception of a perched raptor) and reducing sage grouse security, which in turn, may result in a decline of normal movement in and around leks, brooding, or wintering habitats (Braun 1998). The lines and towers themselves may also provide a physical barrier during times when grouse may fly distances, especially during daily movements between high and low elevations in winter months.

Linear habitat fragmentation is generally associated with roadways that create a more delineated physical barrier. Transmission lines are difficult to compare with road features if they do not permanently remove vegetation, or provide a frequent travel corridor for humans and predators. Because of this, habitat fragmentation as a result of a transmission line may be difficult to qualify or quantify. Perch deterrents, if effective, may mitigate impacts as a result of a perched raptor, but may not mitigate the perceived potential harassment of a raptor. As discussed above, topography plays a significant role in whether perceived predation exists or not. The same may be said for habitat fragmentation. If the transmission line is potentially a barrier to the migratory movements, it would be directly related to the spatial arrangement of the seasonal habitats in relation to the transmission line placement.

Access road improvements are not considered to be a significant impact for the majority of the leks as the roads already exist and they could be restored to their pre-construction condition or closed where necessary per the BLM's direction. However, two leks are immediately adjacent to or within existing access roads that may require improvements. These impacts are discussed under that particular segment. Material yards are not within suitable habitat; therefore, they are not anticipated to have impacts to sage grouse or their habitat.

Following survey protocol for sage grouse, helicopter surveys revealed locations of 15 active leks in spring 1999 as shown on Table 3.7-7 and Figure 3.7-3.

TABLE 3.7-7: ACTIVE LEKS SIGHTED ALONG THE STUDY CORRIDOR (SPRING 1999 DATA)

Number of Active Leks	General Location	Segments
3	Located 1 mile or less from the centerline	F, B, E
5	Located 1-2 miles from the centerline	C, B, E
1	Located 2-3 miles from the centerline	G
6	Located 3-5 miles from the centerline	C, D, J
Total = 15		

Source: SEI 2000

Following survey protocol for sage grouse, additional helicopter surveys revealed locations of 12 active leks in spring 2000 as shown on Table 3.7-8 and Figure 3.7-3. In total, 13 active leks may be accounted for the spring 2000 data.

TABLE 3.7-8: ACTIVE LEKS SIGHTED ALONG THE STUDY CORRIDOR (SPRING 2000 DATA)

Number of Active Leks	General Location	Segments
6	Located 1 mile or less from the centerline	B, E
6	Located 1-2 miles from the centerline	B, C, E, F, G
1	Located 2-4 miles from the centerline	J
Total = 13		

Source: SEI 2000

❑ ***Impact Special Status Species-7: Impacts to Sage Grouse***

Potential impacts to sage grouse that may result from the construction of the transmission line include: disturbance to sage grouse breeding and brooding ranges, winter range, and summer range from construction, operation, and maintenance; increased predation and/or harrassment of sage grouse from birds of prey perching on the transmission line towers; and habitat abandonment due to sage grouse reaction to potentially intimidating visual effects of the line. The following mitigation measures may be used to help minimize these impacts.

❑ ***Mitigation Measure Special Status Species-7a (Disturbance to Active Leks)***

Pre-construction and construction activities near the active lek areas identified during the spring 1999, 2000, and subsequent survey within 2 miles of the study corridor would be avoided using a 2-mile radius around each active lek from March 1 through May 15 (BLM 1984). However, NDOW or BLM may allow particular activities within 0.5-mile avoidance radius (e.g. archaeological testing, survey staking, and environmental surveys). Activities within 2 miles of active leks should not take place 2 hours before dawn until 10:00 a.m. during those dates near active leks (BLM 1984). Restrictions for construction could be canceled, with appropriate resource agency (BLM, NDOW) concurrence, if pre-construction biological surveys indicate leks are inactive or are adequately screened by intervening topography/aspect (FERC 1995).

❑ ***Mitigation Measure Special Status Species-7b (Perch Deterrents Along Sage Grouse Habitat)***

SPPC will incorporate perch-deterrent design features for all transmission towers and place these devices on the crossarms of the transmission structures located within 2 miles of active leks and within nesting, brood-rearing, and wintering habitat to discourage raptor and corvid perching. The nesting, brood-rearing, and wintering habitat areas will be based on BLM and NDOW documented habitat maps and field surveys completed by biologists qualified to identify the different types of habitat. Final boundaries of sage grouse habitats will be approved by the BLM and NDOW. Perch deterrents will not be required in areas that cannot be perch protected (utility corridor along Segments I and J), instead, off-site mitigation will be required (see Mitigation Measure- 7c below). This mitigation would include annual maintenance level inspections to ensure that the devices are still in place and functioning.

❑ ***Mitigation Measure Special Status Species –7c (Off-site mitigation for Sage Grouse)***

In areas that cannot be perch-protected (utility corridor along Segments I and J), off-site mitigation of retrofitting other lines selected by BLM or NDOW with either perch deterrents or flight diverters is recommended. Mitigation values would be determined using the following: miles of historic lek intercept of the 2-mile radius multiplied by average number of towers per mile would equal the number of towers to be retrofitted off-site (i.e. 28 miles of intercept X 4 towers/mile = 112 structures). In the case of retrofitting off-site lines with flight diverters, the multiplier would equal $2,000/tower for funding the placement of bird flight diverters.

Should historic leks become active or new leks become established within line-of-sight of the towers along Segment J, the BLM would approach SPPC about installing perch deterrents on the subject structures owned by SPPC. Funds available from the mitigation account would be used; otherwise, other SPPC company funds may be available to install perch deterrents on a case-by-case basis.

❑ ***Mitigation Measure Special Status Species –7d (Monitoring)***

To address the potential visual impact of a transmission line, SPPC would implement monitoring of leks along the selected transmission line route, out to three miles, with an equal number of selected leks outside of the sphere of influence (control leks). This type of study can help determine whether residual visual impacts of a transmission line remain after raptor and raven perching is mitigated. (This assumes that anti-perching measures are effective.)

This study would involve counting the number of sage grouse at leks. This data collection effort can be coordinated with other BLM and NDOW efforts. Monitoring would continue for a minimum of 10 years. Monitoring could extend beyond 10 years until consistent data reveals conclusions. If extended monitoring does not reveal conclusions, monitoring should not exceed 12 years.

The data collected would be prepared in a yearly report by SPPC and findings presented to the BLM and NDOW to include in their own monitoring database. Once the monitoring effort is concluded, SPPC could prepare a final report compiling all of the data for possible submission to a selected journal. The trend leks, agency coordination, monitoring protocols, and all other final issues will be defined in the COM Plan.

Ferruginous Hawks: Table 3.7-9 lists the ferruginous hawk nests identified during the spring 1999 survey. No significant adverse effects are expected to ferruginous hawks from electrocution or bird collisions as a result of the proposed transmission line. Studies have shown that electrocution and direct collisions of ferruginous hawks with transmission lines have not represented a significant mortality factor (Olendorff 1993). Although transmission lines along existing roads have increased the susceptibility of ferruginous hawks to shooting, this impact has been documented as minimal (Olendorff 1993).

TABLE 3.7-9: FERRUGINOUS HAWK NESTS SIGHTED ALONG THE STUDY CORRIDOR (SPRING 1999 DATA)

Number of Nests	Status and General Location of Nest	Segment
7	Occupied nests within 1 mile of the centerline	E, H
2	Occupied nests within 1-2 miles of the centerline	H, I
6	Probable occupied nests within 1 mile of the centerline	B, F, G, K
14	Inactive nests within 1 mile of the centerline	E, H, I
14	Inactive nests within 1-2 miles of the centerline	E, I
Total = 40		

Source: SEI 2000

Habitat fragmentation, as discussed under sage grouse, is a concern to all special-status species. For ferruginous hawks, potential habitat fragmentation may result from new roadways, which could potentially introduce a greater human presence in the landscape. There are numerous existing roads within the occupied hawk territories within the study corridor, indicating the hawks' potential tolerance to occasional activities. Twenty-six of the 40 documented ferruginous hawk nests have one or more roads

within 0.5 mile of the nests. Of these 26, 20 have roads within 0.25 mile. SPPC has committed to restoration, where necessary, of any improved access roads and the reclamation of the centerline path; therefore, new access roads would not result from this project.

❑ ***Impact Special-Status Species-9: Impact to Ferruginous Hawk Nests***

Significant adverse effects could occur to nesting ferruginous hawks from implementation of the project. Ferruginous hawks are highly vulnerable to human disturbance near their nesting sites, particularly during courtship and incubation periods (Olendorff 1993). Nest abandonment as a result of these disturbances is common. Due to the proximity of the identified nests to the study corridor (e.g., in Segment B), construction and maintenance activities could result in nest and territory abandonment. Because ferruginous hawks use alternate nest sites and sometimes rotate amongst these sites over a period of several years, all nest locations are considered as suitable nesting habitat (Herron et al. 1985, Snyder and Snyder 1991). All nests located in the study corridor could be indirectly affected by noise from construction and maintenance activities, increased traffic, and increased human harassment as a result of increased human access to or increased visibility of the nests. During construction activities, displacement of prey species utilized by ferruginous hawks may occur within the 500-foot study corridor during the nesting season and could preclude birds from foraging near those sites. However, the loss of potential foraging habitat would not be considered a significant impact because of the availability of prey in adjacent lands.

❑ ***Mitigation Measure Special-Status Species-9***

SPPC would avoid any construction activities including access road improvements within a 0.5-mile radius from occupied ferruginous hawk nests during the nesting season, from March 15 through July 1 (BLM 1992). This spatial buffer zone during the nesting season represents the minimum area surrounding a nest that must be kept free of human intrusion to avoid harassment (Olendorff 1993). Avoidance of the early nesting period is critical because ferruginous hawks tend to abandon their nest if they are harassed (Olendorff 1993). Once the eggs have hatched, the adults are less likely to leave their nest (personal communication with Paul Grindrod, Hawk Watch International, May 2000). Trees containing ferruginous hawk nests would be avoided during construction activities. Ferruginous hawks would be allowed to initiate and complete their breeding activities at any potentially impacted nest (Olendorff 1993).

Ferruginous hawk nesting territories, as identified by NDOW, do not always contain hawk nests. Therefore, pre-construction surveys would be necessary along these identified territories. To avoid disturbance to previously undocumented ferruginous hawk nests, a qualified biologist, acceptable to NDOW and BLM, would conduct pre-construction surveys in identified nesting territories along the proposed line. If newly identified ferruginous hawk nests are found along the route alternative, SPPC would avoid any construction activities within a 0.5-mile radius from any ferruginous hawk nest during the nesting season, from March 15 through July 1 (BLM 1992). Occupied, inactive, or potentially occupied ferruginous hawk nests would not be removed during construction activities.

Road improvements associated with this project and the centerline travel route within 0.5 mile of ferruginous hawk nest would be reclaimed as outlined in Appendix E, Reclamation Plan and Section 3.4, Vegetation, Mitigation Measure Vegetaton-4. Existing roads may need to be reclaimed within the 0.5 mile sphere as deemed necessary by BLM or NDOW as outlined in Section 3.6, Wildlife and Wildlife Habitat, Mitigation Measure Wildlife-4. No reclamation activities may occur during the hawks' nesting season, as stated above.

Potential mitigation measures for the increased access to ferruginous hawk nests would include revegetation of maintenance roads by SPPC after construction of the transmission line (refer to

Section 3.4, Vegetation). Maintenance roads would be revegetated in a way that would not make them susceptible to human intrusion as described in Mitigation Measure Wildlife-4 (mitigation for indirect impacts on wildlife from increased human presence and access, see Section 3.6). SPPC would avoid routine maintenance activities during the nesting season, from March 15 through July 1 (BLM 1992) near the two highly concentrated nest areas (Segments E and H).

Special-Status Bats: If individual special-status bats are present along the route alternatives, these individuals could be impacted. Potential roosting habitat is present in areas where rock outcrops occur, in particular at Hercules Gap (along Segment J, which is common to all route alternatives) and along the K re-route.

❑ ***Impact Special-Status Species-10: Impact to Roosting Bats***

According to bat biologist Rick Sherwin of the University of New Mexico (personal communication, July 19, 2000), assessing potential impacts to species that may roost anywhere is difficult to quantify given the difficulty of locating these species. The project does not recommend placing towers on cliff faces or on top of outcrops, nor does the project propose to change those features in any way. However, the K re-route passes directly over a rock outcrop, and some blasting or drilling might occur near the rock outcrop at Hercules Gap on Segment J (Ruth Quad).

❑ ***Mitigation Measure Special-Status Species-10***

To avoid disturbance to roosting bats that may occur in the project area, a qualified biologist, acceptable to NDOW and BLM, would conduct pre-construction surveys near the rock outcrops using night-vision goggles or binoculars. If roosting bats are detected at the site, no blasting or drilling activities would occur during maternity time, from June through August. If roosting bats are not present, construction activities may resume per BLM or NDOW's direction.

❑ ***Impact Special-Status Species-11: Contractor Compliance with Environmental Issues***

Without proper training, contractors or their crews may not generally take special-status species and unique habitats into consideration during construction activities. So that mitigation measures detailed in this section and other sections may be understood and be followed more readily, the following mitigation measure is recommended.

❑ ***Mitigation Measure Special-Status Species-11***

SPPC will conduct a Biological Resource Education Program for construction supervisors, managers, general foremen, and foremen and enforce construction restrictions before and during construction. Due to the high turnover rate associated with construction crews, general foremen and foremen will be required to keep track of and require training of all construction personnel under their supervision of the special-status species and other sensitive resources that may exist and their protection under the Endangered Species Act of 1973 (16 USC 1536). All educational programs will be conducted before construction personnel are allowed to work on the project. SPPC recommends a multi-hour environmental education and training session for foremen and above, and a less than one-hour training for the workers on the construction crews. This places the knowledge and responsibility with the leadership, and would require them to keep track of and train new project personnel under their supervision.) The program would also cover mitigation measures, environmental permits, and proposed project plans, such as a reclamation plan. SPPC and their environmental compliance inspector(s) would be responsible for ensuring that crew members adhere to the guidelines and restrictions. Additional education programs would be conducted as needed to inform appropriate new personnel brought on the job during the construction period.

Alternative-Specific Impacts

In addition to impacts common to route alternatives (as described above), the following sections address impacts that would be associated with specific route alternatives. Because each of the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

To assist the reader in understanding the spatial distribution of special-status species in the project area, Table 3.7-10 presents data for species occurrence by segment. As shown in the table, most segments include occurrences of two or three special-status species. Segment B includes the most, with five occurrences; there were no observations in Segment A. Also evident is that some species (e.g., Swainson's hawk, golden eagle, and pygmy rabbit) occur in only two segments, whereas other species (such as the sage grouse and ferruginous hawk) occur in most of the segments. Of particular interest, however, is that when segments are grouped by alternative, most of the route alternatives include observations of all of the nine special-status species discussed above (Table 3.7-11). The only exceptions are the Pine Valley route alternatives (which do not include golden eagle occurrences), and the Buck Mountain route alternative (which does not include Swainson's hawk or northern goshawk observations).

TABLE 3.7-10: SUMMARY OF SPECIES OCCURRENCE BY SEGMENT

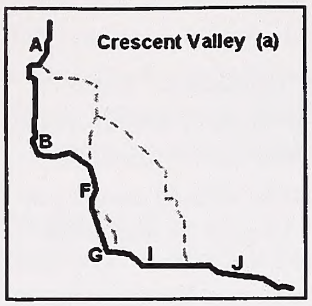
Species	Segment or Re-Route											
	A	B	C	D	E	F	G	H	I	J	K	L
Swainson's Hawk		X		X								
Golden Eagle		X			X							
Pygmy Rabbit					X					X		
Bat sp.										X	X	
Bald Eagle					X			X	X			
Northern Goshawk						X						
Sage Grouse		X	X	X	X	X	X	X	X	X		X
Burrowing Owl		X	X	X								X
Ferruginous Hawk		X			X		X	X	X			

TABLE 3.7-11: SUMMARY OF SPECIES OCCURRENCE BY ROUTE ALTERNATIVE

Route Alternative	Swainson's Hawk	Golden Eagle	Pygmy Rabbit	Bat sp.	Bald Eagle	Northern Goshawk	Sage Grouse	Burrowing Owl	Ferruginous Hawk
Crescent Valley (a)	X	X	X	X	X	X	X	X	X
Crescent Valley (b)	X	X	X	X	X	X	X	X	X
Pine Valley (a)	X		X	X	X	X	X	X	X
Pine Valley (b)	X		X	X	X	X	X	X	X
Buck Mountain		X	X	X	X		X	X	X

Note that no significant impacts to special-status wildlife are expected along Segment A, because no active or historic sage grouse leks, nor special-status species nests or burrows, nor ferruginous hawk nesting territory were identified along this segment.

Crescent Valley (a) Route Alternative



Crescent Valley (a) includes Segments A, B, F, G, I, and J, as well as the K and L re-routes, which could be used to realign portions of Segment B around sensitive resources. All of the 9 special-status species identified under impacts common to alternatives potentially occur in Crescent Valley (a). Site-specific species occurrence and potential impacts are listed below by segment.

Segment B

Segment B includes potential habitat and documented species occurrence of Swainson's hawks, golden eagles, sage grouse, burrowing owls, and ferruginous hawks. As a large colony of burrowing owls was identified within 2.25 miles of Segment B, Mitigation Measure Special-Status Species-3 would apply.

Although Swainson's hawk nests were not found during the wildlife surveys, nesting in the study corridor is a possibility (SEI 2000). A single bird hunting from a perch on the ground in Segment B (Pete Hanson Creek Quad), less than 1.5 miles north of the centerline, was observed during field surveys, and another Swainson's was noted flying in the same area. Should Swainson's hawks be found nesting within one mile of Segment B then Mitigation Measure Special-Status Species-2 would apply.

One of the 3 golden eagle nests identified in the project area is located near Segment B – an inactive nest in a rock outcrop within one mile of the study corridor. To protect this nest from potential project-related impacts, if it becomes occupied, Mitigation Measure Special-Status Species-4 would apply.

Two potentially occupied ferruginous hawk nests were identified along Segment B and mapped within 1-2 miles of the centerline during the field surveys. Ferruginous hawks were identified in the west- and-east facing slopes of the southern end of the Cortez Mountains along Segment B, within 1 to 2 miles of the proposed centerline. At least one of these two ferruginous hawk nests could be removed during tree removal and trimming for the required line clearance and overland travel performed within the study corridor. To protect these potential nest locations from potential project-related impacts, should they become occupied, Mitigation Measure Special-Status Species-9 would apply.

Three active leks within 1 to 2 miles were identified along Segment B during the 1999 and 2000 surveys. However, the 2000 surveys indicated that the 1999 fires altered the habitat around the three leks located in 1999. In this area, only two leks were observed in 2000. A single male was sighted at Lek 17 but was not seen on a subsequent visit (Back 2000a). In addition, at least 7 historic leks were identified within 2 miles of Segment B. The BLM considers historic leks as potential suitable habitat (personal communication with Stamm, BLM, July 31, 2000).

However, some habitat characteristics are missing from historical leks (i.e., overgrown sagebrush, existing roads nearby). Therefore, these historic leks have not been active during at least the past 2 years. Impacts to active leks along Segment B would be considered significant and impacts to historic leks would be considered adverse, but could be mitigated by implementing the mitigation measures outlined under Mitigation Measure Special-Status Species-8b. Lek 17 is much higher in elevation than the proposed transmission line along Segment B. It is not likely that this location would create an advantage for raptors (Back 2000a).

Additionally, some of the active leks located along Segment B are situated within one of the wildfires of 1999 (Figure 3.4-1). The habitat surrounding these active leks (1999 - 6, 7, and 8) would require vegetative succession to return to suitable nesting and brooding habitat. Leks 14 and 15 (2000) were

likely established because of the fire. Lek 15 is likely to be abandoned due to lack of suitable strutting and nesting habitat (Back 2000a).

Habitat fragmentation for migratory movements of sage grouse could occur along Segment B. Lek 17 might be impacted during winter movements when the grouse may move from higher elevations to lower elevations. Leks 14, 8, and 7, however, are less likely to have increased impacts as the heavily traveled Cortez Beowawe Road that runs east to west from Garden Valley to Grass Valley may already constitute fragmented habitat due to traffic loads and potential predator travel corridor. Lek 15 may be impacted during winter seasonal movements.

Access roads would not likely constitute a significant impact to these leks. The access roads are well established and heavily used roads. One exception is a two-track, located 0.5 mile from lek 6. Due to existing roads and lek locations, habitat fragmentation as a result of this project would not be considered a significant impact.

To mitigate potential impacts to the historic and active leks identified along Segment B and documented sage grouse seasonal habitat, Mitigation Measure Special-Status Species-7b, -8a, and –8b would apply.

Segment B could be realigned to incorporate the K and L re-routes to avoid sensitive resources identified during the field surveys. Both sage grouse and burrowing owls potentially occur in the L re-route. However, the K re-route contains potential habitat for bat species. Some blasting or drilling might occur along the K re-route (Cortez Canyon Quad), which traverses near and over numerous large rock outcrops in pinyon-juniper habitat. Such activities could disturb roosting bats. In particular, the K re-route is the only portion that passes directly over a rock outcrop; other portions of the study area may pass within one mile but do not traverse outcrops. To reduce potential impacts to roosting bats (as described under Impact Special-Status Species-10), SPPC would implement the Mitigation Measure Special-Status Species-10. Note, however, that the potential presence of bat species along the K re-route makes it less feasible compared to the L re-route.

Two burrowing owl burrows were identified on the L re-route. The existing Mule Canyon Road is heavily traveled by both Mule Canyon Mine employees in personal vehicles and by haul trucks. Therefore, any increase in traffic on the road due to construction of the project is short-term and is unlikely to adversely affect the burrowing owls. No mitigation measures would be necessary.

Sage grouse also occur on the L re-route; one active lek was identified within 2 miles of the L re-route during the 1999 and 2000 surveys. No historic leks were identified within 2 miles of the re-route. Impacts to the active lek and documented seasonal habitat along the L re-route would be considered significant but could be mitigated to a less-than-significant level by implementing the Mitigation Measures Special-Status Species-7b, -8a, and –8b, described earlier.

Segment F

Segment F, which is shared by the four Crescent Valley and Pine Valley route alternatives, includes potential habitat or documented species occurrence of both the sage grouse and northern goshawk. The only northern goshawk observed in the project area was sited in Segment F, less than 0.25 mile west of the centerline near a spring (in the Garden Pass Quad); as described earlier, the project area does not provide suitable habitat for this species, and the observed bird was likely a fly-over. No significant impacts to the northern goshawk are anticipated, and no mitigation measures are necessary.

Two active leks were identified within one mile of Segment F during the 1999 and 2000 surveys. However, Lek 18 was not visible from Segment F due to its location on a slope facing away from the transmission line, and Lek 5 is located on a bench above the transmission line corridor and may not be visible from the transmission line. It is not likely that this would create an advantage for raptors (Back

2000a). Therefore, no significant impacts are expected to Leks 5 and 18, which are active. Two were identified within 2 miles of Segment F. However, Mitigation Measure Special-Status-8b (Perch Deterrents) would be implemented throughout documented seasonal sage grouse habitat. Proposed access roads are located 0.7 mile and one mile, respectively, from the leks. Significant impacts resulting from construction-related road activity could occur but could be mitigated to a less-than-significant level by implementing Mitigation Measure Special-Status Species-8a.

Segment G

Segment G, which is part of both Crescent Valley (a) and Pine Valley (a), includes documented occurrences of two special-status species – sage grouse and the ferruginous hawk.

One active lek was identified 2.2 miles of Segment G during the 1999 and 2000 surveys. Impacts to sage grouse or their habitat may occur; therefore, implementing Mitigation Measure Special-Status Species-8b would lessen these impacts.

One potentially occupied ferruginous hawk nest could be affected during tree removal and trimming for the required line clearance and overland travel performed within the 500-foot study corridor. Due to the proximity of the identified nest to Segment G, construction and maintenance activities could result in nest and territory abandonment. The nest could be indirectly affected by noise from construction and maintenance activities, increased traffic, and increased human harassment as a result of increased human access to or increased visibility of the nests (see Impact Special-Status Species-9). These impacts would be reduced to a less-than-significant level by implementing Mitigation Measure Special-Status Species-9.

Segment I

Segment I, shared by the four Crescent Valley and Pine Valley route alternatives, includes documented occurrences of the sage grouse and ferruginous hawk; bald eagles may also occur in the vicinity.

No active leks were identified along Segment I during the 1999 and 2000 surveys (Back 2000a). Therefore, no significant impacts to currently active sage grouse leks are expected along Segment I. At least 8 historic leks were identified within 2 miles of Segment I. Impacts to these historic leks along Segment I would be considered adverse, but could be mitigated to a less-than-significant level by implementing Mitigation Measure Special-Status Species-7a, discussed above under impacts common to all route alternatives.

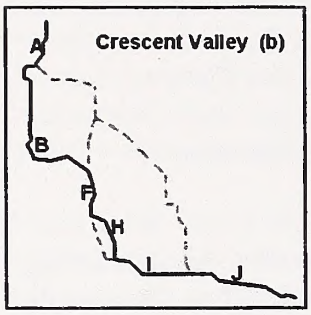
Should historic leks become active or new leks become established within line-of-sight of the towers along Segment I, SPPC would be required to retrofit towers with perch deterrents that are within line-of-sight of the active lek (similar to what is proposed for Segment J, as described in the second paragraph of Mitigation Measure Special-Status Species-8b). The BLM recognizes that the effectiveness of the deterrents would be based on whether the existing 230 kV line could be retrofitted with perch deterrents.

Three ferruginous hawk nests, both occupied and inactive, were identified and mapped within 2 miles of Segment I during the field surveys. Significant adverse effects could occur to nesting ferruginous hawks from implementation of the project; general construction activities, noise, and blasting may adversely affect some of these nests. This species is vulnerable to increased activities near their nesting sites (Olendorff 1993), as described under Impact Special-Status Species-9. Such impacts would be mitigated to a less-than-significant level by implementing Mitigation Measure Special-Status Species-9, discussed above under impacts common to route alternatives.

Wintering bald eagles potentially occur in the vicinity of Segment I; according to NDOW (Herron et al. 1985), the study corridor traverses traditional wintering areas along the western edge of Diamond Valley. As described under Impact Special-Status Species-6, the study corridor falls on the edge of the mapped

areas and adverse impacts to wintering bald eagles are not anticipated; no mitigation is required. Neither bald eagles nor potential roost sites were located in the study corridor during the surveys.

Crescent Valley (b) Route Alternative



The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J (and possibly the K and L re-routes). It follows a nearly identical alignment with the Crescent Valley (a) route, except that it uses Segment H rather than Segment G, traversing the east side of Whistler Mountain rather than the west. The Crescent Valley (b) route shares the impacts common to route alternatives (i.e., Impact Special-Status Species-1 through -11) and the impacts associated with Crescent Valley (a) route, except it would avoid impacts associated with Segment G, as described above. Impacts associated with Segment H are described below.

Segment H

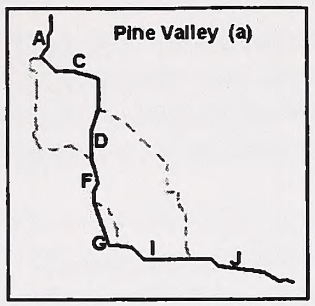
Segment H, which is shared by Crescent Valley (b) and Pine Valley (b), includes occurrences of the sage grouse and ferruginous hawk; in addition, bald eagles may occur in the vicinity.

No active leks were identified along Segment H during the 1999 and 2000 surveys (Back 2000a). Therefore, no significant impacts to currently active sage grouse leks are expected along Segment H. At least four historic leks were identified within 2 miles of Segment H. Impacts to documented sage grouse seasonal habitat would be considered adverse but could be mitigated by implementing Mitigation Measure Special-Status Species-8B.

Large concentrations of ferruginous hawks were identified in the east-facing slope of the Whistler Mountains near Segment H within 2 miles of the proposed centerline. At least 11 ferruginous hawk nests, including occupied, inactive, and potentially occupied nests, were identified and mapped within 2 miles of Segment H during the field surveys. These nests are located in one of the two largest ferruginous hawk nesting territory areas identified by NDOW resource staff. Of these 11 nests, at least two could be removed during tree removal and trimming for the required line clearance and overland travel performed within the 500-foot study corridor. The rest of the nests located along Segment H would be indirectly affected. As described under Impact Special-Status Species-9, ferruginous hawks are highly vulnerable to human disturbance near their nesting sites. In addition, all nests located in the study corridor could be indirectly affected by noise from construction and maintenance activities, increased traffic, and increased human harassment as a result of increased human access to or increased visibility of the nests. Adverse impacts to occupied ferruginous hawk nests would be avoided by implementing Mitigation Measure Special-Status Species-9.

Wintering bald eagles potentially occur in the vicinity of Segment H; according to NDOW (Herron et al. 1985), the study corridor traverses traditional wintering areas along the western edge of Diamond Valley near the base of Whistler Mountain. As described under Impact Special-Status Species-6, the study corridor falls on the edge of the mapped areas and adverse impacts to wintering bald eagles are not anticipated; no mitigation is required. Neither bald eagles nor potential roost sites were located in the study corridor during the surveys.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B. In addition to the impacts common to all route alternatives described previously (i.e., Impact Special-Status Species-1 through -11), the Pine Valley (a) route would involve impacts described above for Segments A, F, G, I, and J. Impacts associated with Segments C and D are described below.

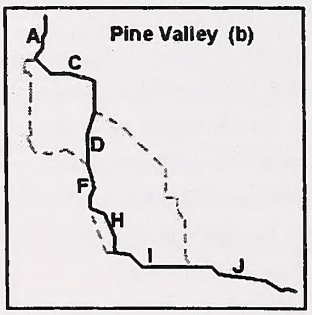
Note that there are no documented observations of the golden eagles or nests in either of the Pine Valley route alternative study corridors.

Segment C

Segment C, which is shared by both Pine Valley route alternatives as well as Buck Mountain, includes occurrences of the sage grouse and burrowing owl. Four burrowing owl burrows were identified within one mile of Segment C. Potential impacts to burrowing owls and their burrows are described above under Impact Special-Status Species-3. Impacts would be mitigated to a less-than-significant level by implementing Mitigation Measure Special-Status Species-3.

Seven active leks within 1 to 5 miles of the centerline were identified along Segment C during the 1999 and 2000 surveys. However, leks 1 and 16 along Segment C would not be visible from the location and approximate height of the transmission support structures due to topographic features. It is not likely that this would create an advantage for raptors (Back 2000a). Potential habitat fragmentation is more likely for these two leks but should be considered for all the leks along Segment C. The transmission line would be aligned so that seasonal habitats, specifically winter habitats, are substantially bisected. Highway 278 lies over 3 miles to the east beyond the proposed transmission line, and few other roads are located in the area. Leks 2, 3, 4, 11, and 12 are located more than 3 miles away from Segment C; therefore, no significant impacts are expected to affect these active leks. Proposed access roads are not anticipated to significantly impact these leks. Access roads are located from approximately 2.25 miles to over 4 miles from the leks. One historic lek was located within 2 miles of Segment C. Impacts to the historic lek would be considered adverse, but could be mitigated by implementing Mitigation Measure Special-Status Species-7. Potential impacts to active leks would be mitigated by implementing Mitigation Measure Special-Status Species-8.

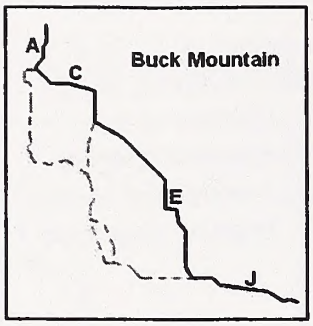
Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west. The Pine Valley (b) route alternative would have largely the same impacts as Pine Valley (a) route, except for the effects identified above for Segment G. In addition, it would include the impacts associated with Segment H, as discussed above for the Crescent Valley (b) route alternative.

Note that there were no documented observations of the golden eagles or nests in the Pine Valley (b) route alternative study corridor.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. It shares the impacts common to route alternatives (i.e., Impact Special-Status Species-1 through -11), as well as the impacts associated with Segment C (as described above for Pine Valley (a)). Buck Mountain is the only route that uses Segment E, as described below.

Note that Buck Mountain is the only route alternative where the Swainson's hawk and northern goshawk were not observed or documented.

Segment E

Segment E includes observations of the golden eagle, pygmy rabbit, bald eagle, sage grouse, and ferruginous hawk. Two occupied golden eagle nests were identified within one mile of Segment E during the field surveys. Golden eagles may be displaced and abandon their nests as a result of construction activities along the study corridor. This impact is considered significant but could be mitigated to a less-than-significant level by implementing Mitigation Measure Special-Status Species-4, as discussed under impacts common to route alternatives.

In total, four active sage grouse leks within 1 to 2 miles were identified along Segment E during the 1999 and 2000 surveys. The presence of the transmission line could potentially fragment habitat. Fewer roads are found in this area and the transmission line is located equidistant from seasonal habitats. Movement to summer habitat may impact Lek 9 more significantly than the other leks. Existing access roads that could be used during construction range from hosting an active lek to being 0.75 mile from an active lek. Leks 13 and 14 are either located within a roadway or directly adjacent to a roadway. These two leks could potentially receive unmitigable impacts if any access road improvements occur. In addition, at least 4 historic leks were identified within 2 miles of Segment E. Potential impacts to documented sage grouse seasonal habitat may be lessened by implementing the Mitigation Measure Special-Status Species-8B. Impacts to active leks along Segment E would be considered significant, but could be mitigated to less than significant by implementing the mitigation measure below.

❑ ***Mitigation Measure Special-Status Species-8c***

Significant impacts to Leks 13 and 14 may be mitigated by using different access roads or by not improving the roadways. For additional mitigation, see Mitigation Measure Special-Status Species-8a and –8b.

Large concentrations of ferruginous hawks were identified in the west-facing slopes of the White Pine Range and Dry Mountain along Segment E within 2 miles of the proposed centerline. At least 19 ferruginous hawk nests, including active and inactive nests, were identified and mapped within 2 miles of Segment E during the field surveys. These nests are located in one of the two largest ferruginous hawk nesting territory areas identified by NDOW resource staff. Of these 19 ferruginous hawk nests, at least seven could be removed during tree removal and trimming for the required line clearance and overland travel performed within the study corridor. The rest of the nests located along Segment E would be indirectly affected. As described under Impact Special-Status Species-9, ferruginous hawks are highly vulnerable to human disturbance near their nesting sites. In addition, all nests located in the study corridor could be indirectly affected by noise from construction and maintenance activities, increased traffic, and increased human harassment as a result of increased human access to or increased visibility of the nests. Adverse impacts to occupied ferruginous hawk nests would be avoided by implementing Mitigation Measure Special-Status Species-9.

Segment E is one of the two segments with documented pygmy rabbit burrows. The one pygmy rabbit burrow along Segment E was identified within one mile of the centerline. Potential impacts to the

rabbits in those burrows could occur as a result of increased human activities along the study corridor, as described under Impact Special-Status Species-5. Although the identified pygmy rabbit burrow is located far away (i.e., within one mile from the centerline), it could be adversely impacted from increased traffic during construction. Impacts to pygmy rabbits and their burrows would be reduced to a less-than-significant level by implementing Mitigation Measure Special-Status Species-5, described under impacts common to route alternatives.

Wintering bald eagles potentially occur in the vicinity of Segment E; according to NDOW (Herron et al. 1985), the study corridor traverses traditional wintering areas along the northernmost reaches of Diamond Valley for approximately 3 miles (Sadler Basin and Garcia Flat Quads). In Newark Valley, which encompasses Newark Lake, the study corridor traverses mapped habitat north of Buck Pass for approximately 7 miles (Mooney Basin Summit and Cold Creek Ranch Quads). As described under Impact Special-Status Species-6, the study corridor falls on the edge of the mapped areas and adverse impacts to wintering bald eagles are not anticipated; no mitigation is required. Neither bald eagles nor potential roost sites were located in the study corridor during the surveys.

Summary Comparison of Route Alternatives

TABLE 3.7-12: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Special-Status Species-1: Possible Disturbance of Special-Status Plants	X	X	X	X	X
Impact Special-Status Species-2: Potential Impacts to Swainson's Hawks	X	X	X	X	
Impact Special-Status Species-3: Impact to Burrowing Owl Burrows	X	X	X	X	X
Impact Special-Status Species-4: Impact to Golden Eagle Nests	X	X			X
Impact Special-Status Species-5: Impact to Pygmy Rabbit Burrows	X	X	X	X	X
Impact Special-Status Species-6: Potential Impact to Bald Eagles	X	X	X	X	X
Impact Special-Status Species-7: General Impacts to Sage Grouse	X	X	X	X	X
Impact Special-Status Species-8: Impact to Active Sage Grouse Leks	X	X	X	X	X
Impact Special-Status Species-9: Impact to Ferruginous Hawk Nests	X	X	X	X	X
Impact Special-Status Species-10: Impact to Roosting Bats	X	X	X	X	X
Impact Special-Status Species-11: Contractor Compliance with Environmental Issues	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation residual impacts would be minor. However, as with wildlife and wildlife habitat discussed in Section 3.6, residual effects to special-status species and their habitat would result from temporary habitat loss, displacement of wildlife, and habitat fragmentation. After restoration, these impacts would minimal. Based on existing conditions (such as number of road crossings, active mining

claims, and private property), habitat fragmentation could potentially occur on Segments C, E, and G. Even after mitigation, the potential for habitat fragmentation does exist in landscapes that do not currently have numerous roads or other land-based activities, such as mines and exploration projects.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to existing special-status species and their habitat associated with this project would not occur. However, special-status species impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

3.8 RANGE RESOURCES - LIVESTOCK GRAZING AND WILD HORSES

3.8.1 AREA OF ANALYSIS AND METHODOLOGY

This section addresses range resources, which include livestock grazing and wild horses, in the 500-foot study corridor along the five route alternatives. This section provides a discussion of the livestock grazing areas, kind and class of livestock, and existing grazing management. Wild horses are also addressed through the regulatory framework that protects them, as well as a discussion of Herd Management Areas and consideration of their location along the study corridor.

REGULATORY FRAMEWORK

BLM Standards and Guidelines for Livestock Grazing

The BLM has established Standards and Guidelines by the Secretary of the Interior (43 CFR 4180). The purpose of these Standards and Guidelines is to ensure that the BLM administration of grazing helps preserve currently healthy conditions and restores healthy conditions of rangelands.

BLM Resource Management Plans (RMPs)

In addition, each of the three BLM Resource Management Plans (RMPs) that cover the project area (Shoshone-Eureka, Egan, and Elko) have developed rangeland programs that authorize livestock grazing on public lands (43 CFR 1601.0-5(b) and CFR 4100.08). The regulations require that BLM manage livestock grazing on public lands under the principle of multiple use and sustained yield. To accomplish this, rangeland has been broken down into controllable allotments to manage short- and long-term objectives for livestock grazing. Allotments are leased to permittees for a defined period of time. Allotments are managed to increase availability of forage and develop improvements, and are evaluated periodically to determine whether management goals are being met.

Wild Free-Roaming Horse and Burro Act

The Wild Free-Roaming Horse and Burro Act (the Act) of 1971 (Public Law 92-195) protects wild free-roaming horses and burros from capture, branding, harassment, or death. It also defines their ecological role on federal lands and their historical and cultural value. These populations are to be managed to "achieve a thriving natural ecological balance." The Act was amended by the Federal Land Policy and Management Act of 1976 and the Public Rangelands Improvement Act of 1978 to require the protection, management, and control of wild free-roaming horses and burros on public lands. These acts allow managing agencies to use helicopters to manage and/or remove wild horses deemed to be in excess of what the range can support. They apply to all unbranded and unclaimed horses and burros on public lands administered through the BLM or the Forest Service (43 CFR 4700).

Herd Management Areas (HMAs) have been established, as a requirement of the Act, for the maintenance of wild horse and burro herds. In Nevada, wild horses and burros are found in approximately 100 HMAs. The BLM maintains and manages wild horses and burros in HMAs. Establishment of HMAs must take into consideration the appropriate management level for the herd, the habitat requirements of the animals, and the relationships with other uses of the public and adjacent private lands. An HMA Plan must be prepared by the managing agency. The objective of the management of wild horses and burros is to limit the animals' distribution to the herd areas (43 CFR 4700). A herd is defined as one or more stallions and his mares. The management of these animals is conducted at the minimum feasible level to treat them as wildland species and not as livestock. Management strategies include monitoring, removal of excess animals, preparing animals for adoption, adoption, and compliance (BLM 2000).

Wild horse and burro herds increase at relatively high rates because they lack true natural predators. Populations generally increase at a rate of approximately 18-20% per year. When populations exceed the capacity of their habitat, there is no longer a thriving natural ecological balance. The BLM annually monitors the conditions of these populations and their habitat, and decides if animals need to be removed from their range. In Nevada, they are normally gathered using helicopters. BLM prepares them for adoption through permanent adoption centers. The BLM charges an adoption fee of $125 for each wild horse or burro. Potential adopters need approval from a BLM official (BLM 2000). Nevada has a Wild Horse Management Plan that presents advice and counsel to the Nevada legislature regarding preservation and protection of wild horses, under a multiple-use concept.

3.8.2 AFFECTED ENVIRONMENT

LIVESTOCK GRAZING

The study corridor is open to livestock grazing areas managed by the BLM. All 12 proposed route alternative segments and re-routes cross through allotment areas. Based on grazing allotment maps obtained from the BLM Field Offices, livestock grazing covers nearly 100% of all segments and re-routes. Using a one-mile distance on each side of the centerline, it was determined that the route alternative segments cross 39 grazing allotments, which are administered by the three BLM Field Offices. Thirteen allotments are located within the Elko BLM Field Office management area, 16 are in the Battle Mountain BLM Field Office management area, and 10 are in Ely BLM Field Office management area. Cattle is the predominant livestock type for grazing. Sheep grazing is also a common practice, and horse grazing takes place only in the Elko and Battle Mountain BLM Field Office management areas. Twenty-four permittees exclusively graze cattle, but 12 graze sheep and 5 graze horses in addition to cattle. Two permittees exclusively run sheep on their allotments. Table 3.8-1 lists the livestock grazing allotments, acreage of allotment, kind and class of livestock, active permitted grazing use, and animal unit months (AUMs). Figure 3.8-1 displays grazing allotments as mapped in the GIS by the BLM State Office.

The fires that occurred in 1999 and 2000 are mapped on Figure 3.4-1 and affected some grazing allotments. Grazing allotment management is guided by three RMPs, including Shoshone-Eureka RMP (for Battle Mountain BLM Field Office), Elko RMP, and Egan RMP (for Ely BLM Field Office). Allotments are evaluated periodically to ensure that the management objectives are being reached and that range improvements are made on those allotments with the greatest potential for improvement in resource conditions and return on investment.

Please note that the AUMs in Table 3.8-1 correspond to total AUMs for each allotment. It would be erroneous to assume that these AUMs are evenly distributed within an allotment. This assumption would provide erroneous numbers of AUMs impacted by the transmission line.

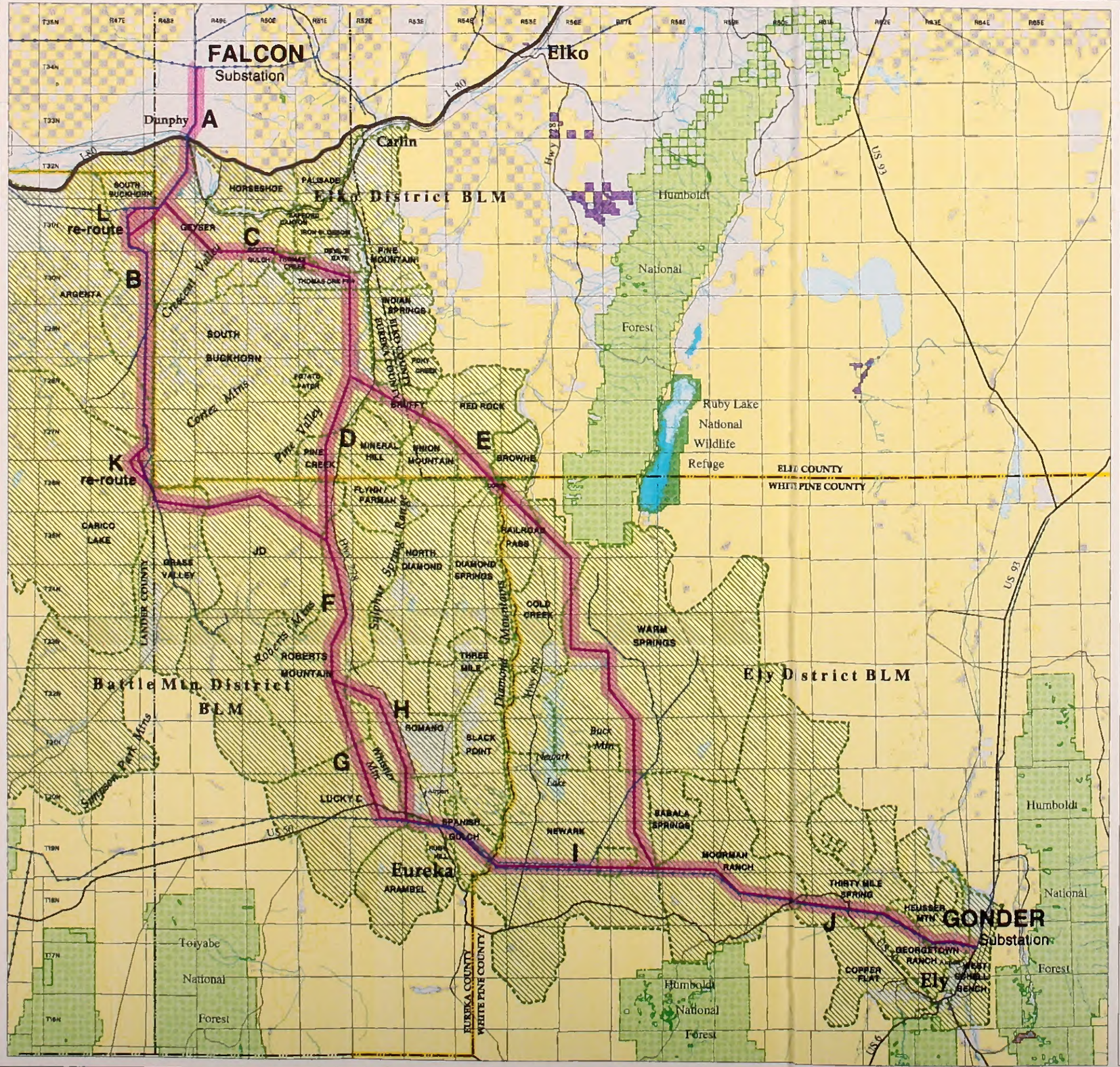
WILD HORSES

Wild horses occur within eight HMAs that are crossed by the study corridor: Diamond Hills North, Diamond Hills South, Diamond, Buck and Bald, Rocky Hills, Roberts Mountain, Whistler Mountain, and Fish Creek. Five additional HMAs are located within 1 to 5 miles of the route alternative segments, but would not be crossed by the transmission line: Cherry Springs (USFS), Butte, Bald Mountain, Monte Cristo, and Jakes Wash. Figure 3.8-2 shows the HMAs located in the vicinity of the project. No burros were observed along the study corridor during the wildlife surveys.

Sierra Pacific Power Co.

FALCON to GONDER Project

Grazing Allotments



TRANSMISSION LINES

- Route Alternatives
- Existing Transmission Lines (60kv or larger)

LAND OWNERSHIP STATUS

- U.S. Forest Service
- U.S. Bureau of Land Management
- U.S. Fish & Wildlife Service
- State Parks & Recreation
- American Indian Reservation
- Private

GRAZING ALLOTMENTS

(named on map)

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

N

GIS Mapping by **EDAW, Inc.** — San Francisco 04/25/01

/usr3/sierrapac/m250graz.aml

SOURCES: US Bureau of Land Management / Stantec Consulting, Inc. (1998) / Nevada —Bureau of Mines & Geology GIS / USGS —DEM

Figure 3.8 - 1

Sierra Pacific Power Co.

FALCON to GONDER Project

Wild Horse Herd Management Areas

TRANSMISSION LINES

- Route Alternatives
- Existing Transmission Lines (60kv or larger)

LAND OWNERSHIP STATUS

- U.S. Forest Service
- U.S. Bureau of Land Management
- U.S. Fish & Wildlife Service
- State Parks & Recreation
- American Indian Reservation
- Private

HERD MANAGEMENT AREAS

- Wild Horse Management Areas
- Horse Free Areas

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco 04/26/01

SOURCES: US Bureau of Land Management / Stantec Consulting, Inc. (1998) / Nevada —Bureau of Mines & Geology GIS / USGS —DEM

Figure 3.8 -2

TABLE 3.8-1: LIVESTOCK GRAZING ALLOTMENTS WITHIN ONE MILE OF THE ROUTE ALTERNATIVE SEGMENTS

Allotment Name	Allotment Number	Kind and Class of Livestock	Acres in Allotment	Total AUMs	Segment
Elko BLM Field Office					
Bruffy	5405	Cattle	18,800	1806	E
Devil's Gate	5412	Cattle	13,926	374	C
Geyser	5423	Cattle	130,089	1227	A,B,C
Horseshoe	1012	Cattle		1630	A*
Iron Blossom	5430	Cattle		1539	C*
Pine Creek	5445	Cattle	16,251	150	D
Pony Creek	5447	Cattle, Horses, and Sheep	16,310	1509	E*
Red Rock	5452	Cattle and Sheep	36,553	7503	E
Safford Canyon	5456	Cattle	9,770	1342	C*
Scotts Gulch	5459	Cattle	22,539	1213	C
South Buckhorn	5465	Cattle and Horses	318,353	20059	B,C,D,E
Thomas Creek	5467	Cattle	6,035	1078	C
Thomas Creek ffr	5483	Cattle	12,610	60	C
Battle Mountain BLM Field Office					
Arambel	10031	Cattle and Sheep		5254	G,I*
Argenta	20001	Cattle, Sheep and Horses	263,654	27212	B
Carico Lake	10003	Cattle, Sheep and Horses	340,951	49586	B
Corta	10033	Sheep	1,428	128	E
Diamond Springs	10035	Cattle		3675	E*
Flynn/Parman Indiv	10039	Cattle		2132	D*
Grass Valley	10006	Cattle, Sheep and Horses	268,935	41514	B
JD	10041	Cattle	158,920	9342	B,D
Lucky C	10043	Cattle	112,451	5081	G,I
North Diamond	10034	Cattle		5279	E*
Roberts Mountain	10046	Cattle and Sheep	167,470	17757	B,D,F,G,H
Romano	10047	Cattle	87,029	2092	F,G,H
Ruby Hill	10048	Cattle and Sheep	15,317	4853	G,H,I
Shannon Station	10051	Cattle	--	--	G,H,I
Spanish Gulch	10054	Cattle and Sheep	40,838	4853	G,H,I
Union Mountain	5473	Cattle	23,637	1759	E
Ely BLM Field Office					
Cold Creek	00603	Cattle	66,466	9129	E
Copper Flat	00427	Cattle and Sheep		3033	J*
Georgetown Ranch	00422	Cattle	27,052	1719	J
Heusser Mountain	00416	Cattle	43,553	1416	J
Moorman Ranch	00802	Cattle	139,272	10099	J
Newark	00608	Cattle and Sheep	254,281	9709	E,J,I
Railroad Pass	00601	Cattle	32,171	3002	E
Thirty Mile Spring	00503	Cattle and Sheep	183,087	8405	J
Warm Springs	00606	Cattle	351,777	23995	E
West Schell Bench	00433	Sheep	45,583	1460	J

-- Shannon Station combined with Spanish Gulch based on available data.

** Allotment not intersected by project centerline but lies within close proximity.*

Wild horse herds are managed according to guidelines provided in the three BLM RMPs previously mentioned:

- Shoshone-Eureka RMP (3,660 wild horses)
- Elko RMP (330 wild horses)
- Egan RMP (1,451 wild horses)

In the summer of 1999, wildfires affected two HMAs within the study corridor. Rocky Hills HMA was affected by the Trail Canyon Fire along Segment B, and Diamond Hills North HMA was affected by the Sadler Fire along Segment E. The Crusoe Fire in 2000 affected the Thirty Mile Spring HMA along Segment J. Drought conditions of 2000 may also affect all HMAs within the study corridor.

3.8.3 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

Project construction and operation activities would have a significant impact on range resources (livestock grazing and wild horses) if they would:

- Result in loss of forage such that it would adversely affect livestock operations and dramatically reduce the number of AUMs available.
- Substantially disrupt livestock movement and migration routes for wild horses.
- Substantially increase human disturbance/harassment to wild horses, burros, or livestock.
- Substantially conflict with the use of existing livestock grazing areas and Herd Management Areas for wild horses.

ENVIRONMENTAL IMPACTS - COMPARISON OF ALTERNATIVES

Impacts Common to All Route Alternatives

The following section describes impacts to range resources that would occur with any of the route alternatives. Increased presence of humans and noise during construction may cause livestock and wild horses to leave the vicinity of the construction areas. Mares may seek alternative foaling sites if the project is near traditional foaling locales. Cattle, sheep, and horses may not be able to access portions of their established grazing areas during construction. These impacts would be temporary and less-than-significant. However, access to water is critical for cattle and wild horses.

❑ ***Impact Range-1: Impact to Available Water Sources***

Project construction activities have the potential to disrupt grazing practices in the project area. Due to the linear nature of the project, the potential to decrease access to available water sources exists. It would be considered an adverse impact if the project prevents animals from accessing water sources. However, the following measure would ensure access to water during construction.

❑ ***Mitigation Measure Range-1***

If BLM range resource managers determine that construction would block livestock access to critical water sources, SPPC would provide alternative water sources away from the construction activities.

❑ ***Impact Range-2: Impact to Range Improvements***

Range improvements such as fences and gates may be found on both private and BLM lands. In areas where these improvements exist, sections may need to be removed or opened to accommodate construction traffic. Open fences and gates may allow livestock to leave allotments and trespass on other lands, become lost, or potentially be struck by vehicles. Although this is not considered significant, mitigation is recommended. To reduce potential issues of trespassing livestock due to the removal of fences or gates, the following measure will be implemented.

❑ ***Mitigation Measure Range-2***

BLM range resource managers would coordinate with SPPC and permittees to locate range improvements that might require special attention. These could be areas that are actively being grazed which may require immediate attention when fencing or gates are removed. SPPC would ensure that all temporary openings have barriers across them to prevent movement of livestock through the openings. Gates that do not require removal would be closed directly after construction traffic accesses the construction areas. SPPC would repair all range improvements damaged or removed during construction activities immediately after construction is completed.

❑ ***Impact Range-3: Temporary Loss of Grazing Allotment Acreage***

As shown in Table 3.8-2, project construction activities would temporarily disturb between 2,000 and 2,177 acres of available forage in grazing allotment areas, depending on the route alternative selected. With the exception of Segment A, of which only 49 percent is designated as a grazing allotment, 100 percent of all other segments have grazing allotments. These numbers are based on large mapped polygons as shown on Figure 3.8-1. Private land, developed and disturbed lands, mines, and roads are not deducted from these estimates. This would not be a significant impact as disturbed areas would be revegetated after construction, as described in Appendix E, Reclamation Plan. The project would not significantly disrupt traditional grazing practices. No mitigation is necessary.

TABLE 3.8-2 TEMPORARY DISTURBANCE OF BLM GRAZING ALLOTMENTS

Route Alternative	Temporary Disturbance (acres)*	Total Route in Allotments (miles)
Crescent Valley		
(a)	2164.3	177.3
(b)	2176.5	177.8
Pine Valley		
(a)	2068.0	170.4
(b)	2080.2	170.9
Buck Mountain		
	2000.3	158.7

**This table is based on the temporary construction-related disturbance estimates contained in Chapter 2, Table 2-5. Adjustments have been made to reflect the fact that the Falcon substation and about half of Segment A are not within BLM grazing allotment areas.*
Source: EDAW GIS based on BLM and SPPC data.

❑ ***Impact Range-4: Long-term Loss of Grazing Allotment Acreage***

As shown in Table 3.8-3, after construction, the project would result in the long-term loss of between 237 and 265 acres of livestock grazing area and 18 to 15 AUMs under any of the five

route alternatives. The greatest number of AUM losses from any one particular allotment area would be 4 AUMs from the Roberts Mountain Allotment along the Pine Valley (a) route alternative. However, this would be a minor impact and would not require mitigation.

TABLE 3.8-3 LONG-TERM DISTURBANCE OF BLM GRAZING ALLOTMENTS

Route Alternative	Long-Term Disturbance (acres)*	Total Route in Allotments (miles)
Crescent Valley		
(a)	264.5	177.3
(b)	265.2	177.8
Pine Valley		
(a)	254.5	170.4
(b)	255.4	170.9
Buck Mountain		
	237.4	158.7

**This table is based on the long-term disturbance estimates contained in Chapter 2, Table 2-6. Adjustments have been made to reflect the fact that the Falcon substation and about half of Segment A are not within BLM grazing allotment areas.*
Source: EDAW GIS based on BLM and SPPC data.

❑ ***Impact Range-5: Potential Long-Term Loss of AUMs within BLM Grazing Allotments***

The project could result in the long-term loss of AUMs (animal unit months) within BLM grazing allotment areas. Table 3.8-4 estimates the number of AUMs that would potentially be lost with each of the alternatives. The Pine Valley (a) and (b) route alternatives would involve the fewest AUMs lost (approximately 14 to 15), Buck Mountain would remove around 15 AUMs and the Crescent Valley (a) and (b) routes the most with 17 to 18 AUMs lost. This would be a minor impact and would not require mitigation.

TABLE 3.8-4: POTENTIAL LONG-TERM LOSS OF AUMS WITHIN BLM GRAZING ALLOTMENTS

Route Alternative	Grazing Allotment Disturbance (acres)*	AUMs Potentially Lost	Number of Allotments	Total Route within Allotments (miles)
Crescent Valley				
(a)	264.5	18.1	21	177.3
(b)	265.2	17.6	23	177.8
Pine Valley				
(a)	254.5	14.8	23	170.4
(b)	255.2	14.3	26	170.9
Buck Mountain				
	237.4	15.0	27	158.7

**This table is based on the long-term disturbance estimates contained in Chapter 2, Table 2-6. Adjustments have been made to reflect the fact that the Falcon substation and about half of Segment A are not within BLM grazing allotment areas.*
Source: EDAW GIS based on BLM and SPPC data

Livestock and Crops

High voltage transmission lines traverse thousands of miles of farmland where livestock and crop production is commonplace under and near these lines. Over the years, farmers have raised concerns

about the potential for electric or magnetic fields (EMF) to adversely affect livestock, wildlife, or crops. There have been a number of studies of animals conducted concerning the biological effects of electric and magnetic fields on laboratory animals, farm animals, and wildlife. In animals, measurements of biological effects include such endpoints as growth, estrus, breeding efficiency, fetal effects, milk production, litter size, chemical, blood, enzyme effects, and behavior (e.g., Amstutz 1980, Battelle 1981, Klein 1971, Morhardt 1984, PSU 1985a, WICHE 1975, Wouldiams 1979). The results from these studies support the conclusion that the electric and magnetic field levels found under normally operating high voltage lines, including the proposed 345 kV transmission line, do not produce adverse effects in livestock or wildlife. A number of studies have been made of the effects of electric and magnetic fields on food crop production and yields (e.g. AEP 1979, PSU 1985b). No significant adverse effects on plants or crops have been identified.

- ***Impact Range-6: Temporary Impacts to Wild Horses in Herd Management Areas***

  Wild horses from eight HMAs may be temporarily affected by project construction activities such as drilling, blasting, and sock line installation via helicopter, which could cause wild horses to flee these areas. These impacts would not be significant. However, the Rocky Hills and the Diamond Hills North HMAs could have greater stress for available forage since fires affected both of these HMAs in 1999. The 2000 fires did not affect HMAs near the study area (Figure 3.4-1). These two HMAs, however, are only peripherally transected by the proposed routes along Segments B and E (the Crescent Valley and Buck Mountain route alternatives, respectively; see Figure 3.8-2).

Alternative-Specific Impacts

There is very little difference in impacts between the route alternatives, and none of the impacts are considered significant. The Crescent Valley (a) and (b) route alternatives would cause the greatest extent of long-term disturbance in BLM grazing allotment areas (around 265 acres total); the Pine Valley (a) and (b) routes are in the middle with around 255 acres; and Buck Mountain would have the fewest with 237 acres. For potential loss of AUMs within BLM grazing allotment areas, the Pine Valley (a) and (b) route alternatives would involve the fewest AUMs lost (approximately 14 to 15), Buck Mountain would remove around 15 AUMs and the Crescent Valley (a) and (b) routes the most with 17 to 18 AUMs lost. However, as explained above, this would be a minor impact and would not require mitigation.

Summary Comparison of Route Alternatives

TABLE 3.8-5: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Range-1: Impact to Available Water Sources	X	X	X	X	X
Impact Range-2: Impact to Range Improvements	X	X	X	X	X
Impact Range-3: Temporary Loss of Grazing Allotment Acreage	X	X	X	X	X
Impact Range-4: Long-term Loss of Grazing Allotment Acreage	X	X	X	X	X
Impact Range-5: Potential Long-term Loss of AUMs within Grazing Allotments	X	X	X	X	X
Impact Range-6: Temporary Impacts to Wild Horses in Herd Management Areas	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation, residual impacts to grazing acreage, AUMs, and grazing permittees would be minor. There would be no residual impacts to wild horses.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to range resources associated with this project would not occur. However, range resource impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

3.9 VISUAL RESOURCES

This section provides an overview of visual resources associated with the Falcon to Gonder project. It includes a description of the analysis area, methodology, and BLM management plans and policies relevant to visual resources in the study area. This is followed by an assessment of potential visual impacts and mitigation measures.

3.9.1 AREA OF ANALYSIS AND METHODOLOGY

The area of analysis for visual resources covers 1.5 miles on either side of the proposed transmission line (3-mile wide corridor) and 29 Key Observation Points (KOPs) selected along the route alternatives. One mile is generally the extent at which human-made features are visible. In general, features beyond this zone are so distant that only forms and outlines are discernable, and visual impacts are negligible.

Visual resources, as defined by the BLM, are the visible physical features of a landscape (e.g., land, water, vegetation, animals, structures, and other features). All lands have inherent visual values, which warrant different levels of management, as it is neither desirable nor practical to provide the same level of management for all visual resources. For example, management of an area with high scenic value might be focused on preserving the existing character of the landscape, while management of an area with little scenic value might allow for major modifications. Determining an area's visual resources requires an assessment of the area's inherent scenic values (i.e., its visual appeal), assessing public concern for scenic quality, and developing appropriate management levels to protect it.

REGULATORY FRAMEWORK

Visual Resource Management (VRM) System

The proposed transmission line predominantly traverses lands administered by the BLM and is subject to the BLM Visual Resource Management (VRM) System. The Federal Land Policy and Management Act of 1976 (FLPMA) states that "...public lands would be managed in a manner which would protect the quality of the scenic (visual) values of these lands." Visual resources are to be considered in all BLM planning and environmental assessment documents.

To meet its responsibility to maintain the scenic values of public lands, the BLM has developed the VRM System. The VRM System is implemented through the Resource Management Plan (RMP) or Management Framework Plan (MFP) process (BLM 2000b). The VRM system inventories scenic values and establishes Visual Resource Management Classes (VRM Classes) for those values through the RMP process. Visual resource classes are categories assigned to public lands, which serves two purposes: (1) an inventory tool that portrays the relative value of the visual resources, and (2) a management tool that portrays the visual management objectives. The system identifies four classes: I, II, III, and IV.

Visual Resource Inventory

The visual resource inventory process provides BLM managers with a means for determining visual values of the landscape. Visual resource inventory classes are assigned through the inventory process based on scenic quality evaluations, sensitivity level analysis, and delineation of distance zones. BLM-administered lands are placed into one of four visual resource inventory classes. These inventory classes represent the relative value of the visual resources, Classes I and II having the highest values, Class III representing moderate value and Class IV being of least value.

The inventory classes only provide a basis for establishing visual values and do not establish management direction. The information provides a basis for considering visual values in the RMP process where management objectives are assigned.

Visual Resource Management Classes

Visual Resource Management (VRM) Classes are typically arrived at through the resource management planning process. The area's inventoried visual resources are assigned to VRM Classes with established management objectives. The objectives of each VRM Class, as stated in the BLM Handbook, Visual Resource Inventory (BLM 1986a), are as follows:

- ***VRM Class I*** – The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- ***VRM Class II*** – The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- ***VRM Class III*** – The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of he characteristic landscape.
- ***VRM Class IV*** – The objective is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Interim Visual Resource Management Classes and Objectives

Interim visual management objectives are established when a project is proposed and there are no RMP or Management Framework Plan-approved VRM objectives. These objectives are developed using the guidelines in BLM VRM Manual Section 8410, Visual Resource Inventory, and must conform with the land use allocations set forth in the RMP which covers the project area.

Bureau of Land Management RMPs

Within the study corridor, three BLM field offices manage visual resources: the BLM's Elko Field Office manages the Elko planning area; the Battle Mountain Field Office manages the Shoshone-Eureka planning area; and the Ely Field Office manages the Egan planning area. With the exception of the Egan planning area, the RMPs for each of these areas contain visual management objectives related to visual resources.

Shoshone-Eureka RMP

The Shoshone-Eureka Planning Area contains 4.4 million acres of public land in north-central Nevada administered by the Battle Mountain District BLM (BLM 1984b). The area includes three principal towns: Austin, Battle Mountain, and Eureka. It encompasses most of Lander and Eureka Counties and a portion of Nye County. VRM Classes within its jurisdiction include Class II, III, and IV.

Elko RMP

The Elko RMP is a long-range plan to manage public lands within the Elko planning area of north-central Nevada (BLM 1986c). The Elko planning area consists of three units, the North Fork, Buckhorn, and Tuscarora, covering of approximately 5.9 million acres in the western half of Elko County and the northern portion of Lander and Eureka Counties. Over 3.1 million acres are public lands administered by the BLM. VRM Classes within its jurisdiction include Class II, III and IV. This RMP also designates the I-80 highway as a Low Visibility Corridor. The Low Visibility Corridor is a 3-mile wide (where possible) passage on which existing utility, transmission, and transportation facilities are located and for which future needs may be accommodated if the new facility is not evident in the characteristic landscape. The objective for visual resources within this corridor is for management actions not to be evident in the characteristic landscape.

Egan RMP

The Egan RMP is a 20-year plan to manage 3.8 million acres of public land within the Egan planning area in east-central Nevada, managed by the Ely District of the BLM (BLM 1984a). The majority of the planning area is located in White Pine County, although portions are also located in Nye and Lincoln Counties. In the Egan RMP, visual resources were not considered to be a land use issue; therefore, inventory, evaluation, and determination of VRM objectives were not completed. In conformance with the visual resource management policies of the BLM, the Egan RMP has established interim VRM Classes. Class I areas encompass the Mount Grafton Scenic Area; the designated BLM part of Currant Mountain Wilderness; the Goshute Canyon, Park Range, Riordan's Well, and South Egan Range WSAs; and Heusser Mountain Bristlecone Pine Natural Area and Goshute Canyon Natural Area Instant Study Areas (ISAs). Class II areas include the Ragged Ridge Scenic Area, the Pony Express Trail Corridor, and the Bristlecone Pine Interpretive Area. Class III areas include the existing campgrounds at Illipah reservoir, Garnet Hill, Cold Creek, and Goshute Canyon; proposed development areas at Antelope Summit, Bassett Lake, Cumins Lake, and along the Horse and Cattle Camp Backcountry Byway route; the Ward Mountain Winter Sports Area and the Egan Crest Trail route; and all mountain ranges, with the exception of portions that have been substantially altered by mining activities at the Robinson Mining Districts, Buck and Bald, White Pine, and Cherry Creek areas. Class IV areas consist of valley floors and lower slopes located below forested benchlands, and the mining areas excluded from Class III areas.

Wilderness Study Areas

A number of Wilderness Study Areas (WSAs) exist within the region. These are areas that possess wilderness characteristics and may have been recommended for consideration by the U.S. Congress for designation as wilderness. WSAs are areas that are roadless, natural in condition, and possess high scenic values. WSAs are currently managed under the BLM's Interim Management Policy (IMP) and Guidelines for Lands Under Wilderness Review (BLM 1995) until legislation takes effect to change their status. The major objective of the IMP is to manage lands under wilderness review in a manner that does not impair their suitability for designation as wilderness. In general, the only activities permissible under the IMP are temporary uses that create no new surface disturbance nor involve permanent placement of structures.

The closest one to the project is the Roberts Mountain WSA, located approximately 40 miles northwest of the town of Eureka. The Roberts Mountains WSA consists of 15,090 acres of the rugged Roberts Mountains and its three prominent peaks. Roberts Mountain has been inventoried in the Shoshone-Eureka RMP by the Battle Mountain District and has been assigned to VRM Class II.

State Scenic Byways Program

At various locations, the project traverses U.S. Highway 50, a State of Nevada designated Scenic Byway. However, the designation does not carry any legal protection or require compliance with visual resource protection policies[1].

METHODOLOGY

Impacts to visual resources were identified by considering what effects the project could have on the existing landscape through the evaluation of KOPs, and its potential conflicts with visual resource management objectives. The process typically includes: (1) establishing KOP locations along the transmission line in coordination with the BLM to evaluate visual impacts; (2) determining the visual contrast rating of the proposed transmission line from selected KOPs; (3) evaluating the visual contrast rating against the established VRM or interim VRM class objectives; (4) if applicable, evaluating the visual contrast rating against the cultural resource site's level of visual sensitivity; (5) assigning an impact rating to the proposed transmission line; and (6) developing mitigation measures to reduce adverse visual impacts of the transmission line.

To assess the extent of project-related visual impacts in the study area, the BLM VRM System is used to determine the proposed level of change in the landscape and whether it conforms to interim and established VRM Class objectives. Impacts on visual resources within the study corridor could result from various activities, including construction and operation of the transmission line, substation expansions, centerline travel route, and the temporary use of spur roads and material yards.

The route was visually inspected from various public roads and vantage points to develop an overall assessment of the potential impacts. BLM staff[2] established 29 Key Observation Points (KOPs) to assess the potential project impacts on sensitive visual resources, scenic landscapes, and vistas along the five transmission line route alternatives. Figure 3.9-1 at the end of this section illustrates the locations and view orientation of each KOP. KOPs are located:

- Along major or significant travel corridors (e.g., Interstate 80, Highway 50, Highway 306, and Highway 278);
- At or near cultural, historic, and prehistoric sites (e.g., Pony Express Trail, Eureka-Palisade Railroad grade); and
- Near residential areas (e.g., Crescent Valley, Warm Springs Ranch).

Locations were selected to be typical views of the proposed transmission line as seen by a casual viewer and to portray potential impacts that could occur along the route.

At each KOP, the existing visual setting and proposed route location were evaluated. To characterize the potential impacts on scenic quality and the viewer's experience, photosimulations were prepared by introducing the transmission line and towers. The purpose of the photosimulation is to approximate the anticipated long-term appearance of the project in the existing landscape to evaluate potential visual impacts. Each KOP is evaluated using the BLM Visual Contrast Rating System and assigned a contract value of Strong, Moderate, or Low to None. Photosimulations are presented for 23 of the 29 KOPs, showing both the existing conditions and with project conditions (see Figures 3.9-2 through 3.9-30, at the end of this section). Four KOPs serve as context photos. Two KOPs representing a geologic feature were not simulated but were evaluated against the VRM system.

[1] Personal communication with JohnWhitaker, NDOT Roadway Information Systems Division, July 12, 2000.
[2] BLM Staff: Walt Brown, Christi Shaw, Steve Dondero, Timothy Murphy, and Mark Henderson, and Susan Howle.

The contrast can be measured by comparing the project's features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the project. The contrast rating is used to determine whether the proposed level of change in the landscape would meet the management objectives established for the area. The level of impact can then be determined by comparing the contrast rating with the appropriate VRM Class objective in Table 3.9-1. The basic philosophy underlying the system considers the following: The degree to which a proposed activity affects the visual quality of a landscape depends on the visual contrast created between the proposed activity and the existing landscape.

TABLE 3.9-1: VISUAL IMPACT LEVEL

Visual Contrast[1]	Visual Resource Management Class		
	II	III	IV
Strong[2]	High	High	Medium
Moderate[3]	High	Medium	Low-None
Low-None[4]	Medium	Low-None	Low-None

[1]Visual contrast is evaluated for each segment of the proposed transmission line at selected KOPs.
[2]The element contrast demands attention, would not be overlooked, and is dominant in the landscape.
[3]The element contrast begins to attract attention and begins to dominate the characteristic landscape.
[4]The element contrast is not visible/perceived or can be seen but does not attract attention.

Impacts to Cultural Resource Visual Settings

Of particular concern are visual impacts to cultural resource sites where the integrity of the surrounding landscape is important to the context of the site. In these cases, the influence of the intrusion of the transmission line on the context of the cultural resource site should be an additional consideration in determining visual impacts. Visual impacts to cultural resources and the methodology used to determine the level of impact are discussed in Section 3.16, Cultural Resources. However, the visual simulations of the KOPs for these sites remain in this section.

3.9.2 AFFECTED ENVIRONMENT

This section provides an overview of the affected environment within the 3-mile wide study corridor (i.e., 1.5 miles on each side of the centerline). This area includes lands under private and federal ownership. The study corridor spans the northern reaches of the physisographic or geologic province of the Great Basin, a region characterized by uplifted and titled ranges punctuated by intervening valleys (Stewart 1980).

Ranges found along the corridor include Malpais Range (northern arm of Shoshone Range), Cortez Range, Sulphur Spring Range, Roberts Mountain, Egan Range, and the southern Cherry Creek Range. Valleys include Boulder Flat, Whirlwind, Crescent, Grass, Pine, Koben, Diamond, Huntington, Newark, Long, and Steptoe. Generally, the mountain ranges are classified as VRM Class II or III and valleys floors classified as Class IV, with the exception of areas that contain significant cultural resources in the Shoshone-Eureka and Elko planning areas.

The 3-mile wide study corridor encompasses approximately 180,815 acres with the majority under BLM jurisdiction. The lands are classified as follows.

- VRM Class II accounts for 2,132 acres, in which the objective is to retain the existing character of the landscape.

- VRM Class III accounts for 39,316 acres, in which the objective is to partially retain the existing character of the landscape.
- VRM Class IV accounts for 139,366 acres, in which the objective allows for management activities that require major modification.

The transmission line would traverse all three VRM Classes, with the majority occurring in VRM Class IV.

3.9.3 ENVIRONMENTAL CONSEQUENCES

The following section examines the project's likely impacts on visual resources. As many of the route alternatives share segments (e.g., Segments A and J are common to all of the routes), the analysis first addresses impacts common to all of the route alternatives. It then examines impacts specific to each of the route alternatives. This serves to reduce redundancy in discussion of the impacts and to present a clearer comparison of the alternatives. A discussion of the No Action Alternative is also included.

It should be noted that it is BLM policy to minimize all adverse visual impacts to the extent possible and not just those that are considered significant. Impacts to visual resources can be measured by the amount of change or degradation to the character of the natural landscape as seen from sensitive viewpoints, and whether the management objectives of applicable VRM Classes can be met. A guiding premise in conducting these impact analyses has been that all segments of the transmission line would result in some degree of visual change, since every segment would be sufficiently visible from some location (even though it may be remote). However, the more important consideration would be the level of significance the impact is considered to impose in areas that BLM has considered sensitive.

SIGNIFICANCE CRITERIA

Significance criteria for identifying impacts to visual resources include the following.

- **Significant/High Visual Impact** - The visual contrast of the project would exceed the VRM Class guidelines for an area, or conflict with applicable plans and adopted policies of government agencies and would result in a high visual impact.
- **Medium Visual Impact** - The visual contrast of the project would be fully at, but not exceed, the VRM Class guidelines for that area and would not be considered a significant visual impact.
- **Low/No Visual Impact** - The visual contrast of the project is clearly within the VRM Class guidelines for the area and would not be considered a significant visual impact.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to All Route Alternatives

The following section presents impacts to visual resources that would be common to all of the route alternatives (i.e., they would occur with any of the route alternatives). Potential direct and indirect impacts to visual resources that could occur along any of the route alternatives include:

- Construction impacts;
- Effects of new spur roads and centerline travel route;
- Effects of vegetation removal; and

- Effects on occupied homes along the proposed routes.

Construction Impacts

Construction impacts on visual resources would result from the presence of equipment, materials, and work force at the material yards and construction areas along the route, and from the temporary alteration of landforms and vegetation along the right-of-way. Residents or people seeking outdoor recreation activities in the vicinity of the route would see construction equipment and activities from the travel corridors and roads in proximity to the project. View durations would vary from brief to extended. Construction activities would be most visible for those portions of the project adjacent to major travel corridors (Interstate 80, U.S. Highway 50, Highway 278, Highway 306, and Highway 892) or in proximity to communities (Dunphy and Crescent Valley).

Seven potential locations have been identified for construction materials yards, as shown on Figure 2-10 in Chapter 2.

1. Site #1 is located at an industrial site adjacent to Interstate 80 near Dunphy (Conoco Mining Lubricants site).
2. Site #2 is located at an old mine site located on Highway 306. The proposed yard would be located on both sides of the highway.
3. Site #3 is located at an agricultural site along the northern part of Highway 278.
4. Site #4 is located on agricultural land along the southern part of Highway 278 in Diamond Valley.
5. Site #5 is located on BLM land located within a mining complex on previously disturbed grounds.
6. Site #6 is located on the east side of Highway 93 near the highway and railroad crossing.

SPPC would obtain permission from property owners and/or agencies to use the material yards. Five of the six sites are located next to highways, and two are located next to rail sidings. The sites were selected based on existing land uses, existing surface disturbance, potential for successful reclamation, and suitable access to both major roadways and rail sidings. It is anticipated that four or five construction yards would be needed to construct the project, each averaging 20 acres in size. The yards would be used for materials, equipment, and fuel storage; maintenance activities; the contractor's office; and parking. The material yards would be restored to the condition that they were in prior to the start of construction or as otherwise agreed upon by SPPC and the property owners. It is anticipated that Sites #1, #2, #3, #4, and #6 would be visible from major highways and county roads but would not create a adverse visual impact due to their location on previously disturbed sites. However, Sites #3, #4, and #6 would require new ground disturbance resulting in a visual contrast that may create a short-term visual impact.

❑ ***Impact Visual-1: Potential Visual Impacts During Construction***

Use of construction material yards may create a short-term adverse visual impact; however, this impact would be less-than-significant. Mitigation is not required.

Direct effects to visual resources along the entire study corridor would stem from the surface disturbance required for the improvements to existing access roads, clearing the centerline travel route and temporary spur roads, and clearing vegetation around tower sites. Access roads are defined as existing roads that might be used to access the construction and maintenance sites from the nearest State Highway, US Highway, and County roads. SPPC proposes to use three types of access roads to construct the project: paved roads, dirt roads that do not require improvements, and dirt roads that may require improvements. Paved roads and dirt roads that do not require improvement account for approximately 50% of the total access road mileage in the study area. Use of these is not expected to have adverse impacts to visual resources. However, the resulting visual contrast created from the

improvement of dirt roads may potentially have an adverse visual impact if they exceed the established or interim management objectives for the area.

Temporary spur roads would be cleared in areas where existing access roads parallel the route alignment and would be used to avoid clearing a new centerline travel route. Spur roads would be about 30-feet wide, would extend from the existing parallel access roads to the tower locations, and would be reclaimed by SPPC after project completion. Spur roads may be used along Segments A, B, and I (located in VRM Class III and IV areas). Clearing of spur roads is generally consistent with the management objective of the VRM Classes and, with the proposed reclamation efforts, is not considered a significant visual impact.

Vegetation would be cleared to create a centerline travel route for vehicle and equipment access to the tower sites. The centerline travel route would be an average of 12-15 feet wide, but would be expanded up to about 30 feet wide maximum in some areas to provide passing areas and turnouts. Tables 2-5 and 2-6 in Chapter 2 estimate the extent of temporary and long-term disturbance associated with the centerline travel route. Segments A, B, and I may be close enough to existing parallel roads that construction of a centerline travel route could be avoided by clearing temporary spur roads to access the tower locations.

After construction, SPPC would revegetate the centerline travel route. However, it is expected that the annual inspections by SPPC workers on ATVs would eventually create a two-track dirt path (about 12 feet wide) along the revegetated centerline travel route. The majority of the study corridor is located in VRM Class III and IV areas, and the transmission line would be generally consistent with the established management objectives. Therefore, no significant visual impact is expected in these areas.

Significant visual impacts as a result of improved access roads, spur roads, and the centerline travel route are expected with the vicinity of KOPs 5, 15, 17, 21, and 24. The project, as proposed and viewed from these locations, is considered to exceed the established VRM Class objectives and therefore has a significant impact to visual resources. It is reasonable to conclude that surface disturbance in these areas would further contribute to visual degradation

❑ ***Impact Visual-2: Access Road Impacts within the Vicinity of KOPs 5, 15, 17, 21, and 24***

Improvement of existing dirt access roads, new temporary spur roads, and the centerline travel route along the transmission corridor would create a significant visual impact within the vicinity of KOPs 5, 15, 17, 21, and 24.

❑ ***Mitigation Measure Visual-2***

After selection of the preferred route and certification of this EIS, SPPC should implement mitigation measures to reduce the visual contrast by implementing the following measures.

- Restore areas that are not needed for operation and maintenance to something close to the previous condition.
- Use topographic features and landforms to screen the spur roads and centerline travel route where feasible.
- Retain existing rock formations and vegetation whenever possible.
- Construct access roads and the centerline travel route at appropriate angles from the originating primary travel route to minimize extended, in-line views of newly graded terrain. This mitigation is dependent upon the ability to safely construct, maintain, and utilize the road/route.

❑ ***Impact Visual-3: Visual Impacts Due to Vegetation Removal***

Direct effects to visual resources along the corridor would stem from the removal of vegetation to provide the necessary electrical clearance. Generally, all trees over 15 feet in height and within 55 feet of the centerline would be removed to provide the necessary clearance. This would result in the introduction of a linear feature in the landscape that generally is hard to mitigate. Additionally, removal of tree cover would expose the ground surface, which is generally lighter in color, and result in a strong visual contrast.

❑ ***Mitigation Measure Visual-3***

- Trees greater than 15 feet tall should be cut or topped to the minimum necessary height to provide for a conductor clear zone. Trees shorter than 15 feet should not be cut or trimmed unless they directly conflict with a structure site or wire stringing area.
- The edges of the corridor alignment should be feathered, thinned, and/or scalloped to minimize the impacts of a strong edge feature in the landscape.
- Allow trees proportionally greater than 15 feet tall to remain near structure sites where the conductor is supported at its highest elevation.
- SPPC's Reclamation Plan (see Appendix E) should include measures to revegetate the disturbed areas to minimize the visual contrast created by the bare ground.

❑ ***Impact Visual-4: Conflicts with VRM System Goals and Objectives***

The overall goal of the BLM's VRM System is to minimize visual impacts and ensure that mitigation measures are applied to adverse visual contrast conditions. These include reduction of contrast in project areas that meet the VRM objectives and are not considered to be significant impacts. The following visual design techniques should be used to reduce the overall contrast of the transmission line along all route segments regardless of level of impact.

❑ ***Mitigation Measure Visual-4***

(a) Whenever possible, site the transmission line away from prominent viewing locations. Visual contrast decreases as the distant between the viewer and proposed development increases.

(b) Whenever possible, site the transmission line off of prominent topographic features.

(c) Due to the prominent structural contrast of angle towers, site angle towers off of prominent topographic features.

(d) Restore all disturbed areas that are not required after construction is completed.

(e) Whenever possible, use existing vegetation and topographic landforms to screen the transmission line.

(f) Establish limits of disturbance that reflect the minimum area required for construction.

(g) Widen the distance between towers to the maximum extent possible when the transmission line crosses a road.

❑ ***Impact Visual-5: Impacts on Occupied Homes***

The project is generally located in a rural setting away from populated areas; however, it sometimes would traverse within the vicinity of occupied homes. Especially notable locations are where the transmission line would be visible in the immediate foreground to middleground viewing distance. In these areas, residents may perceive the transmission line as permanently degrading the scenic quality of the existing landscape. The project may cumulatively contribute to the proliferation of built structures and the attendant sense of urbanization. While various segments of the transmission line would result in low to moderate visual impacts in the

landscape and are not considered significant when analyzed using the BLM VRM system, individual residents along the route could potentially experience adverse impacts if the transmission line is a prominent feature in the landscape.

Table 3.9-2 estimates the number of existing occupied homes that would be located within 3,500 feet (approximately 0.66 mile) of the transmission line. Many of these are mobile homes. Depending on the route alternative, 12 to 30 of the homes would be within 1,000 feet of the transmission line, where the prominence of the transmission line towers and conductors would be within the immediate foreground view and potentially create a high visual contrast. Another 138 to 153 would be within 1,000 to 3,500 feet, where the visual contrast would be reduced due to greater distance. From these residences, the transmission line could be visible in the middleground to background views and potentially create a medium to low visual contrast.

TABLE 3.9-2: ESTIMATED NUMBER OF OCCUPIED HOMES NEAR THE PROPOSED TRANSMISSION LINE

Route Alternative	Within 1,000' of Centerline	1,000-3,500' of Centerline
Crescent Valley -- A	27	149
Crescent Valley -- B	30	153
Pine Valley -- A	16	149
Pine Valley -- B	19	153
Buck Mountain	12	138

Source: Stantec helicopter GPS survey, EDAW analysis 2000.

Mitigating the visual contrast in the middleground to background view is easier to accomplish by applying visual design techniques or slightly adjusting the alignment of the transmission line. Very low or no visual contrast is expected to residences located greater than 3,500 feet from the transmission line. This is due in part to the far distance and the ability of the landscape to absorb visual change at such far distances.

The BLM VRM System is designed to address impacts of development on identified visual resources on public lands and not impacts to private residential uses; therefore, this impact cannot be quantified and cannot be considered significant. However, consistent with BLM policy, the overall visual effect of the project should be reduced by all means possible. After certification of this EIS, SPPC should employ visual design techniques where possible to reduce the overall visual contrast of the transmission line in areas where it comes within 3,500 feet of occupied residences.

❑ ***Mitigation Measure Visual-5***

- Evaluate affected residences' viewshed along the preferred route alternative.
- Where possible, site the transmission line towers to minimize impacts on occupied residences' viewsheds.
- Consider employing other visual design techniques as described in Mitigation Measure Visual-4, as appropriate.

Segment A

Segment A is common to all route alternatives. The land within Segment A is primarily open, flat, and sparsely developed. A portion of Segment A, near the I-80 highway, is in a VRM Class III area. The

only developments within Segment A are existing transmission line facilities, one commercial structure, a mine, rural residential uses, and roads. The transmission line facilities include an existing 120 kV line and 69 kv line and the Falcon substation. The transmission line within Segment A would parallel the existing lines for the entire length of this segment and cross the I-80 highway within proximity of the Dunphy roadside stop. Segment A would be visible to westbound and eastbound traffic on I-80. As mentioned previously, BLM's Elko planning area RMP designates the I-80 highway as a low visibility corridor. The low visibility corridor is a 3-mile wide (where possible) passage on which existing utility, transmission, and transportation facilities are located and for which future needs may be accommodated if the facility is not evident in the characteristic landscape. The objective for visual resources within this corridor is for management actions not to be evident in the characteristic landscape.

KOP 1 was established on I-80 approximately one-half mile west of the transmission line with a view looking northeast. As seen in the photosimulation prepared for KOP 1, the new transmission line would be located near an existing wood pole line. Motorists would observe them both together in the foreground/background view from the highway. The VRM analysis resulted in a moderate visual contrast in the landscape that is consistent with the objectives of VRM Class III. Thus, Segment A would create a medium visual impact along the I-80 highway in the vicinity of KOP 1, but it is not considered a significant visual impact. However, as discussed in Chapter 5, the Elko RMP would need to be amended to modify a previous decision and allow the transmission line to cross the low visibility corridor along I-80.

Segment J

Segment J is also common to all route alternatives. Segment J is approximately 33 miles in length and would traverse the primarily open and undeveloped lands at the southern end of Long Valley, the Butte Mountains, Jakes Valley, and the Steptoe Valley. Segment J is located within an existing designated utility corridor and would parallel SPPC's existing 230 kV transmission line to the Gonder substation and cross over US 50. Segment J would primarily traverse interim VRM Class III and Class IV areas.

Five KOPs (25-29) were established along Segment J to characterize the potential visual impacts of this segment. KOPs 25-28 are located along US 50 and KOP 29 is located at the Gonder substation. All four KOPs rated contrasts would be consistent with the interim VRM Class objectives; therefore, Segment J would result in low to medium visual impacts. Thus, Segment J would have no significant visual impact.

KOP 25 was established 600 feet northwest of Segment J where it crosses Ruby Lake Road in the vicinity of Sammy Springs. The area is primarily flat with low-lying vegetation and a moderately dense stand of trees. To the right of the view, a prominent landform provides a backdrop in the middleground view to an existing transmission line running toward the southeast. Segment J would be offset approximately 1,000 feet from the existing transmission line. Segment J would directly be visible in the immediate foreground view crossing over Ruby Lake Road and receding into the distant horizon. A transmission tower and its conductors would be seen against the skyline in the immediate foreground view but is visually absorbed by the dark colors of the landforms in the middleground to distant background. The resulting visual contrast is moderate and is consistent with VRM Class III for the area. Thus, Segment J as seen from KOP 25 would result in a medium visual impact and is not considered significant.

KOP 26 was established 0.3 mile northeast of Segment J where it crosses US 50 in Jakes Valley. The area is primarily flat with low-lying vegetation with very few trees and is backdropped by the White Pine Mountain Range in the very far distant view. An existing transmission line is visible crossing the highway in the foreground to the middleground view approximately one-half mile away. Segment J would be visible crossing the viewer's line of site in the immediate foreground view crossing US 50. The resulting

visual contrast would be moderate and is consistent with VRM Class IV for the area. Thus, Segment J as seen from KOP 26 would result in a low visual impact, which is not considered significant.

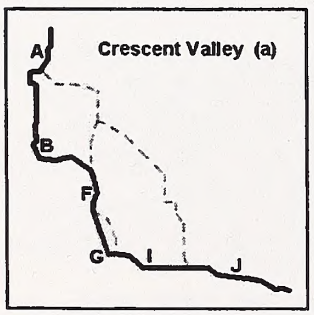
KOP 27 was established adjacent to Segment J approximately one mile south of Robinson Summit on US 50. The area is primarily hilly and covered with a dense stand of trees. The hills are the prominent features in the landscape and provide a backdrop for the viewshed in the foreground to middleground view. To the right of the viewshed, SPPC's existing 230 kV transmission line is visible traversing the hill. Segment H would be visible traversing the highest point of the ridgeline in an easterly direction. The towers are partially backdropped by the hill, but the tops are prominently skylined on the nearby ridgeline. Proposed access roads would be evident due to the nature of the topography and due to vegetation removal. The transmission line and required vegetation removal would create a strong visual contrast which is inconsistent with the interim VRM Class III for this area. Although the transmission line is inconsistent with the management objectives for this area, Segment J is located in a designated utility corridor; thus, Segment J as seen from KOP 25 would result in a medium visual impact and is not considered significant.

KOP 28 (Hercules Gap) was established just north of US 50 and 0.4 mile west of Hercules Gap. Hercules Gap is a prominent topographic feature that dominates the landscape and provides the backdrop for the viewshed. Existing rural residential uses are visible in the middleground, framed by Hercules Gap, and an existing transmission line is visible traversing the far right. From KOP 28, one Segment J transmission tower and its conductors will be visible traversing over the right side of Hercules Gap. The tower is prominently located at the ridge top. The resulting visual contrast would be moderate and is consistent with the VRM Class III assigned to this area. Thus, Segment J as seen from KOP 28 would result in a moderate visual impact, which is not considered significant.

Alternative-Specific Impacts

In addition to the impacts that would be common to all route alternatives, the following presents impacts that would be associated with specific route alternatives. Because each of the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

Crescent Valley (a) Route Alternative



The Crescent Valley (a) route alternative is comprised of Segments A, B, F, G, I, and J. In addition to the impacts common to all route alternatives discussed above (i.e., Impact Visual-1 through –5), specific impacts for the Crescent Valley (a) route alternative are described below.

Segment B

The land within Segment B is primarily open, flat, and sparsely developed. The developments within the Segment B study corridor include existing transmission line facilities, roads, mining operations, and rural residential uses. Segment B would parallel existing 120 kV and 69 kV transmission lines for much of its length. Segment B traverses the western side of Whirlwind Valley prior to heading south toward the Cortez Mountains. Within Segment B, there are two potential re-routes (the K and L re-routes), as discussed below.

Six KOPs (2-7) were established along Segment B to characterize the potential visual impact of this segment. All the KOPs, with the exception of KOP 5, create low to medium visual impacts and would meet their VRM Class objectives.

KOP 2 was established at a unique geologic feature to assess the impacts to the visual setting of this site. From this location, the transmission line traverses primarily open, flat, and undeveloped lands with mountain landforms serving as a backdrop to the view. From KOP 2, Segment B (via the L re-route) is located approximately 1.5 miles away at its nearest point and just visible in the background view. It is subordinate to the landscape and results in a moderate degree of visual contrast consistent with the VRM Class IV assigned to this area. Thus, Segment B (via the L re-route) as seen from KOP 2 would result in a low visual impact and is not considered significant. Due to the same reasons listed above, Segment B would result in medium visual impacts to the visual setting of the geologic feature and is not considered a significant impact.

KOP 3 and KOP 4 were established on Highway 306. KOP 3 is located just south of the town of Crescent Valley. The landscape is primarily flat with existing rural residential development and wood pole transmission lines. KOP 4 is located farther south on Highway 306 and 0.4 mile north of the transmission line crossing. The volume of viewers in both of these areas is generally low to moderate. The transmission line would be visible in the middleground view approximately one-half to one mile from the KOPs with a backdrop of mountain landforms and existing transmission lines. The transmission line's prominence in the landscape is low and would generally result in a moderate visual contrast in the landscape. The area is classified as VRM Class IV, and the moderate contrast would result in a low visual impact for this area; thus, a significant impact is not expected within the vicinity of KOPs 3 and 4.

KOP 5 was established in the vicinity of Cortez Canyon Road just south of Cortez Canyon. The area has gently sloping hills with low-lying vegetation and is undeveloped. This area has been inventoried and classified by the BLM as VRM Class III, where the management objective is to retain the existing character of the landscape. The transmission line would be directly adjacent to the KOP 5 and visibly prominent in the foreground view. The transmission towers would skyline the ridgeline, creating a strong visual contrast. Segment B, as seen from KOP 5, would create a strong visual contrast, which is inconsistent with the management policy of partially retaining the existing character of the landscape. For these reason, Segment B would create a significant visual impact within the vicinity of KOP 5.

- ***Impact Visual-6: Impact of Segment B from KOP 5***

  Segment B as seen from KOP 5 would create a strong visual contrast and is inconsistent with the VRM Class III objective of partially retaining the existing character of the landscape.

- ***Mitigation Measure Visual-6***

  Consider re-routing part of proposed Segment B to the west along the K re-route, predominantly in a VRM Class IV area, which allows major modification of the landscape to occur. Implementation of this mitigation measure would constitute low/no visual impact as seen from KOP 5.

KOPs 6 and 7 were established at the southern end of Segment B prior to its convergence with an alternate route, the K re-route. KOP 6 is located in the town of Cortez looking west. The Toiyabe Range serves as a backdrop, and evidence of small-scale historic mining is visible in the immediate foreground view. The area has been inventoried and is classified as VRM Class III. The proposed transmission line would be located approximately one mile from KOP 6 in the middleground view. The transmission line would be closely backdropped by the Toiyabe Mountain Range, which is dark in color, and have the effect of visually absorbing the prominence of the transmission line. The resulting visual contrast would be low and would create a low visual impact, which is consistent with the VRM Class III

objectives. The town of Cortez is considered a significant historic site, but due to the distance from Segment B and KOP 6, no adverse visual impact is expected. Thus, no significant visual impact is expected along Segment B in the vicinity of KOP 6.

KOP 7 is located on Cortez Canyon Road just north of the convergence of Segments B and the K re-route. The area is classified as VRM Class III, the background view is closely backdropped by the nearby Toiyabe Range, and past mining activities are evident. To the right of the viewshed, an existing wood pole transmission line runs north-south in the immediate foreground view. The transmission line would be visible in the foreground/middleground view and would be backdropped by the Toiyabe Range. Segment B would be visible against the sky at the ridgeline and would create a moderate contrast in a VRM Class III area, which is consistent with the management objectives. The resulting visual impact is medium; thus, Segment B would not create a significant visual impact within the vicinity of KOP 7.

K Re-route (along Segment B)

The K re-route was identified as a possible way to avoid sensitive resources on Segment B. The K re-route would diverge from Segment B just north of Cortez Canyon and travel southwest toward Copper Canyon and south through the Toiyabe Range, reemerging south of the Town of Cortez. The K re-route would converge with the original alignment (Segment B) within the vicinity of KOP 7. The area is predominantly hilly and would require the transmission line to cross a number of ridgelines, although it is unlikely that the ridgeline crossing would be visible from KOP 5, 6, or 7. At KOP 5, the K re-route would not be visible and would result in no visual impacts in this area.

From KOP 6, the K re-route would be visible approximately 1.7 miles away, traversing down the slope of the Toiyabe Range in the far distant view. Due to its distance and the Toiyabe Range backdrop absorbing the prominence of the towers, the resulting contrast is expected to be low. This is consistent with the VRM Class III objectives, and the resulting low visual impact is not considered significant.

From KOP 7, the K re-route would potentially be visible emerging at the ridgeline of the Toiyabe Range in the middleground/background view and traversing down the slope toward the foreground view. The K re-route converges here with Segment B. Segment B would be visible off to the left of the viewshed running parallel to the dirt road. As discussed earlier, Segment B would result in a moderate visual impact in a Class III area. The K re-route would be located in a Class IV area; therefore, it would be reasonable to say that the K re-route would have similar or less impact than Segment B. Based on these factors, the K re-route would result in a moderate visual contrast, which is consistent with VRM Class IV objectives. Thus, the K re-route would create a low visual impact, which is not considered significant.

L Re-route (Along Segment B)

The L re-route was identified as a way to avoid sensitive resources on Segment B. The L re-route begins at the north end of Whirlwind Valley and heads west and south toward Cortez Canyon paralleling existing transmission lines. At KOP 2, the L re-route would be barely visible in the far background view and would result in no significant visual impact as viewed from KOP 2. See Segment B for further impact discussion.

Segment F

Segment F is approximately 16 miles in length and completely located in VRM Class IV. The northern portions of Segment F would be located in Garden Valley to the east of Roberts Mountain on primarily open, flat, and sparsely developed lands. The segment would roughly parallel Highway 278 to the west. Lands along the southern portion of the segment near Henderson Summit are more heavily wooded and sloped. KOP 18 was established along Segment F to characterize the potential visual impact of this segment. It is located approximately two-thirds of a mile east of Segment F on Highway 278. The land is primarily flat with dense low-lying vegetative cover and is framed to the right of the viewshed by a hill in the foreground and the Roberts Mountains in the background. Segment F would traverse primarily in

the foreground and middleground view and can be seen against the backdrop of Roberts Mountains. The resulting moderate contrast is consistent with the VRM Class IV objective and results in a low visual impact, which is not considered significant.

Segment G

Segment G would pass to the west of Whistler Mountain on the eastern edge of the Kobeh Valley and would cross U.S. Highway 50, a state-designated Scenic Byway, prior to joining Segment I. Segment G would be predominantly located in VRM Class IV lands.

KOPs 19 and 20 were established along Segment G to characterize the potential visual impact of this segment. KOP 19 is located at the Pony Express Trail, approximately 400 feet east of Segment G as it crosses the trail. The area has gently sloping landforms and is densely covered with trees. Three transmission towers and their conductors would be visible in the immediate foreground view against the sky, resulting in a strong contrast in the landscape. The resulting strong contrast is consistent with the management objectives of Class IV, thus resulting in a medium visual impact that is not considered significant. The project's visual impact on the historic setting of the Pony Express Trail is provided in Section 3.16.3.

KOP 20 was established 0.3 mile west of the proposed crossing of Highway 50 prior to the natural landscape feature called Devil's Gate. The area is primarily flat with low-lying vegetation and low mountains forming the backdrop. To the right of the viewshed is an existing access road to a mining area. KOP 20 would create a strong contrast in the landscape but would be consistent with the management objectives, resulting in medium visual impacts. Thus, Segment G as seen from KOPs 19 and 20 would not have significant visual impacts.

Segment I

Segment I is approximately 30 miles in length and would be located within the southern end of Diamond Valley. This segment would traverse the Diamond Mountains and would head east toward the Newark Valley. Segment I would parallel existing transmission lines for its entire length, including SPPC's 230 kV line and a 69 kV line. The land is primarily open, sparsely developed, and primarily located in VRM Class IV with some areas in Class III.

Only one KOP was established along Segment I to characterize the potential visual impact of this segment. KOP 24 is located inside Eureka Canyon along the Eureka-Palisade Railroad grade, approximately 900 feet north of the proposed crossing for Segment I. The topography of the landscape undulates from this viewpoint and is enclosed by landforms to the left and right of the viewshed. An existing transmission line is clearly visible in the middleground view against the Richmond Mountains. Tree cover is sparse in the middleground view, but due to the viewing angle, it is moderately dense in the foreground view to the right.

Towers and conductors of Segment I would be highly visible and seen crossing the viewshed in the middleground and foreground views. Due to the nature of the topography, the transmission towers would be located prominently on the landforms and create a strong visual contrast. The strong visual contrast is inconsistent with the objectives to partially retain the existing character of the landscape for Class III areas and results in a high visual impact. Thus, Segment I as seen from KOP 24 is considered a significant visual impact. The project's visual impact on the historic setting of the Eureka-Palisade Railroad is discussed in Section 3.16.3.

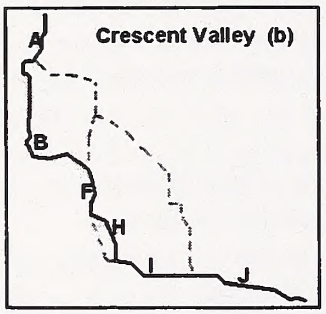
❑ ***Impact Visual-7: Impact of Segment I on VRM Class III Visual Resource***

Segment I as seen from KOP 24 would create a strong visual contrast in the landscape that is inconsistent with the VRM Class III objective of partially retaining the natural character of the landscape resulting in a significant visual impact.

❑ ***Mitigation Measure Visual-7***

Reduce the structural prominence of the towers by minimizing the skylining effect. Design tower locations within design constraints, along the proposed centerline so they are not objectionably situated on the prominent landforms. Implementation of this mitigation measure should reduce the contrast of the transmission line to an acceptable level that is consistent with the VRM Class III objectives.

Crescent Valley (b) Route Alternative



The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segment H instead of Segment G.

Segment H

Segment H is approximately 20 miles in length and would pass to the east of Whistler Mountain on the western edge of Diamond Valley. The lands in this area are primarily open and undeveloped. Portions of Segment H would parallel Highway 278 and would cross over US 50, a designated state Scenic Byway. Segment H would pass through mostly VRM Class IV areas, with the exception for the Class III area bounding the Pony Express Trail in the Garden Pass area and Class II area bounding Anchor Peak and Devil' Gate.

Three KOPs (21-23) were established along Segment H to characterize the potential visual impact of this segment. KOP 21 was established at Tyrone Creek at the Pony Express Trail. KOP 22 was established 0.8 mile east of Devil's Gate on Highway 50 looking eastbound. KOP 23 was established on Highway 50 looking westbound approximately 0.8 mile east of the proposed crossing. KOPs 22 and 23 are located in VRM Class IV areas and are typical views that a viewer driving on US 50 would experience. It is expected the number of viewers in this area would be high due to the state highway status. From KOP 22, the transmission line would be directly visible in the foreground/middleground views against the nearby topographic features. The resulting visual contrast is strong. From KOP 23, Segment H would be seen in the foreground and middleground view against distant mountain backdrops and in front of exiting rural residences/ranches. The resulting visual contrast is strong. Segment H as seen from these two KOPs (22 and 23) would create a strong visual contrast in the landscape designated as VRM Class IV, resulting in a medium visual impact that is not considered significant.

KOP 21 was established on the Pony Express Trail adjacent to Tyrone Creek and 700 feet west of Segment H as it traverses the creek and the trail in the Garden Pass Area. The area has been inventoried and assigned VRM Class III by the BLM. The Pony Express Trail is clearly evident in the foreground view running east toward the horizon. The landscape is undulating with landforms framing the right and left side of the viewshed. A mountain range serves as a backdrop to the viewshed but is very distant in the horizon. The vegetation is composed of low-lying vegetation and low-level trees. Three transmission towers of Segment H would be highly visible, crossing the viewshed in the foreground and middleground view. Due to the low-level trees and prominent landforms, the towers and conductors

would only be partially screened and be visible against the sky, creating a strong visual contrast. The contrast is inconsistent with the management objectives of this area resulting in a high visual impact. Thus, Segment H, as seen from KOP 21, is considered a significant visual impact. The project's visual impact on the historic setting of the Pony Express Trail is provided in Section 3.16.3.

❑ ***Impact Visual-8: Impact of Segment H on VRM Class III Visual Resource***

Segment H as seen from KOP 21 would create a strong visual contrast in the landscape resulting from the towers and conductors prominent visibility against the sky in the immediate foreground view and is inconsistent with the interim VRM Class III objective of partially retaining the natural character of the landscape.

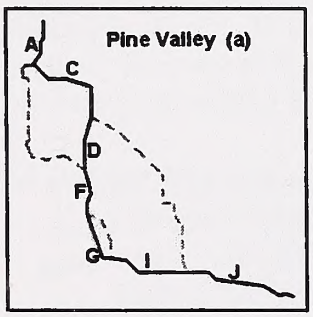
❑ ***Mitigation Measure Visual-8a***

The impacts of Segment H as seen from the KOP 21 cannot be totally mitigated. However, tower placement, reclamation of the centerline travel route or nearby access roads, revegetation, and the minimization of tree trimming should be used to limit visual impacts to the greatest extent possible.

❑ ***Mitigation Measure Visual-8b***

Minimize skylining of tower and conductors and design tower locations within design constraints along the proposed centerline so they are not objectionably situated on prominent landforms.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B.

Segment C

Segment C would be located on open and undeveloped lands. Much of this land is flat, except for those areas where Segment C would pass through the Shoshone Range. The only developments within the Segment C study area are scattered rural residential uses and existing roads. Within the study corridor, the area has been inventoried and classified by the BLM as VRM Class III and IV, with the majority in Class IV. Two KOPs (8 and 9) were established along Segment C to characterize the potential visual impact of this segment. KOP 8 is identical to KOP 2 but with the addition of another view frame to the right. The transmission line is approximately 1.5 miles away from the viewpoint and can be seen against distant and near background topographic features. The transmission line would create a moderate visual contrast in the landscape but is consistent with the VRM Class IV designation resulting in a low visual impact. As with KOP 2, the distance of Segment C (1.5 miles) from KOP 8 would create a moderate visual contrast in the landscape resulting in a low visual impact to this geologic feature. Thus, no significant impact is expected from Segment C within the vicinity of KOP 8.

KOP 9 is located one-tenth of a mile south of the proposed Segment C crossing on Highway 306. The area is primarily flat with distant mountains forming the backdrop. The area is classified as VRM Class IV. Segment C would be visible in the foreground to background view. Certain portions of the transmission line would be visible against the sky in the near foreground views, with a backdrop of distant mountain in other views. Segment C as seen from KOP 9 would create a moderate visual

contrast in a VRM Class IV area, which is consistent with the management objectives. The resulting visual impact is medium and is not considered a significant impact

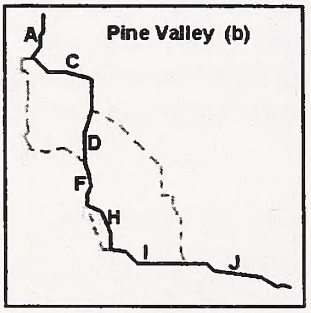
Segment D

Segment D would be located in Pine Valley on primarily open, flat, and sparsely developed lands and is approximately 19 miles in length. Segment D runs parallel to Highway 278 and the historic Eureka - Palisade Railroad grade. At its closest point, Segment D would be within 0.6 mile of the railroad grade. BLM lands in the vicinity of Segment D have been inventoried and are classified as VRM Class IV.

Two KOPs (10-11) were established along Segment D to characterize the potential visual impact of this segment. KOP 10 is located 0.6 mile to the east of Segment D along the Eureka-Palisade Railroad grade. From KOP 10, Segment D would be visible in the middleground view approximately 0.6 mile away and would create a moderate visual contrast against the existing landscape and is consistent with the VRM Class IV objectives. The resulting medium visual impact would not be considered a significant impact. The project's impact on the historic setting of the Eureka-Palisade railroad is discussed in Section 3.16.3.

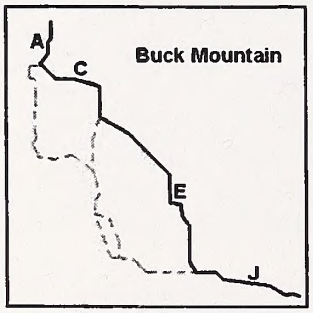
KOP 11 is located at the Highway 278 Rest Area at the juncture of Highway 278 and JD Road. The landscape is primarily flat, with distant mountains serving as a backdrop. There is evidence of a gravel extraction pile, and a wood pole distribution line is visible in the immediate foreground view running west into the distant mountains. Segment D would run perpendicular to the existing utility line and would be visible in the middleground view approximately one-half mile from KOP 11. The transmission line would be backdropped by the mountains, which act to absorb the visual change in the landscape. The transmission line would create a moderate visual contrast consistent with the VRM Class IV objectives for this area. The resulting visual impact would be low and not considered a significant visual impact.

Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west. All of these segments are described above.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J.

Segment E

Segment E is the longest of all the segments, at approximately 75 miles. It would be located on primarily open, flat, and sparsely developed lands. It would also, however, traverse three mountain ranges: Sulphur Mountain, Diamond Mountain, and Buck Mountain. In addition, Segment E would traverse the

Pony Express Trail historic site, which is eligible for listing in the NRHP. VRM Class designations within the study corridor include Class II, III, and IV, with the majority occurring in Class IV. Within the Ely BLM District, VRM Classes have not been established as part of the RMP planning process; therefore, interim VRM Classes have been assigned. The eastern half of Diamond Mountain and the Buck Mountain Range have interim VRM Class III assignment, and the Pony Express Trail has interim VRM Class II assignment.

Six KOPs (12-17) were established along Segment E to characterize the potential visual impact of this segment. The project would create a strong visual contrast in the landscape as viewed from all six KOPs, but 12, 13, 14, and 16 are consistent with the interim and established VRM Classes, resulting in a medium visual impact that would not be considered significant. However, KOPs 12, 15, and 16 require an additional level of analysis due to their proximity to cultural resource sites. The project's visual impact to these cultural resources are evaluated in Section 3.16.3. KOPs 15 and 17 are located in VRM Class II and III, respectively, and are inconsistent with the established management objectives and would result in high visual impacts that are considered significant. These are described below.

KOP 15 is located two-tenths of a mile east of the proposed Segment E at the Pony Express Trail. The trail itself has been widened and bladed and runs east-west toward the distant mountains. The area is relatively flat with low-lying vegetation with ridges on the left and right side framing the viewshed. The Sulphur Mountain Range provides a backdrop in the distant view. Segment E as seen from this KOP would traverse the Pony Express Trail in the foreground and middleground view. From this viewpoint, an angle tower and its conductors would be highly visible and prominently skyline on the ridges to the left. This situation creates a strong contrast in an interim VRM Class II area. The strong contrast created by Segment E conflicts with the management objective of retaining the natural character of the existing landscape. Due to the strong contrast and inconsistency with the management objectives, Segment E as viewed from KOP 15 would create a significant visual impact. The project's visual impact on the historic setting of the Pony Express Trail is evaluated in Section 3.16.3.

❑ ***Impact Visual-9: Impact of Segment E on the VRM Class II Resource***

Segment E as seen from KOP 15 would create a strong visual contrast in the landscape inconsistent with the interim VRM Class II objective of retaining the natural character of the landscape. Therefore, Segment E would create a significant visual impact.

❑ ***Mitigation Measure Visual-9***

The visual effects on a VRM Class II Resource cannot be totally mitigated. The effects can be minimized through strategic placement of angle towers within design constraints along the proposed centerline in a more obscure location relative to the view from KOP 15.

KOP 17 is located approximately 400 feet east of Segment E at Buck Pass. The area is hilly with low-lying vegetation and medium density tree cover. The viewshed is framed by a large landform that starts in the middleground and recedes to the east in the background view. From this viewpoint, Segment E would be visible in the foreground to middleground view and would closely parallel the dirt road. The towers and conductors would be highly visible against the backdrop and would occasionally be visible against the sky, creating a strong contrast in an interim VRM Class III area. The strong contrast is inconsistent with the management objectives for this area and creates a high visual impact that is considered significant.

❑ ***Impact Visual-10: Impact of Segment E on VRM Class III Visual Resource***

Segment E as seen from KOP 17 would create a strong visual contrast in the landscape and is inconsistent with the interim VRM Class III objective of partially retaining the natural character and results in high visual impact that is considered a significant impact.

❑ *Mitigation Measure Visual-10*

The impacts of Segment E as seen from KOP 17 cannot be fully mitigated. However implementing the following measures would minimize the strong contrast effects. Use existing roads for access to tower locations when possible to reduce ground disturbance, and after construction, reclaim access roads to close to pre-existing conditions, except for tree clearance and other access necessary for annual inpections and maintenance.

Summary Comparison of Route Alternatives

TABLE 3.9-3: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Visual-1: Potential Visual Impacts During Construction	X	X	X	X	X
Impact Visual -2: Access Road Impacts	X	X	X	X	X
Impact Visual-3: Visual Impacts Due to Vegetation Removal	X	X	X	X	X
Impact Visual-4: Conflicts with VRM System Goals and Objectives	X	X	X	X	X
Impact Visual-5: Impacts on Occupied Homes	X	X	X	X	X
Impact Visual-6: Impact of Segment B from KOP 5	X	X			
Impact Visual-7: Impact of Segment I on VRM Class III Visual Resource	X	X	X	X	
Impact Visual-8: Impact of Segment H on VRM Class III Visual Resource		X		X	
Impact Visual-9: Impact of Segment E on the VRM Class II Resource					X
Impact Visual-10: Impact of Segment E on VRM Class III Visual Resource					X

Table 3.9-4 summarizes the visual impacts associated with each KOP.

TABLE 3.9-4: SUMMARY OF IMPACTS AT KOPS

Segments	KOPs		VRM Class	Contrast Rating	VRM Visual Impact[1]
A	KOP 1	1-80 Crossing	III	Moderate	Medium
B	KOP 2	Geologic Feature	IV	Moderate	Low/No
	KOP 3	Crescent Valley	IV	Moderate	Low
	KOP 4	Highway 306	IV	Moderate	Low/No
	KOP 5	Geologic Feature	III	Strong	High
	KOP 6	Cortez	III	Low	Low/No
	KOP 7	South of Cortez	III	Moderate	Medium
C	KOP 8	Geologic Feature	IV	Moderate	Low/No
	KOP 9	Highway 306	IV	Strong	Medium
D	KOP 10	Eureka-Palisade RR grade	IV	Moderate	Medium
	KOP 11	Highway 278 Rest Area	IV	Moderate	Low/No
E	KOP 12	Eureka-Palisade RR grade	IV	Strong	Medium
	KOP 13	Highway 278	IV	Strong	Medium
	KOP 14	RR Pass	IV	Strong	Medium
	KOP 15	Pony Express Trail	II	Strong	High
	KOP 16	Warm Springs Ranch	IV	Strong	Medium
	KOP 17	Buck Pass	III	Strong	High
F	KOP 18	Highway 278 at Frasier Creek	IV	Moderate	Low/No
G	KOP 19	Pony Express Trail	IV	Strong	Medium
	KOP 20	Highway 50 at Devil's Gate	IV	Strong	Medium
H	KOP 21	Pony Express Trail	III	Strong	High
	KOP 22	Highway 50 Eastbound	IV	Strong	Medium
	KOP 23	Highway 50 Westbound	IV	Strong	Medium
I	KOP 24	Eureka-Palisade RR grade & Diamond Valley Road	III	Strong	High
J	KOP 25	Ruby Lake Road	III	Moderate	Medium
	KOP 26	Highway 50 at Marking Corral Summit	IV	Moderate	Low/No
	KOP 27	Highway 50 at Robinson Summit	III	Strong	Medium
	KOP 28	Hercules Gap	III	Moderate	Medium
	KOP 29	Highway 93 at Gonder Substation	IV	Low	Low

1 Impact Ratings:

High — *The visual contrast of the project would exceed the VRM Class for an area or conflict with applicable plans and adopted policies of governmental agencies. This is considered a significant impact*

Medium — *The visual contrast of the project would be fully at, but not exceed, the VRM Class guidelines for that area.*

Low/No — *The visual contrast of the project is clearly less than the VRM Class guidelines for the area.*

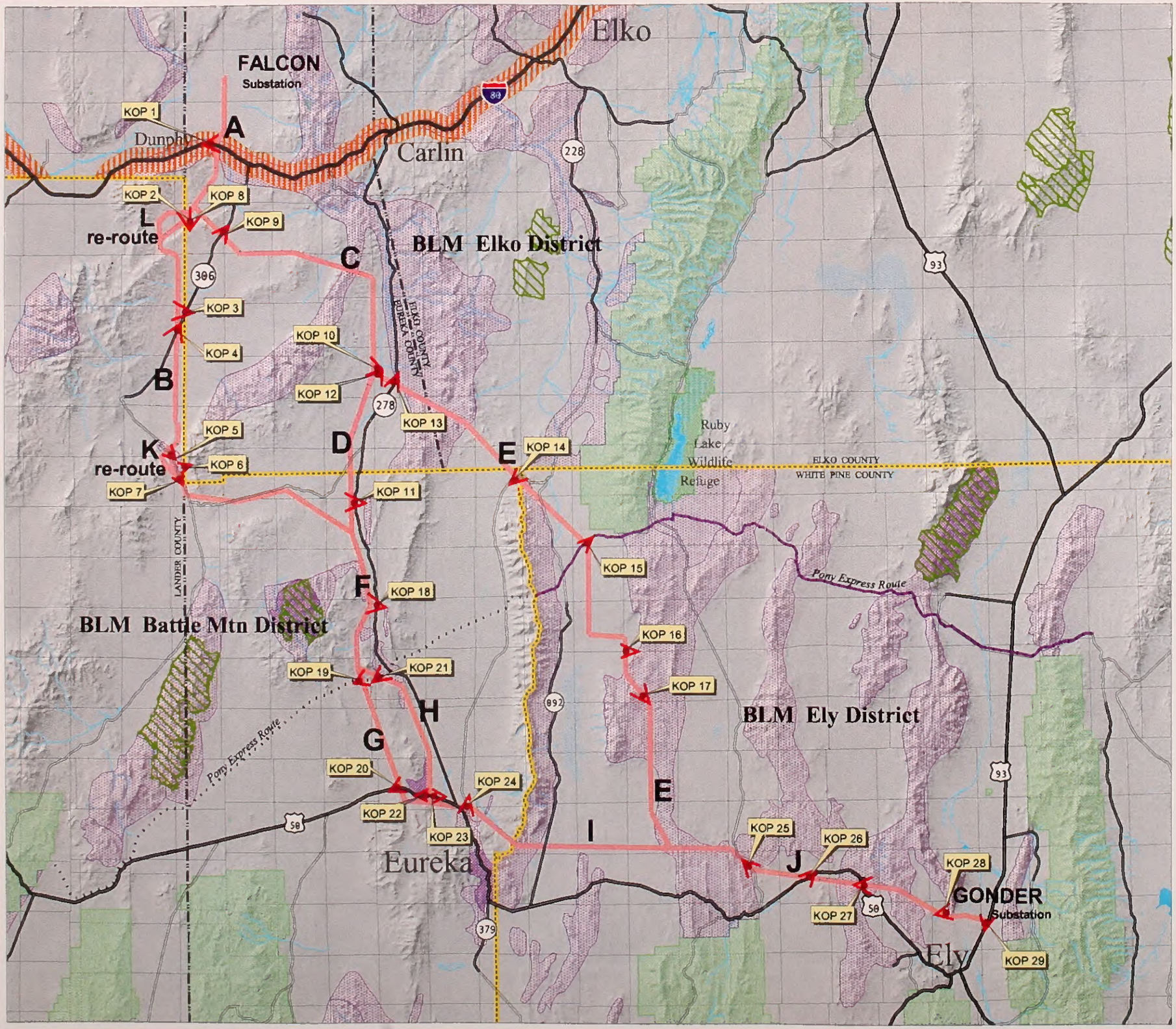
RESIDUAL IMPACTS

After mitigation, there may be residual impacts to visual resources on all route alternatives. The visual impact may conform with the applicable VRM Class objectives, but there is no way to completely eliminate the residual visual impacts of a transmission line.

After the selection of the preferred alternative, a detailed COM Plan would be completed providing site-specific mitigation measures where the project would exceed the VRM Class objective. The COM Plan would also contain monitoring protocols to ensure compliance with the mitigation measures. While re-routing of the transmission line is a preferred mitigation measure, it may be determined that avoidance is infeasible due to engineering constraints, topography, sensitive habitat or other conditions. In this case, SPPC should implement visual design techniques discussed earlier to reduce the overall visual contrast to the extent possible.

NO ACTION ALTERNATIVE

Under the No Action Alternative, visual impacts associated with the project would not occur. However, similar impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.



Sierra Pacific Power Co.

FALCON to GONDER Project

Key Observation Points [KOPs]

KOP with Field of View

VRM Classification

Class III

Class II

Class II
(Pony Express Route in Ely District)

Class IV
(other BLM managed lands)

Low Visibility Corridor
(per Elko RMP)

Other Land Status

US National Forest

BLM Wilderness Study Area

BLM District Boundary

Route Alternatives

Scale 1 : 760,320

Kilometers 5 0 5 10 15 20 25 30

Miles 5 0 5 10 15 20

1" = 12 miles

N

GIS Mapping by EDAW, Inc. – San Francisco 4/25/01

Sources: EDAW, Inc. 2000 / BLM 2000

Figure 3.9 - 1

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Interstate highway travelers, moderate sensitivity to visual quality.
Volume of Users: High
T/L Distance from Viewer: From background to foreground crossing views
T/L Prominence in Landscape: Moderate - T/L will be seen against the sky in foreground views; backdropped by distant landforms elsewhere.
Existing Modifications: Existing wood pole transmission line and distant structures.

Contrast Rating: Moderate
VRM Class: IV
Visual Impact Rating: Medium

KOP 1
I-80 Crossing

Figure 3.9-2

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Note: Proposed transmission line is located on the east side of Whirlwind Valley and is obscured by atmospheric conditions and mountain backdrop.

Summary of Visual Changes

Volume of Users: Low - relatively few
T/L Distance from Viewer: Middleground - approximately one mile
T/L Prominence in Landscape: Low - seen against near to distant landforms
Existing Modifications: Two existing wood pole transmission lines and small building near the proposed T/L location; substantial road cut (behind this viewpoint)

Contrast Rating: Moderate
VRM Class: IV
Visual Impact Rating: Low

KOP 2
Geologic Feature

Figure 3.9-3

Falcon to Gonder Project EIS

Context Photograph

Summary of Visual Changes

Type/Sensitivity of Users: Residential community; high sensitivity to visual quality
Volume of Users: Low - small community
T/L Distance from Viewer: Middleground - one-half to one mile
T/L Prominence in Landscape: Low - closely backdropped by hills
Existing Modifications: Existing wood pole transmission line and scattered residential and ranching structures.

Contrast rating: Moderate
VRM Class: IV
Visual Impact Rating: Medium

KOP 3
Crescent Valley

Figure 3.9-4

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local highway travelers with moderate concern for scenic quality
Volume of Users: Moderate
T/L Distance from Viewer: From background to foreground crossing views
T/L Prominence in Landscape: Moderate - seen primarily against distant landforms but briefly against the sky at the crossing
Existing Modifications: Existing wood pole transmission and distribution lines, various types of buildings and substantial ground disturbance

Contrast Rating: Moderate
VRM Class: IV
Visual Impact Rating: Low

KOP 4
Highway 306

Figure 3.9-5

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local highway travelers and historians/history enthusiasts with a moderate and high degree of interest in the quality of the setting, respectively
Volume of Users: A moderate to low number of highway travelers; few historians
T/L Distance from Viewer: Adjacent to the proposed alignment
T/L Prominence in Landscape: High - a number of the transmission towers will be skylined
Existing Modifications: A small wood pole distribution line

Contrast Rating: Strong
VRM Class: III
Visual Impact Rating: High

KOP 5
Geologic Feature

Figure 3.9-6

Falcon to Gonder Project EIS

Context Photograph

Summary of Visual Changes

Type/Sensitivity of Users: Local residents and history enthusiasts with a high degree of interest in the quality and character of the landscape
Volume of Users: Both types of viewers are relatively few in number
T/L Distance from Viewer: Middleground - approximately one mile
T/L Prominence in Landscape: Low - closely backdropped by the Toiyabe Ridge
Existing Modifications: Primarily small scale historic mining evidence/disturbance

Contrast Rating: Low
VRM Class: III
Visual Impact Rating: Low

KOP 6
Cortez

Figure 3.9-7

Falcon to Gonder Project EIS

Context Photograph
Note: Proposed transmission line will be visible crossing over mountain ridgeline in the middleground view.

Summary of Visual Changes

Type/Sensitivity of Users: Local highway travelers with a moderate interest in visual quality
Volume of Users: A moderate to low number
T/L Distance from Viewer: Middleground and foreground views
T/L Prominence in Landscape: From low to high - closely backdropped by nearby landforms and skylined
Existing Modifications: Wood pole distribution line and minor past mining disturbance

Contrast Rating: Moderate
VRM Class: III
Visual Impact Rating: Medium

KOP 7
South of Cortez

Figure 3.9-8

Falcon to Gonder Project EIS

Context Photograph

Summary of Visual Changes

Type/Sensitivity of Users: Local residents and history enthusiasts with a high degree of interest in the quality and character of the landscape
Volume of Users: Both types of viewers are relatively few in number
T/L Distance from Viewer: Middleground - approximately one mile
T/L Prominence in Landscape: Low - closely backdropped by the Toiyabe Ridge
Existing Modifications: Primarily small scale historic mining evidence/disturbance

Contrast Rating: Low
VRM Class: III
Visual Impact Rating: Low

KOP 6
Cortez

Figure 3.9-7

Falcon to Gonder Project EIS

Context Photograph

Note: Proposed transmission line will be visible crossing over mountain ridgeline in the middleground view.

Summary of Visual Changes

Type/Sensitivity of Users: Local highway travelers with a moderate interest in visual quality
Volume of Users: A moderate to low number
T/L Distance from Viewer: Middleground and foreground views
T/L Prominence in Landscape: From low to high - closely backdropped by nearby landforms and skylined
Existing Modifications: Wood pole distribution line and minor past mining disturbance

Contrast Rating: Moderate
VRM Class: III
Visual Impact Rating: Medium

KOP 7
South of Cortez

Figure 3.9-8

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Note: Transmission line is located on the north side of the valley and is obscured by atmospheric conditions.

Summary of Visual Changes

Volume of Users: Low - relatively few in number
T/L Distance from Viewer: Middleground - approximately one and one-half miles from the viewpoint, but the T/L would have to be crossed to access the KOP
T/L Prominence in Landscape: Low - the transmission line would be seen against distant and near background topographic features
Existing Modifications: Two existing wood pole transmission lines and small building near the proposed T/L location; substantial road cut (behind this viewpoint)

Contrast Rating: Moderate
VRM Class: IV
Visual Impact Rating: Low

KOP 8
Geologic Feature

Figure 3.9-9

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local highway travelers with a moderate interest in the visual quality of the area
Volume of Users: Moderate use
T/L Distance from Viewer: From background to foreground crossing views
T/L Prominence in Landscape: Moderate - seen against the sky at near distances but backdropped by distant mountains in other views
Existing Modifications: None

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 9
Highway 306

Figure 3.9-10

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Historians/history enthusiasts with a high interest in the context of the site
Volume of Users: Few
T/L Distance from Viewer: Middleground - approximately one-half mile
T/L Prominence in Landscape: Moderate - backdropped by distant mountains
Existing Modifications: Essentially none

Contrast Rating: Moderate
VRM Class: IV
Visual Impact Rating: Medium

KOP 10
Eureka-Palisade RR Grade

Figure 3.9-11

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Primarily local highway travelers with moderate sensitivity for visual quality
Volume of Users: Moderate
T/L Distance from Viewer: Middleground - approximately one-half mile
T/L Prominence in Landscape: Low - backdropped by mountain range and lower in landscape position
Existing Modifications: Gravel extraction pile, wood pole distribution line and rest area structures

Contrast Rating: Moderate
VRM Class: IV
Visual Impact Rating: Low

KOP 11
Highway 306

Figure 3.9-12

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Historians and history enthusiasts with a high degree of sensitivity to the context of the site
Volume of Users: Few
T/L Distance from Viewer: From background to foreground crossing views
T/L Prominence in Landscape: High - seen primarily against the sky
Existing Modifications: Essentially none

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 12
Eureka-Palisade RR Grade

Figure 3.9-13

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Primarily local highway travelers with moderate sensitivity to visual quality
Volume of Users: Moderate
T/L Distance from Viewer: From background views to the foreground crossing
T/L Prominence in Landscape: Moderate - seen primarily against distant backdrops but against the sky near the crossing
Existing Modifications: Existing wood pole distribution line and some limited ground disturbance

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 13
Highway 278

Figure 3.9-14

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local travelers and recreationists with a moderate degree of interest in the visual quality of the setting
Volume of Users: Relatively few viewers
T/L Distance from Viewer: From middleground views to the foreground crossing
T/L Prominence in Landscape: High - the adjacent towers crossing the road are prominently skylined on ridgetops
Existing Modifications: Essentially none

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 14
Railroad Pass

Figure 3.9-15

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local travelers and history enthusiasts with a moderate to high degree of interest respectively in the visual setting of the trail
Volume of Users: Relatively few
T/L Distance from Viewer: From background to foreground crossing views
T/L Prominence in Landscape: High - angle towers would be set on adjacent, locally prominent ridges
Existing Modifications: Windmill

Contrast Rating: Strong
VRM Class: II (Interim)
Visual Impact Rating: High

KOP 15
Pony Express Trail

Figure 3.9-16

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Ranch residents with a high degree of interest in the surroundings of their home
Volume of Users: One ranch
T/L Distance from Viewer: In the foreground of the ranch house with a crossing over the drive
T/L Prominence in Landscape: High - foreground views create skylining conditions
Existing Modifications: Ranch related buildings

Contrast Rating: Strong
VRM Class: IV (Interim)
Visual Impact Rating: Medium

KOP 16
Warm Springs Ranch

Figure 3.9-17

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local travelers and recreationists with a moderate interest in the visual quality of the setting
Volume of Users: Relatively few
T/L Distance from Viewer: Middleground to foreground crossing views
T/L Prominence in Landscape: High - the transmission line would closely parallel the road through this range and be seen under a variety of near-backdropped to skylined settings
Existing Modifications: Essentially none

Contrast Rating: Strong
VRM Class: III (Interim)
Visual Impact Rating: High

KOP 17
Buck Pass

Figure 3.9-18

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Note: Transmission line is located against mountain backdrop and obscured by the dark background.

Summary of Visual Changes

Type/Sensitivity of Users: Local highway travelers with a moderate concern for scenic quality
Volume of Users: Moderate
T/L Distance from Viewer: Primarily foreground (less than one-half mile) and middleground views
T/L Prominence in Landscape: Low - seen against the near backdrop of the Roberts Mountains
Existing Modifications: Essentially none

Contrast Rating: Moderate
VRM Class: IV
Visual Impact Rating: Low

KOP 18
Hwy 278 at Frasier Creek

Figure 3.9-19

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: History enthusiasts and recreationists with a high degree of interest in the context of the setting
Volume of Users: Few
T/L Distance from Viewer:Foreground views are briefly visible to eastbound riders as well as from the point of crossing
T/L Prominence in Landscape: High for eastbound riders
Existing Modifications: Essentially none

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 19
Pony Express Trail

Figure 3.9-20

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Long distance and local highway travelers with a moderate interest in the scenic quality
Volume of Users: High
T/L Distance from Viewer: Middleground to foreground crossing views
T/L Prominence in Landscape: Moderate to low - primarily seen against nearby hills, but skylined in near views
Existing Modifications: Small gravel/mining operation to the south of the highway crossing

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 20
Hwy 50 Devil's Gate

Figure 3.9-21

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: History enthusiasts and other recreationists with a high degree of interest in the context of the surroundings
Volume of Users: Few
T/L Distance from Viewer: Middleground to foreground views
T/L Prominence in Landscape: High
Existing Modifications: Essentially none

Contrast Rating: Strong
VRM Class: III
Visual Impact Rating: High

KOP 21
Pony Express Trail

Figure 3.9-22

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local and long distance travelers with a moderate sensitivity to scenic quality of the area
Volume of Users: High
T/L Distance from Viewer: Middleground to foreground crossing views
T/L Prominence in Landscape: Moderate - seen against a distant mountain range
Existing Modifications: Widely scattered rural residences/ranches in the distance

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 22
Highway 50 Eastbound

Figure 3.9-23

Falcon to Gonder Project EIS

Context Photograph

Summary of Visual Changes

Type/Sensitivity of Users: Local and distant highway travelers with a moderate interest in the visual quality
Volume of Users: High
T/L Distance from Viewer: Middleground to foreground crossing views
T/L Prominence in Landscape: Moderate to low - seen against nearby topographic features
Existing Modifications: Essentially none

Contrast Rating: Strong
VRM Class: IV
Visual Impact Rating: Medium

KOP 23
Highway 50 Westbound

Figure 3.9-24

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Historians and history enthusiasts with a high degree of interest in the visual setting of the railroad
Volume of Users: Few
T/L Distance from Viewer: Middleground to foreground crossing views
T/L Prominence in Landscape: High - prominently set on the tops of the enclosing landforms
Existing Modifications: Two existing wood pole transmission lines cross the railroad route approximately 1000 feet to the south

Contrast Rating: Strong
VRM Class: III
Visual Impact Rating: High

KOP 24
Eureka-Palisade RR Grade

Figure 3.9-25

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local travelers and recreation users with a moderate interest in the visual quality of the landscape
Volume of Users: Few
T/L Distance from Viewer: Background to foreground crossing views
T/L Prominence in Landscape: Moderate - generally backdropped except for near distance skylining
Existing Modifications: An existing wood pole transmission line

Contrast Rating: Moderate
VRM Class: III (Interim)
Visual Impact Rating: Medium

KOP 25
Ruby Lake Road

Figure 3.9-26

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Local and long distance highway travelers with a moderate interest in the visual quality of the area
Volume of Users: High
T/L Distance from Viewer: Background to foreground crossing views
T/L Prominence in Landscape: Moderate - generally backdropped
Existing Modifications: Existing wood pole transmission line

Contrast Rating: Moderate
VRM Class: IV (Interim)
Visual Impact Rating: Low

KOP 26
Hwy 50 Marking Corral

Figure 3.9-27

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Note: This alignment is located in a designated utility corridor.

Summary of Visual Changes

Type/Sensitivity of Users: Local and long distance travelers with a moderate interest in the visual quality of the area
Volume of Users: High
T/L Distance from Viewer: Middleground to foreground crossing views
T/L Prominence in Landscape: Moderate to high - partially backdropped but some towers prominently skylined on nearby ridges
Existing Modifications: Existing wood pole transmission line

Contrast Rating: Strong
VRM Class: III (Interim)
Visual Impact Rating: Medium

KOP 27
Hwy 50 Robinson Summit

Figure 3.9-28

Falcon to Gonder Project EIS

Existing Conditions

Future Conditions

Summary of Visual Changes

Type/Sensitivity of Users: Residents, recreationalists
Volume of Users: Few
T/L Distance from Viewer: Middleground
T/L Prominence in Landscape: High - a tower is prominently located on the ridge top
Existing Modifications: An existing wood pole transmission line is located approximately 100 feet to the south of the proposed crossing; a number of scattered residences are located within view of the area

Contrast Rating: Moderate
VRM Class: III (Interim)
Visual Impact Rating: Medium

KOP 28
Hercules Gap

Figure 3.9-29

Falcon to Gonder Project EIS

Context Photograph

Summary of Visual Changes

Type/Sensitivity of Users: Local and long distance travelers with a moderate concern for visual quality
Volume of Users: High
T/L Distance from Viewer: Background to foreground crossing views
T/L Prominence in Landscape: Low - seen in a valley situation with topographic backdrops except at close distances
Existing Modifications: The Gonder substation is located adjacent to the highway with numerous transmission lines converging from various locations

Contrast Rating: Low
VRM Class: IV (Interim)
Visual Impact Rating: Low

KOP 29
Gonder Substation

Figure 3.9-30

Falcon to Gonder Project EIS

3.10 PUBLIC HEALTH AND SAFETY (HAZARDOUS MATERIALS, FIRE MANAGEMENT AND EMF)

This section examines potential public health and safety impacts that could be associated with the Falcon to Gonder project, specifically, those related to hazardous materials, fire management, and electric and magnetic fields (EMF).

3.10.1 AREA OF ANALYSIS AND METHODOLOGY

The area of analysis is comprised of a 500-foot wide study corridor along the route alternatives (i.e., 250 feet on each side of the centerline). The methodology for analyzing impacts included identifying general types of hazardous materials and techniques that are likely to be used during project construction, operation, and maintenance. For fire management, activities and equipment that could pose fire hazards were evaluated. The methodology for evaluating EMF and electrical effects associated with operation of the 345 kV electric power facilities are described in detail in the following sections.

REGULATORY FRAMEWORK

Fire Management Regulations

This project would be subject to state, county, and federally enforced laws, ordinances, rules, and regulations that pertain to prevention and suppression of fire activities.

Hazardous Materials Laws

Use, storage, and disposal of hazardous materials are regulated by numerous local, state, and federal laws. Existing laws that SPPC would be required to comply with for the Falcon to Gonder project include,.but are not limited to, local emergency planning laws and programs; U.S. Department of Transportation regulations related to the transport of hazardous substances; the Resource Conservation and Recovery Act (RCRA); Toxic Substances Control Act; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); Superfund Amendments and Reauthorization Act (SARA); Emergency Planning and Community Right-to-Know Act; Clean Water Act; Clear Air Act; BLM W.O. IM-93-344; and 40 CFR 260-302.

EMF and Transmission Line Electric Safety Guidelines and Regulations

Health and safety guidelines and regulations related to high-voltage transmission lines are provided in a number of sources, including the National Electrical Safety Code, American National Standards Institute, American Medical Association Council on Scientific Affairs, American Conference of Governmental Industrial Hygienists, various state regulations, and other organizations as discussed below.

3.10.2 AFFECTED ENVIRONMENT

FIRE MANAGEMENT

The project would be located in a region susceptible to large-scale wildfires. In the summer of 1999, Nevada experienced one of the worst fire seasons since the 1940s. More than 1.5 million acres were burned. Figure 3.4-1 in Section 3.4, Vegetation, shows areas in the project area that were burned in 1999 and 2000. These locations were generally dominated by undisturbed native vegetation prior to the burn, as noted during vegetation surveys that were conducted for this project (SEI and Tetra Tech EMI 2000). However, native plant communities have become increasingly invaded by non-native vegetation, primarily cheatgrass (*Bromus tectorum*). Replacement of native vegetation by non-native vegetation,

primarily cheatgrass, has been identified as a prime contributor to an increase in the frequency and severity of wildfires in the project area.

The movement of cheatgrass and other introduced species into Great Basin plant communities and the increased frequency and extent of wildfires have resulted in substantial economic and environmental harm, along with increased safety risks to people, wildlife, and domestic animals. For additional discussion of this issue, please see Section 3.4, Vegetation.

HAZARDOUS MATERIALS

The project would be located in an area that is largely open space, public and private land used for grazing, mining, agriculture and recreational activities. The project area is very sparsely populated with only a few rural ranch houses, mobile homes, and trailers near the transmission line route alternatives that could potentially be exposed to hazardous materials associated with project construction and operation (see also Section 3.13, Land Use). The nearest towns are Ely, Eureka, and Crescent Valley.

ELECTRIC AND MAGNETIC FIELDS

This section provides an overview of electric and magnetic fields (EMF) and describes some of the typical public health issues related to transmission lines. An evaluation of potential health and safety impacts from the proposed Falcon to Gonder transmission line follows.

Electric Fields Overview

EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field). The potential or voltage (electrical pressure) on an object causes electric fields. Any object with an electric charge on it has a voltage (potential) at its surface, caused by the accumulation of more electrons on that surface as compared with another object or surface. The voltage effect is not limited to the surface of the object but exists in the space surrounding the object in diminishing intensity. Electric fields can exert a force on other electric charges at a distance. The change in voltage over distance is known as the electric field. The units describing an electric field are volts per meter (V/m) or kilovolts per meter (kV/m). This unit is a measure of the difference in electrical potential or voltage that exists between two points one meter apart. The electric field becomes stronger near a charged object and decreases with distance away from the object.

Electric fields are a very common phenomenon. Static electric fields can result from friction generated when taking off a sweater or walking across a carpet. Body voltages have been measured as high as 16,000 volts due to walking on a carpet (Chakravarti 1976). The earth creates a natural static field in fair weather that is due to the 300,000 to 400,000 volt potential difference between the ionosphere and the surface of the earth (Veimeister 1972). At ground level, the mean value of the earth's electric field is approximately 120 V/m. This means that a 6-foot tall person would have a static potential of about 220 volts between the top and bottom of their body.

The normal fair weather static electric field of the earth varies from month to month, reaching a maximum of about 20% above normal in January, when the earth is closest to the sun, and falling to about 20% below normal by July, when the earth is farthest from the sun. Much stronger static electric potentials can exist underneath storm clouds, where the electric potential with respect to earth can reach 10 to 100 million volts (Veimeister 1972). Natural static electric fields under clouds and in dust storms can reach 3 to 10 kV/m (CRC 1981).

All household appliances and other devices that operate on electricity create electric fields. However, these fields are different from the earth's static or direct current (DC) field. Fields produced by electrical

appliances that use alternating current (AC) reverse direction at a frequency of 60 cycles per second (60 Hertz, or Hz). The electric field in this case is caused by the changing electric voltage in the appliance. The magnitude of the electric field decreases rapidly with distance from the device. The field caused by point source (compact, small-dimension) household appliances generally attenuates more rapidly with distance than line source fields (such as from transmission lines). Appliances need not be in operation to create an electric field. Just plugging an appliance into an electrical outlet creates an electric field around it. Typical values of electric field measured one foot away from some common appliances are shown in Table 3.10-1.

TABLE 3.10-1: TYPICAL ELECTRIC FIELD VALUES FOR APPLIANCES (AT 12 INCHES)

Appliance	Electric Field- kV/m
Electric Blanket	0.25 *
Broiler	0.13
Stereo	0.09
Refrigerator	0.06
Iron	0.06
Hand Mixer	0.05
Phonograph	0.04
Coffee Pot	0.03

** Note: 1 to 10 kV/m next to blanket wires*
Source: Carstensen 1985, Enertech Consultants 1985

Transmission Lines

Electric power transmission lines create 60 Hz electric fields. These fields result from the voltage of the transmission line phase conductors with respect to the ground. Electric field strengths from a transmission line decrease with distance away from the outermost conductor, typically at a rate of approximately one divided by the distance squared ($1/d^2$). As an example, in an unperturbed field, if the electric field strength is 10 kV/m at a distance of one meter away, it would be approximately 2.5 kV/m at 2 meters away and 0.625 kV/m at 4 meters away. In contrast, the electric field strength from a single conductor typically decreases at a rate of approximately one divided by the distance ($1/d$). For example, an electric field strength of 10 kV/m at 1 meter away would decrease to approximately 5 kV/m at 2 meters away, and 2.5 kV/m at 4 meters away. Electric field strengths for a transmission line remain nearly constant over time because the voltage of the line is kept within bounds of about ±5% of its rated voltage. Transmission line electric fields are affected by the presence of grounded and conductive objects. Trees and buildings, for example, can significantly reduce ground level electric fields by shielding the area nearby (Deno 1987).

Substations

Electric power substations also create electric fields due to voltage on station components. The equipment, or components of a substation, acts as point-sources of an electric field, similar to appliances in a home. As the distance from these point sources becomes greater than the physical size of the equipment acting as a source, the field is greatly reduced; this is also true for substation components, such as buswork. The electric fields of station equipment (transformers, circuit breakers, etc.) decrease external to a substation at a rate of approximately one divided by the distance cubed ($1/d^3$), unless an overhead transmission line is nearby. For example, a field of 10 kV/m at one meter away would be approximately 1.25 kV/m at 2 meters away, and 0.156 kV/m at 4 meters away. This contrasts with the linear or line-source characteristics of transmission lines that decrease as approximately one divided by the distance squared ($1/d^2$). Substation electric fields outside the fenced equipment area are typically very low because of shielding by metallic substation components themselves, as well as by the metal fencing

surrounding the substation. Additional shielding is sometimes provided by nearby shrubbery and trees (Deno 1987).

Magnetic Fields Overview

An electric current flowing in a conductor (electric equipment, household appliance, power circuits, etc.) creates a magnetic field. The most commonly used magnetic field intensity unit of measure is the gauss (G). For most practical applications, the gauss is too large, so a much smaller unit, the milligauss (mG), is used for reporting magnetic field magnitudes. The milligauss is one thousandth of a gauss. As a general reference, the earth has a natural static or DC magnetic field of about 0.540 gauss, or 540 mG, in central Nevada (Merrill 1983:20). As with electric fields, the magnetic fields from electric power facilities and appliances differ from static (or DC) fields because they are caused by the flow of 60 Hz alternating currents. Power frequency magnetic fields also reverse direction at a rate of 60 cycles per second, corresponding to the 60 Hz operating frequency of the power systems in the United States.

Since the magnetic field is caused by the flow of an electric current, a device must be operated to create a magnetic field. Magnetic field strengths of a large number of common household appliances were measured by the Illinois Institute of Technology Research (IITRI) for the U.S. Navy (Gauger 1985), and by Enertech Consultants for the Electric Power Research Institute (EPRI) (Silva 1989). Typical magnetic field values for some appliances are presented in Table 3.10-2 to facilitate a better understanding of magnetic field strength values.

TABLE 3.10-2: MAGNETIC FIELDS FROM HOUSEHOLD APPLIANCES

	MAGNETIC FIELD (MG)	
Appliance	12" Away	Maximum
Electric Range	3 to 30	100 to 1,200
Electric Oven	2 to 25	10 to 50
Garbage Disposal	10 to 20	850 to 1,250
Refrigerator	0.3 to 3	4 to 15
Clothes Washer	2 to 30	10 to 400
Clothes Dryer	1 to 3	3 to 80
Coffee Maker	0.8 to 1	15 to 250
Toaster	0.6 to 8	70 to 150
Crock Pot	0.8 to 1	15 to 80
Iron	1 to 3	90 to 300
Can Opener	35 to 250	10,000 to 20,000
Mixer	6 to 100	500 to 7,000
Blender, Popper, Processor	6 to 20	250 to 1,050
Vacuum Cleaner	20 to 200	2,000 to 8,000
Portable Heater	1 to 40	100 to 1,100
Fans/Blowers	0.4 to 40	20 to 300
Hair Dryer	1 to 70	60 to 20,000
Electric Shaver	1 to 100	150 to 15,000
Color TV	9 to 20	150 to 500
Fluorescent Fixture	2 to 40	140 to 2,000
Fluorescent Desk	6 to 20	400 to 3,500
Circular Saws	10 to 250	2,000 to 10,000
Electric Drill	25 to 35	4,000 to 8,000

There are many sources of magnetic fields encountered in everyday activities. Two major research projects have been done to estimate public exposure to ambient 60 Hz magnetic fields. This work was

done to identify typical levels encountered by people inside homes and elsewhere. In the first study, a large number of residences located throughout the United States were measured to determine the sources and characteristics of residential magnetic fields (Enertech 1993). Table 3.10-3 summarizes the results of spot (point-in-time) magnetic field measurements made in the rooms of almost 1,000 residences. The average measured value for all rooms in this study was 0.9 mG.

Another comprehensive study of contemporary magnetic field exposure was recently performed for the U.S. Department of Energy (Enertech 1998). The objective of this work was to characterize personal magnetic field exposure of the general population. This was accomplished by randomly selecting over 1,000 people throughout the United States and recruiting these people to wear a recording magnetic field meter during a typical 24-hour period, including all activity inside and away from the place of residence (Silva 1999). The study population was selected in a manner to be representative of the general population. The measurement population (both genders) included about 874 adults and 138 children. The U.S. 24-hour average for all people in this study was 1.25 mG. Tables 3.10-4 and 3.10-5 summarize results for fractions of the U.S population that exceed selected magnetic field levels and the exposure levels measured for different occupations.

TABLE 3.10-3: SUMMARY OF SPOT ROOM MEASUREMENTS IN THE UNITED STATES (992 RESIDENCES)- MG

Values Exceeded in:	ALL ROOMS				
	Median	Average	Kitchen	Bedroom(s)	Highest Room *
50 % of residences	0.5	0.6	0.7	0.5	1.1
25 % of Residences	1.0	1.1	1.2	1.0	2.1
10 % of Residences	1.7	2.1	2.4	2.0	3.8
5 % of Residences	2.6	3.0	3.5	2.9	5.6
1 % of Residences	5.8	6.6	6.4	7.7	12.2

** Any room in which spot field measurement had the highest value*

TABLE 3.10-4: PERCENTAGE OF U.S. POPULATION WITH AVERAGE FIELD EXPOSURE EXCEEDING GIVEN VALUES

24-Hr Field	Est. Portion	95% Confidence Interval	Population Range
> 0.5 mG	76.3%	73.8 % - 78.9 %	197 - 211 million
> 1 mG	43.6%	41 % - 46.5 %	109 - 124 million
> 2 mG	14.3%	11.9 % - 17.2 %	31.8 - 45.9 million
> 3 mG	6.3%	4.8 % - 8.3 %	12.8 - 22.2 million
> 4 mG	3.35%	2.4 % - 4.7 %	6.4 - 12.5 million
> 5 mG	2.42%	1.67 % - 3.52 %	4.5 - 9.4 million
> 10 mG	0.43%	0.21 % - 0.90 %	0.56 - 2.4 million
> 15 mG	0.1%	0.02 % - 0.55 %	50 thousand - 1.5 million

TABLE 3.10-5: AVERAGE MAGNETIC FIELD EXPOSURE DURING WORK FOR DIFFERENT OCCUPATIONS

Occupation	n	Avg. Field At Work
Managerial, professional, specialty	204	1.64 mG
Technical, sales, administrative, support	166	1.58 mG
Service: Protective, food, health, cleaning	71	2.74 mG
Farming, forestry, fishing	19	0.91 mG
Precision production, craft, repair, operators, fabricators, laborers	128	1.73 mG
Electrical	16	2.15 mG

Transmission Lines

60 Hz transmission line magnetic fields are generated by the current flowing on the phase conductors. Similar to the electric field, field strengths decrease with distance away from the line. Unlike electric fields that vary little over time, magnetic fields are not constant over time because the current on any transmission line changes in response to increasing and decreasing electrical load.

Substations

Electric power substations also create magnetic fields due to current flow on station components. Because a substation is a collection of components that can each be a magnetic field source, a substation complex is often treated as a single point-source for external field measurements taken at a distance. External magnetic fields associated with the substation (e.g., the collection of equipment or components) can be considered separately from the magnetic fields associated with the transmission lines that serve the substation. The manner in which substation component magnetic fields attenuate with distance is similar to that of appliances, where the field strengths diminish rapidly as the distance from the source grows larger than the dimensions of the source itself (for example, a transformer). Therefore, at distances on the order of 50 feet or more from the substation fence, the external magnetic field would have decreased to a much lower level than the level inside the substation. In contrast to electric fields, the substation magnetic fields are not affected significantly (shielded) by most common objects.

Induced Currents

Electric currents can be induced by electric and magnetic fields in conductive objects near to transmission lines. For magnetic fields, the concern is for very long objects parallel and close to the line. The majority of concern is about the potential for small electric currents to be induced by electric fields in metallic objects close to transmission lines. Metallic roofs, vehicles, vineyard trellises, and fences are examples of objects that can develop a small electric charge in proximity to high voltage transmission lines. Object characteristics, degree of grounding, and electric field strength affect the amount of induced charge. An electric current can flow when an object has an induced charge and a path to ground is presented. The amount of current flow is determined by the impedance of the object to ground and the voltage induced between the object and ground. The amount of induced current that can flow is important to evaluate because of the potential for nuisance shocks to people and the possibility of other effects, such as fuel ignition.

The amount of induced current can be used to evaluate the potential for harmful or other effects. Previous work on appliance leakage current can provide some insight into this issue. Leakage (and induced) current is commonly measured in units of milliamperes, mA (i.e., one mA is 0.001 amperes of electric current). Most appliances have a leakage current that flows through the body of the user.

Usually, the amount of current is very small and is below the threshold of perception. Many factors affect how much current flows. In addition to appliance design and age, contact resistance and insulation from ground affect the magnitude of current that flows through the user.

Appliance leakage currents have been measured for a variety of appliances, with levels ranging from 0.002 mA to tens of mA (Kahn 1966, Stevenson 1973). There is a U.S. standard for the leakage current from appliances that was developed to minimize the potential for electric shock hazards and sudden involuntary movements that might result in an accident (ANSI 1992). The standard limits appliance leakage current to 0.5 mA for portable appliances and 0.75 mA for stationary or fixed appliances. The standard was developed with consideration of the variable threshold of human perception of electric current.

Different people and different situations produce a range of current perception values. As an example, when an average person grips an energized conductor, the median (50-percentile) threshold for perception of an AC electric current is 0.7 mA for women and 1.1 mA for men (Dalziel 1972, EPRI 1982). If the current is gradually increased beyond a person's perception threshold, it becomes bothersome, and possibly startling. With sufficiently large currents, the muscles of the hand and arm involuntarily contract and a person cannot release the gripped object. The reasonably safe value at which 99.5% can let-go (0.5% cannot) is 9 mA for men and 6 mA for women (Bridges 1985:10). An equivalent let-go value of 5 mA has been estimated for children (EPRI 1982:377).

However, before the current flows in a shock situation, contact must be made, and in the process of establishing contact a small arc occurs. This causes a withdrawal reaction that, in some cases, may be a hazard if the involuntary nature of the reaction causes a fall or other accident. Consideration of let-go currents was the basis for the National Electric Safety Code (NESC) to set an induced current limit of 5 mA for objects under transmission lines (ANSI 1996:72-73).

HUMAN HEALTH STUDIES

Over the past two decades or so, there has been significant concern over the potential for exposure to EMF to adversely affect human health. There have been a variety of health concerns that included a variety of diseases and other health endpoints, such as reproductive outcome. The possible effect of EMF on human health was originally focused on electric fields, but much of the recent research has focused on magnetic fields. Some of the initial concern was raised by studies done in Denver that reported a positive association between cancer incidence and homes that were near certain transmission line configurations that were thought to produce high levels of magnetic fields (Wertheimer 1979, 1981). Since then, much research has been done to evaluate the potential for EMF exposure to affect human health.

Some of these studies have generally found no conclusive evidence of harmful effects from typical transmission line and substation electric and magnetic fields. However, some studies during this period did report the potential for harmful effects to humans. Complicating resolution of this issue is the lack of knowledge as to what characteristics of electric and magnetic field exposure (if any) need to be considered to assess human exposure effects. The exposure most often considered is intensity or magnitude of the field. There is a consensus among the medical and scientific communities that there is insufficient evidence to conclude that EMF causes adverse health effects. Neither the medical nor scientific communities have been able to provide any foundation upon which federal or state regulatory bodies could establish a standard or limit for exposure that is known to be either safe or harmful.

There is a large body of EMF health literature. Perhaps the best way to evaluate the potential for EMF exposure to affect human health is to consider some of the extensive scientific literature reviews of the

extant research conducted by independent reviewer committees. The Oak Ridge Associated Universities (ORAU) established a panel, at the request of the Committee on Interagency Radiation Research and Policy Coordination, to perform an independent scientific review and evaluate the reported health hazards of exposure to extremely low frequency electric and magnetic fields. The panel reviewed about 1,000 journal articles published within the last 15 years. The ORAU panel completed their EMF literature review and published a report (ORAU 1992).

In the conclusions to the report, the authors state (ORAU 1992: VIII-10-10-11-11):

> This review indicates that there is no convincing evidence in the published literature to support the contention that exposures to extremely low-frequency electric and magnetic fields (ELF-EMF) generated by sources such as household appliances, video display terminals, and local power lines are demonstrable health hazards.

It says later in the report:

> Although exposure to ELF-EMF does not appear to constitute a public health problem, there is evidence that these fields may produce some biological effects, such as changes in the pattern of secretion of the hormone melatonin and enhancement of healing of bone fractures. These findings and those described elsewhere in this report suggest areas of some scientific interest and warrant consideration for further research.

The report concludes with:

> This review does not provide justification for a major expansion of the national research effort to investigate the health effects of ELF-EMF. In the broad scope of research needs in basic science and health research, any health concerns over exposures to ELF-EMF should not receive a high priority.

American Medical Association (AMA)

The AMA adopted recommendations of its Council on Scientific Affairs (CSA) regarding EMF health effects. The report was prepared as a result of a resolution passed at the 1993 annual meeting. The following statements were adopted and are based on the CSA's review of EMF epidemiologic and laboratory studies to date, as well as on several major literature reviews (AMA 1994:12):

- That no scientifically documented health risk has been associated with the usually occurring levels of electromagnetic fields; nevertheless, the American Medical Association (AMA) should continue to monitor developments and issues related to the subject.
- That the AMA should encourage research efforts sponsored by agencies such as the National Institutes of Health, the U.S. Department of Energy, and the National Science Foundation to continue on exposures to electromagnetic fields and their effects, average public exposures, occupational exposures, and the effects of field surges and harmonics.
- That the AMA should support the meeting of an authoritative, multidisciplinary committee under the auspices of the National Academy of Sciences or the National Council on Radiation Protection and Measurements to make recommendations about exposure levels of the public and workers to electromagnetic fields and radiation.

American Cancer Society

In the journal, *A Cancer Journal for Clinicians*, the American Cancer Society (ACS) reviewed EMF residential and occupational epidemiologic research in an article written by Dr. Clark W. Heath, Jr., ACS's vice president of epidemiology and surveillance research. Dr. Heath reviews 13 residential epidemiologic studies of adult and childhood cancer and reported the following (ACS 1996:42):

> The weakness and inconsistent nature of epidemiologic data, combined with the continued dearth of coherent and reproducible findings from experimental laboratory research, leave one uncertain and rather doubtful that any real biological link exists between EMF exposure and carcinogenicity.

National Institute of Environmental Health Sciences

The federal government has recently completed a $60 million EMF research program managed by the National Institute of Environmental Health Sciences (NIEHS) and the U.S. Department of Energy (DOE). This comprehensive EMF research program was called EMF RAPID (Research and Public Information Dissemination) Program. At the conclusion of this major effort, the NIEHS submitted a report to the U.S. Congress on their findings (NIEHS 1999).

Among other things, the NIEHS concluded that:

> The NIEHS believes that the probability that ELF-EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal, scientific support that exposure to this agent is causing any degree of harm. (NIEHS 1999:36).

The NIEHS report also included the following conclusions:

> Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiological findings. (NIEHS 1999:ii).
>
> The NIEHS agrees that the associations reported for childhood leukemia and adult chronic lymphocytic leukemia cannot be dismissed easily as random or negative findings. The lack of positive findings in animals or in mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but cannot completely discount the finding. The NIEHS also agrees with the conclusion that no other cancers or non-cancer health outcomes provide sufficient evidence of a risk to warrant concern. (NIEHS 1999:36).
>
> The National Toxicology Program routinely examines environmental exposures to determine the degree to which they constitute a human cancer risk and produces the 'Report on Carcinogens' listing agents that are 'known human carcinogens' or 'reasonably anticipated to be human carcinogens.' It is our opinion that based on evidence to date, ELF-EMF exposure would not be listed in the 'Report on Carcinogens' as an agent 'reasonably anticipated to be a human carcinogen.' This is based on the limited epidemiological evidence and the findings from the EMF-RAPID Program that did not indicate an effect of ELF-EMF exposure in experimental animals or a mechanistic basis for carcinogenicity. (NIEHS 1999:37).
>
> The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. We also encourage technologies that lower exposures from neighborhood distribution lines provided that they do not increase other risks, such as those from accidental electrocution or fire. (NIEHS 1999:37-38).

ELECTRIC AND MAGNETIC FIELD STANDARDS

EMF Standards

A number of states have set some type of electric or magnetic field limit. In addition, other organizations have established field exposure standards or guidelines. Existing EMF guidelines or limits are summarized in Tables 3.10-6 through 3.10-8.

Corona Effects

One of the phenomenon associated with all energized electrical devices, including high-voltage transmission lines, is corona. Under certain conditions, the localized electric field near an energized conductor can be sufficiently concentrated to ionize air close to the conductors (EPRI 1982:169). This can result in a partial discharge of electrical energy called a corona discharge, or corona. Several factors, including conductor voltage, shape and diameter, and surface irregularities such as scratches, nicks, dust, or water drops, can affect a conductor's electrical surface gradient and its corona performance.

Corona is the physical manifestation of energy loss and can transform discharge energy into very small amounts of sound, radio frequency noise, heat, and chemical reactions of the air components. Corona activity on 345 kV transmission lines in foul weather conditions can produce very tiny amounts of visible light. This light is very difficult to see, but on dark rainy nights it may be occasionally observed close to the line. There are no standards for visible light from transmission lines. This is because the amount of light produced by corona activity is insignificant. The intensity of light is very dim and is not enough to illuminate the landscape.

TABLE 3.10-6: STATE REGULATIONS FOR TRANSMISSION LINE FIELDS

State	Field Limit
Montana	1 kV/m at edge of right-of-way (in residential areas)
Minnesota	8 kV/m maximum on right-of-way
New Jersey	3 kV/m at edge of right-of-way
New York	1.6 kV/m at edge of right-of-way
	200 mG at edge of right-of-way
North Dakota	9 kV/m maximum on right-of-way
Oregon	9 kV/m maximum on right-of-way
Florida	10 kV/m for 500 kV Lines- maximum on right-of-way
	2 kV/m for 500 kV Lines- at edge of right-of-way
	8 kV/m for 230 kV and smaller Lines- maximum on right-of-way
	2 kV/m for 230 kV and smaller Lines- at edge of right-of-way
	200 mG for 500 kV Lines- at edge of right-of-way
	250 mG for double circuit 500 kV Lines- at edge of right-of-way
	150 mG for 230 kV and smaller Lines- at edge of right-of-way

Source: OTA 1989

TABLE 3.10-7: AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS OCCUPATIONAL THRESHOLD LIMIT VALUES FOR 60-HZ EMF

Electric Field	Magnetic Field
Occupational exposures should not exceed :	**Occupational exposures should not exceed :**
25 kV/m (from 0 Hz to 100 Hz)	10 G (10,000 mG)
Prudence dictates the use of protective devices (e.g. suits, gloves, insulation) in fields above 15 kV/m.	
For workers with cardiac pacemakers or similar medical electronic devices, maintain exposure at or below 1 kV/m (1,000 V/m).	*For workers with cardiac pacemakers or similar medical electronic devices, maintain exposure at or below 1 G (1,000 mG).*

Source: ACGIH 1999

TABLE 3.10-8: INTERNATIONAL COMMISSION ON NON-IONIZING RADIATION PROTECTION (ICNIRP)

Exposure (60 Hz)	Electric Field	Magnetic Field
Occupational :		
Reference Levels for Time-Varying Fields	8.333 kV/m (8,333 V/m)	4.167 G (4,167 mG)
Current Density for Head and Body	10 mA/m^2 (25 kV/m)	10 mA/m^2 (5 G)
General Public :		
Reference Levels for Time-Varying Fields	4.167 kV/m (4,167 V/m)	0.833 G (833 mG)
Current Density for Head and Body	2 mA/m^2 (5 kV/m)	2 mA/m^2 (1 G)

Source: ICNIRP 1998

3.10.3 ENVIRONMENTAL CONSEQUENCES

The following sections analyze potential health and safety impacts associated with fire management, hazardous materials, and electric and magnetic fields (EMF).

SIGNIFICANCE CRITERIA

Project construction and operation activities would have a significant impact to public health and safety if they would:

- Create a new fire hazard.
- Involve the use of disposal of hazardous materials that pose a substantial hazard to people or the environment.
- Interfere with adopted emergency response plans or emergency evacuation plans.
- Create a substantial public health hazard.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to All Route Alternatives

The following section identifies potential public health and safety impacts that would be common to all of the route alternatives (i.e., they would occur with any of the route alternatives).

Fire Management

- ***Impact Health and Safety-1: Potential Fire Hazards Related to Construction, Operation and Maintenance***

  Construction, operation, and maintenance of the project could increase the potential for a fire in the project area. Workers smoking, sparks from equipment, or other activities could start a fire. The potential for fire hazards is considered a significant impact that could be mitigated to less-than-significant by implementation of the following mitigation measures.

- ***Mitigation Measure Health and Safety-1***

  In addition to Mitigation Measures Vegetation-1 and -4, Invasive Weeds-1, and actions outlined in the Reclamation Plan in Appendix E, SPPC would implement a Fire Prevention and Suppression Plan during construction, operation, and maintenance of the proposed transmission line. While a detailed plan should be prepared as part of the COM Plan, a preliminary outline of the plan is provided in Appendix F, Preliminary Fire Prevention and Suppression Plan, describing some of the basic practices and techniques that should be used to minimize fire hazards associated with the project.

- ***Impact Public Health and Safety-2: Potential Fire Hazard from Energized Transmission Line***

  When the transmission line is energized, it could potentially cause a fire hazard if a conducting object were to come into proximity to the transmission line, resulting in a flashover to ground, or if an energized phase conductor were to fall to the earth and remain in contact with combustible material long enough to heat this material and cause a fire. The mechanical and structural design, selection of materials, and construction of transmission lines takes into account normal and unusual structural loads, such as ice and wind, which could cause the phase conductors to break. It is theoretically possible that an energized phase conductor could cause a fire if it were to fall to the ground and create an electrical arc that can ignite combustible material; however, this is a very unlikely event. If, for some reason, an energized phase conductor does fall to the ground and create a line-ground fault, high-speed relay equipment is designed to sense that condition and actuate circuit breakers that can de-energize the line in less than about one-tenth of a second. This procedure has proven to be a reliable safety measure and reduces the risk of fire from high voltage transmission lines to a low level.

  Furthermore, SPPC would construct the line to comply with minimum ground clearances set forth in the National Electrical Safety Code and would clear trees and tall objects under the transmission line over the life of the project to provide adequate distance from objects below the line.

  If a vehicle were refueled under a high-voltage transmission line, a possible safety concern could be the potential for accidental fuel ignition. The source of fuel ignition could be a spark discharge into fuel vapors collected in the filling tube near the top of the gas tank. The spark discharge would be due to current induced in a vehicle (insulated from ground) by the electric field of the transmission line and discharged to ground through a metallic refueling container held by a well-grounded person.

Theoretical calculations show that if a number of unlikely conditions exist simultaneously, a spark could release enough energy to ignite gasoline vapors (EPRI 1982: 381). This could not occur if a vehicle were simply driven or parked under a transmission line. Rather, several specific conditions would need to be satisfied: A large gasoline-powered vehicle would have to be parked in an electric field of about 5 kV/m or greater (Deno 1985). A person would have to be refueling the vehicle while standing on damp earth and while the vehicle is on insulating dry asphalt or gravel. The fuel vapors and air would have to mix in an optimum proportion. Finally, the pouring spout must be metallic. The chances of having all the conditions necessary for fuel ignition present at the same time are extremely small. Very large vehicles (necessary to collect larger amounts of electric charge) are often diesel-powered, and diesel fuel is less volatile and more difficult to ignite. The proposed 345 kV transmission line electric field levels are too low (about 1.1-4.5 kV/m on the right-of-way) for the minimum energy necessary for fuel ignition under any practical circumstances.

An additional consideration would be gasoline stations located near the right-of-way edge. The low electric fields of the transmission line would be further reduced to almost zero due to shielding by typical metallic coverings over the refueling area and by the presence of any nearby light poles or trees (Deno 1987). A typical tractor-trailer gasoline truck used to replenish the underground fuel storage tanks is commonly grounded during fuel handling operations, and this is done to eliminate electric discharges. Therefore, fuel ignition does not pose a significant hazard.

SPPC also would outline its standard fire monitoring and emergency response procedures in the COM Plan, including protocols for notifying local fire protection agencies. Thus, fire hazards from the transmission line would be considered adverse but not significant.

❑ ***Impact Health and Safety-3: Potential Fire Hazards Related to Cheatgrass***

The invasion of cheatgrass and consequential increased wildfire frequency is a natural phenomenon that is occurring throughout the Great Basin. However, cheatgrass invasion can be accelerated in areas with ground disturbances, as discussed in Sections 3.4, Vegetation and 3.5, Invasive Nonnative Species. Vegetation disturbance related to project construction has the potential to contribute to increases in cheatgrass cover and extent, which could lead to increased wildfire frequency and fire damage. However, this potentially significant impact would be mitigated to less-than-significant through implementation of Mitigation Measures Vegetation-1 and Invasive Weeds-1 and the Reclamation Plan in Appendix E.

Hazardous Materials

Use of hazardous materials during project construction, operation, and maintenance would pose potential health and safety hazards to construction and maintenance workers and nearby residents. These impacts would be associated with blasting during tower installation, use of hazardous substances during construction and maintenance activities, and the potential for spills. The following list displays hazardous materials that are typically used for SPPC transmission line projects (Aspen 1995).

- 2-cycle oil (contains distillates and hydrotreated heavy paraffinic)
- ABC fire extinguisher
- Acetylene gas
- Air tool oil
- Ammonium hydroxide
- Automatic transmission fluid
- Battery acid (in vehicles and in the meter house of the substations)
- Bee Bop Insect Killer
- Canned spray paint
- Chain lubricant (contains methylene chloride)
- Connector grease (penotox)

- Contact cleaner 2000
- Diesel de-icer
- Diesel fuel additive
- Explosives (detonators, detonator assemblies – non-electric, tubular primers, cap-type primers, ammonium nitrate fertilizers)
- Eye glass cleaner (contains methylene chloride)
- Gasoline
- Gasoline treatment
- Hot Stick Cleaner (cloth treated with polydimethylsiloxane)
- Insulating oil (inhibited, non-PCB)
- Lubricating grease
- Mastic coating
- Methyl alcohol
- North wasp and hornet spray (1,1,1-trichloroethene)
- Oxygen
- Paint thinner
- Petroleum products (gasoline, diesel fuel, jet fuel A, lubricants, brake fluid, hydraulic fluid)
- Prestone 11 Antifreeze
- Propane
- Puncture Seal Tire Inflator
- Safety Fuses
- Starter Fluid
- Sulfur Hexaflouride (within the circuit breakers in the substations)
- Wagner Brake Fluid
- WD-40
- ZEP (safety solvent)
- ZIP (1,1,1-Tricholorethane)

Use, storage, and disposal of hazardous materials are regulated by numerous local, state, and federal laws. Existing laws that SPPC would be required to comply with for the Falcon to Gonder project include, but are not limited to, local emergency planning laws and programs; U.S. Department of Transportation regulations related to the transport of hazardous substances; the Resource Conservation and Recovery Act, Toxic Substances Control Act; Comprehensive Environmental Response; Compensation and Liability Act; Superfund Amendments and Reauthorization Act; Emergency Planning and Community Right-to-Know Act; Clean Water Act; Clear Air Act; BLM W.O. IM-93-344; and 40 CFR 260-302.

Detailed information about the use, storage and disposal of hazardous materials will be provided in the Construction, Operation and Maintenance (COM) Plan that would be submitted to BLM. This Plan will define specific procedures for vehicle refueling and servicing, transportation and storage of hazardous materials, and disposal of hazardous wastes. For example, construction vehicles and equipment would be required to be serviced and fueled at least 100 feet from wetlands and streams. Refueling locations should be generally flat to decrease the chance of a spilled substance reaching a stream or wetland.

Procedures would be outlined to minimize the chance of a fuel spill during servicing and refueling. Vehicles would be required to carry absorbent material to handle potential spills, would be inspected for fuel leaks regularly, and would be equipped with fire fighting equipment. Hazardous materials would be transported in Department of Transportation (DOT) approved containers and allowed only on approved access roads. Vehicles carrying hazardous materials would be equipped with appropriate materials to contain a small spill should one occur during transport. Vehicles and storage containers would be properly signed/marked and inspected for leakage and other potential safety problems prior to transportation.

Hazardous materials would be stored in proper containers in material yards and designated construction areas. Cleanup materials will be stored in these areas. Hazardous wastes, including used oil, used oil filters, used gasoline containers, spent batteries, and other items, would be collected regularly and disposed of in accordance with all applicable laws. Every effort should be made to minimize the

production of hazardous waste during the project, such as using non-hazardous substances when available, minimizing the amount of hazardous materials used for the project, and recycling and filtering hazardous materials.

Under existing law, SPPC would be required to maintain Material Safety Data Sheets and a Department of Transportation (DOT) Emergency Response Guidebook at material yards, construction sites, substations, and in construction and maintenance crew vehicles. SPPC also would be required to complete an SF 299 Section 19 Hazardous Materials List and prepare and submit for approval a Blasting Plan and a Spill Prevention and Control Plan (in addition to the Fire Prevention and Suppression Plan noted above). These plans, along with the DOT Emergency Response Guidebook, would adequately control the use, production, transportation, and storage of hazardous materials along the transmission line corridor, access roads, material yards, and substations. In addition, SPPC is prohibited by law from treating or disposing of any hazardous materials outside of an approved treatment or disposal site. Proper implementation of the COM Plan would be expected to result in less-than-significant impacts from hazardous materials.

The Fire Prevention and Suppression Plan, Spill Prevention and Control Plan, and Blasting Plan would be included in the COM Plan, as well. Also, as part of its standard operating procedures, SPPC would develop a health and safety plan with procedures for emergencies and coordination with local hospitals and public safety officials. The transmission line would not block use of paved roadways, and thus, is not expected to interfere with adopted emergency response plans or emergency evacuation plans.

❑ ***Impact Health and Safety-4: Potential Health and Safety Impacts from Hazardous Materials***

Use of hazardous materials during project construction, operation, and maintenance would pose potential health and safety hazards to construction and maintenance workers and nearby residents. These impacts would be associated with blasting during tower installation, use of hazardous substances during construction and maintenance activities, and the potential for spills. However, compliance with existing laws regulating the use, storage, transportation and disposal of hazardous materials, and the preparation and implementation of the Fire Prevention and Suppression, Spill Prevention and Control, and Blasting Plans in the COM Plan, would minimize these public health and safety hazards. Therefore, potential health and safety impacts from use, storage, and disposal of hazardous materials would be less-than-significant.

Electric and Magnetic Fields

This following section evaluates electrical effects associated with operation of the high-voltage electric power facilities proposed for the Falcon to Gonder project. These electrical effects include corona and field effects. EMF is generally described and project levels are calculated. Power frequency EMF is a natural consequence of electrical circuits and can be either directly measured with proper instruments, or calculated using appropriate information. The potential effects of EMF are discussed along with other considerations, such as induced currents, fires, and computer interference.

Facility Description

The Falcon to Gonder transmission line is proposed to be built as a single circuit 345,000-volt (345 kV) AC line with twin 954 kcm ACSR conductors per phase and two 3/8 inch EHS steel overhead shieldwires. The transmission line would be supported by approximately 725 to 820 tubular steel H-frame structures that would vary in height from 75 to 130 feet above ground level, depending on terrain. The 345 kV transmission line right-of-way width would be 160 feet. The H-frame tower structure helps discourage attempts by unauthorized people to climb the towers. At some locations, the 345 kV line may parallel existing rights-of-way for lower voltage transmission lines (25 kV, 66 kV, 120 kV, and 230 kV).

The transmission line would be parallel to existing transmission lines in some locations (e.g., Segments A, B, E, I, and J), and stand alone in other locations. To analyze EMFs that would be generated by the project, three different transmission line configurations were selected as representative examples:

1. The proposed 345 kV line alone.
2. The proposed 345 kV line paralleling existing 66/25 kV and 120 kV transmission lines.
3. The proposed 345 kV line paralleling an existing 230 kV transmission line.

Figures 3.10-1 through 3.10-3 present diagrams of each respective transmission line configuration.

The project also includes the installation of additional facilities at the existing Falcon and Gonder substations. The Falcon 345/120 kV substation would have new switching equipment installed, including a terminal bay, buswork, and three 345 kV power circuit breakers and two 345 kV reactors to control voltage. One reactor would be a fixed reactor continuously connected to the line. The second reactor would be a switched reactor utilized during light loading conditions or during line switching. The existing Falcon substation pad and fenced area would be expanded approximately 3 acres to the south and east. The Gonder 230/69 kV substation (owned and operated by Mt. Wheeler Power) would be upgraded to 345 kV. New 230 kV buswork would be required to connect to the existing 230 kV ring bus. New equipment includes two 230 kV power circuit breakers, two 345/230 kV- 300 MVA transformers, two 345 kV power circuit breakers, and two 345 kV reactors to control voltage. The substation pad and fenced area would require an approximate 6.2-acre expansion to the north.

Electric Fields

Methodology

In cases where a transmission line is proposed to be constructed, electric field values can be calculated using computer modeling software. These programs allow the transmission line configuration information and other parameters to be entered into the program to create a model of the proposed line. The software then calculates the power frequency electric field at locations of interest. Results obtained with computer models have been compared with measurement data for operating transmission lines and calculation accuracy has been evaluated. Typically, the computer model would calculate electric field values to within +/- 5% of actual field measurements.

A computer program originally developed by the Bonneville Power Administration was used to perform the field calculations (BPA 1977). Ground clearances and span lengths can vary throughout the length of each of the transmission line segments due to the irregular terrain. Since these elevation variations are present in the project area, the minimum conductor ground clearance was assumed for each transmission line modeled.

Angle structures were not specifically modeled in the calculations for the following reasons: electric fields values in most cases would not be significantly greater than the values calculated for other structures modeled (this is because the strongest fields usually occur away from the angle structure near the mid-span of the transmission line), and angle structures make up a small percentage of the line. Therefore, only straight segments of the transmission line were modeled.

Certain assumptions were made to generate a reasonable worst-case scenario for electric field calculation purposes. These assumptions included: a 5% over-voltage condition; all minimum ground clearances occur simultaneously for each configuration; and currents were balanced and had a phasing of A = 0 degrees, B = 240 degrees, and C = 120 degrees. It is important in these calculations to properly and consistently designate the phase relationship of the conductors. In modern electrical systems, power is generated by three-phase generators. Each phase is connected to one conductor of the transmission line and called Phase A, Phase B, or Phase C. This designation is followed through the entire system from generator to substation. Because the system operates with all generators in synchronism, currents in Phase A are displaced in time from currents in Phases B and C. By convention, SPPC has designated Phase A equal to 0 degrees, Phase B equal to 240 degrees, and Phase C equal to 120 degrees. These values are essential to the calculations and are part of the assumptions made here.

FIGURE 3.10-1: CONFIGURATION #1: PROPOSED 345 KV TRANSMISSION LINE ALONE

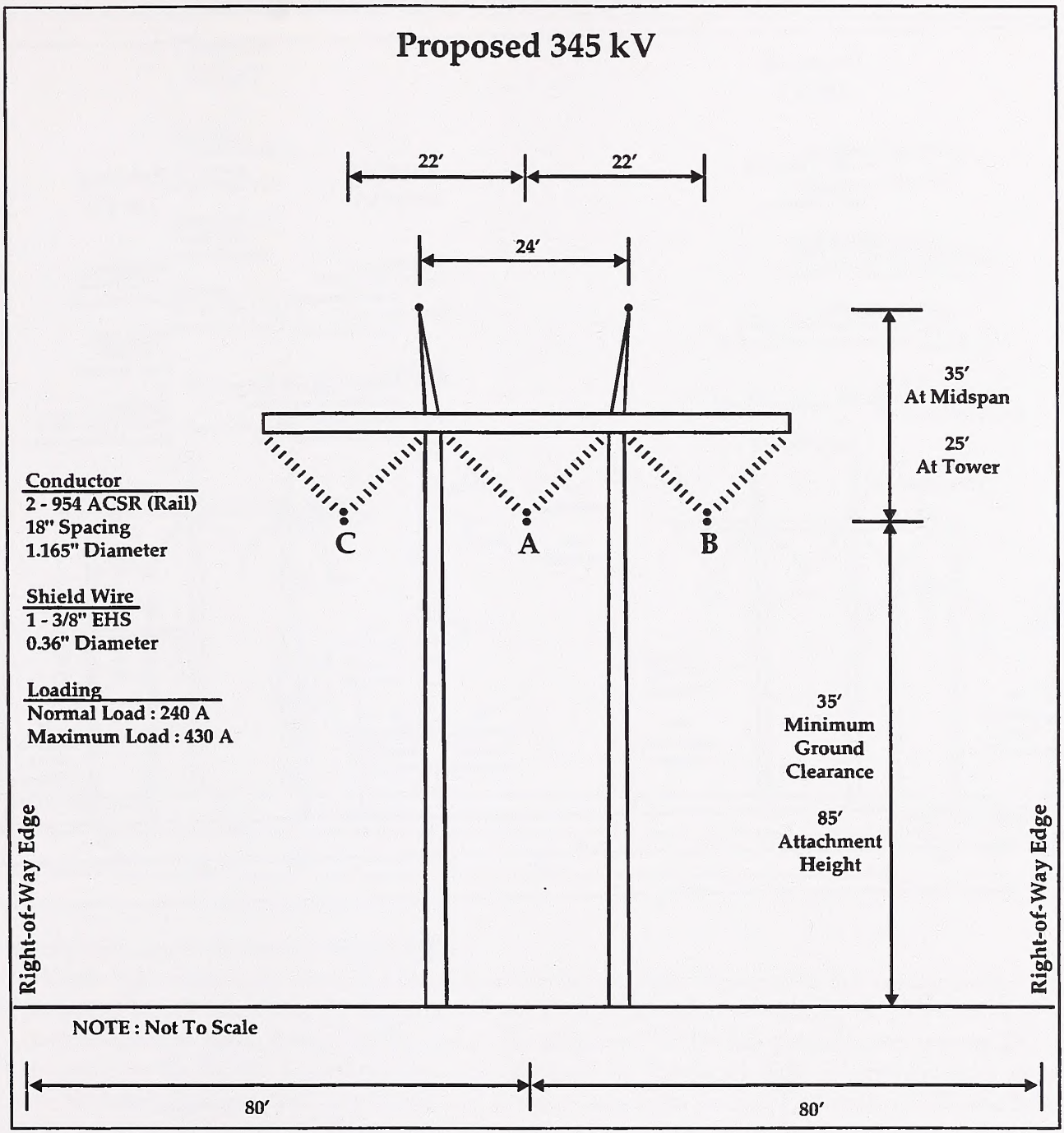


FIGURE 3.10-2: CONFIGURATION #2: PROPOSED 345 KV TRANSMISSION LINE PARALLELING EXISTING 66/25 KV AND 120 KV TRANSMISSION LINES

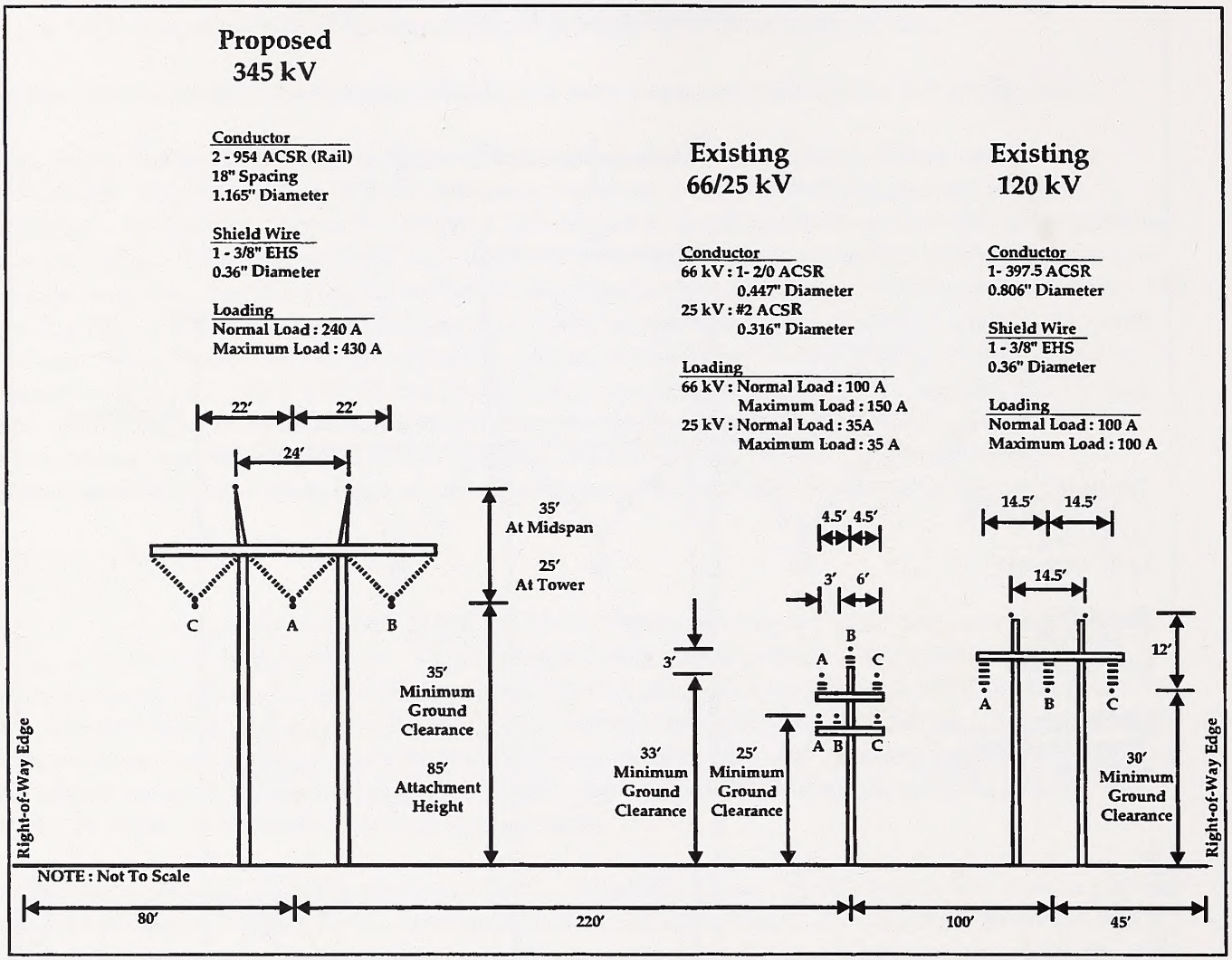
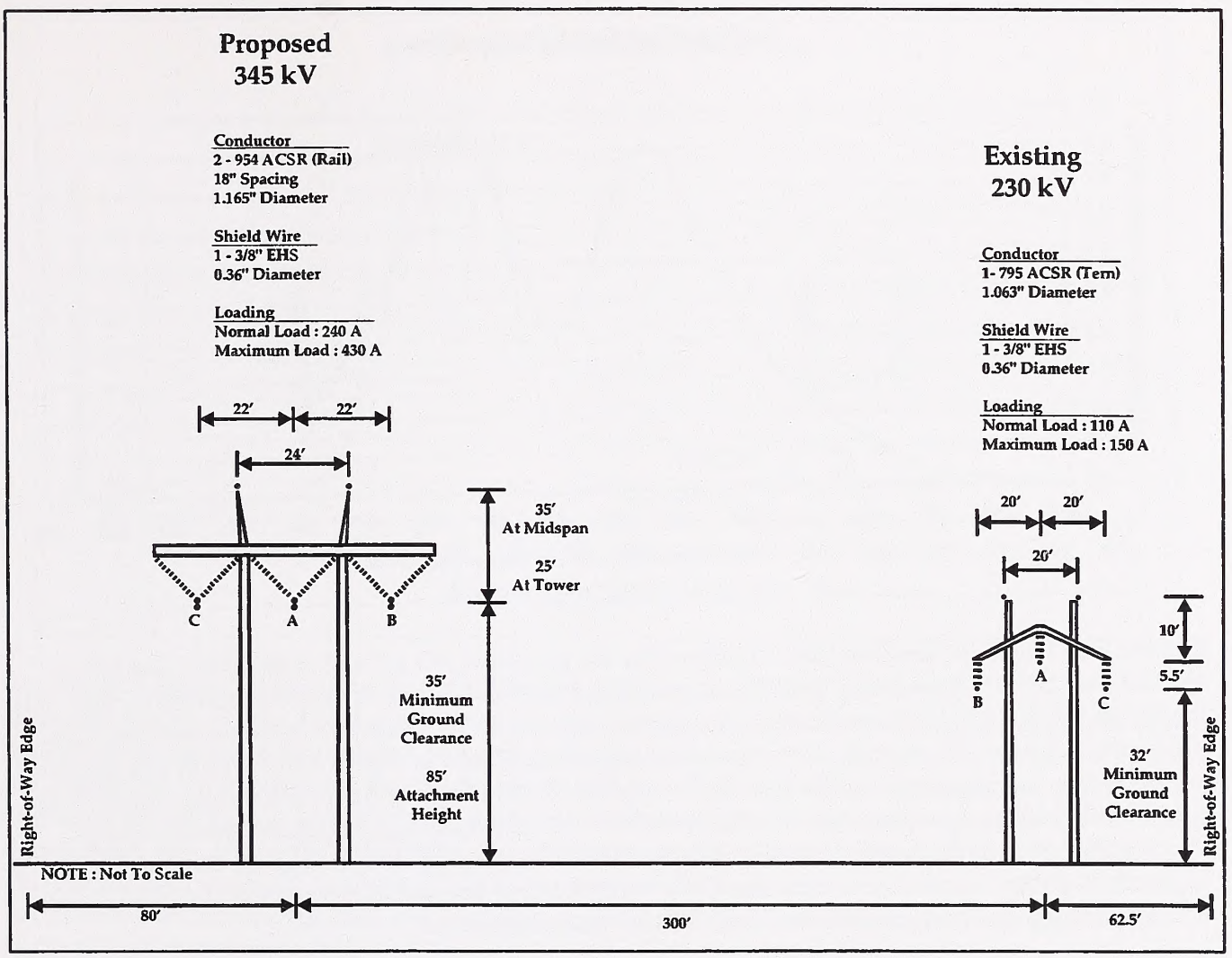


FIGURE 3.10-3: CONFIGURATION #3: THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING EXISTING 230 KV TRANSMISSION LINE

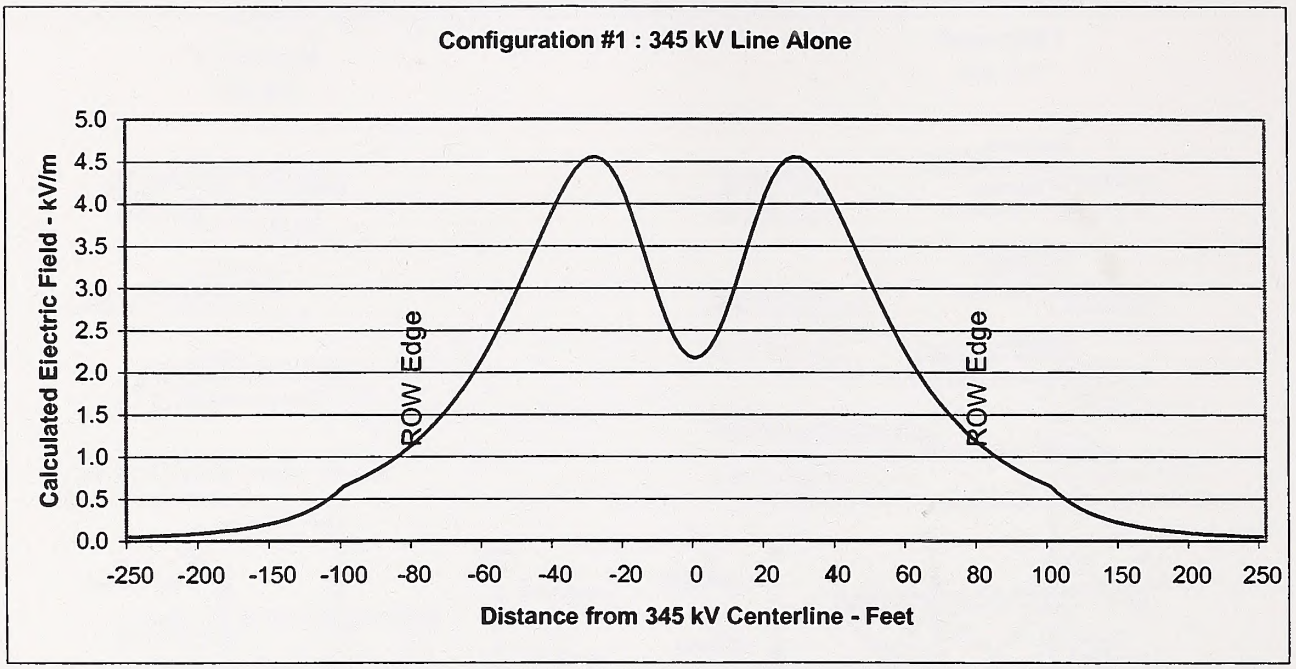


Transmission Line – Estimated Project Effects

The electric field values were calculated for each of the three sample transmission line configurations: (1) the proposed 345 kV line alone, (2) the proposed 345 kV line paralleling an existing 66/25 kV and 120 kV transmission line right-of-way (ROW), and (3) the proposed 345 kV line paralleling an existing 230 kV transmission line ROW. Lateral profiles were calculated for the electric field (a lateral profile is a plot of the calculated maximum field as a function of distance away from the ROW center). All electric field calculations were made at the IEEE standard of 1 meter above ground level and at transmission line midspan.

An electric field graph showing the lateral profile of the calculated field extending away from the proposed 345 kV H-frame configuration is shown in Figure 3.10-4. The calculated electric field is about 1.159 kV/m along each side of the right-of-way edge, with a maximum field of about 4.559 kV/m on the right-of-way. These calculated electric field levels would be an increase over an ambient condition of 0.0 kV/m for those locations where no other existing electrical facilities are present.

FIGURE 3.10-4: CALCULATED ELECTRIC FIELD PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE ALONE



Electric field lateral profiles were also calculated for the proposed 345 kV with a 66/25 kV and 120 kV transmission lines. Figure 3.10-5 presents the calculated electric field for the existing condition, with only the 66/25 kV and 120 kV transmission lines present. Electric field calculations with the addition of the proposed Falcon to Gonder 345 kV transmission line are presented in Figure 3.10-6. With this proposed configuration, the calculated electric field is about 1.158 kV/m along the right-of-way edge closest to the proposed 345 kV transmission line. Under the 345 kV line, the maximum calculated electric field is about 4.547 kV/m. The electric field decreases to about 0.200 to 0.300 kV/m near the 66/25 kV line, increases to about 1.138 kV/m under the 120 kV transmission line, and then decreases to about 0.614 kV/m at the right-of-way edge closest to the 120 kV transmission line.

FIGURE 3.10-5: CALCULATED ELECTRIC FIELD PROFILE FOR THE EXISTING 66/25 KV AND 120 KV TRANSMISSION LINES

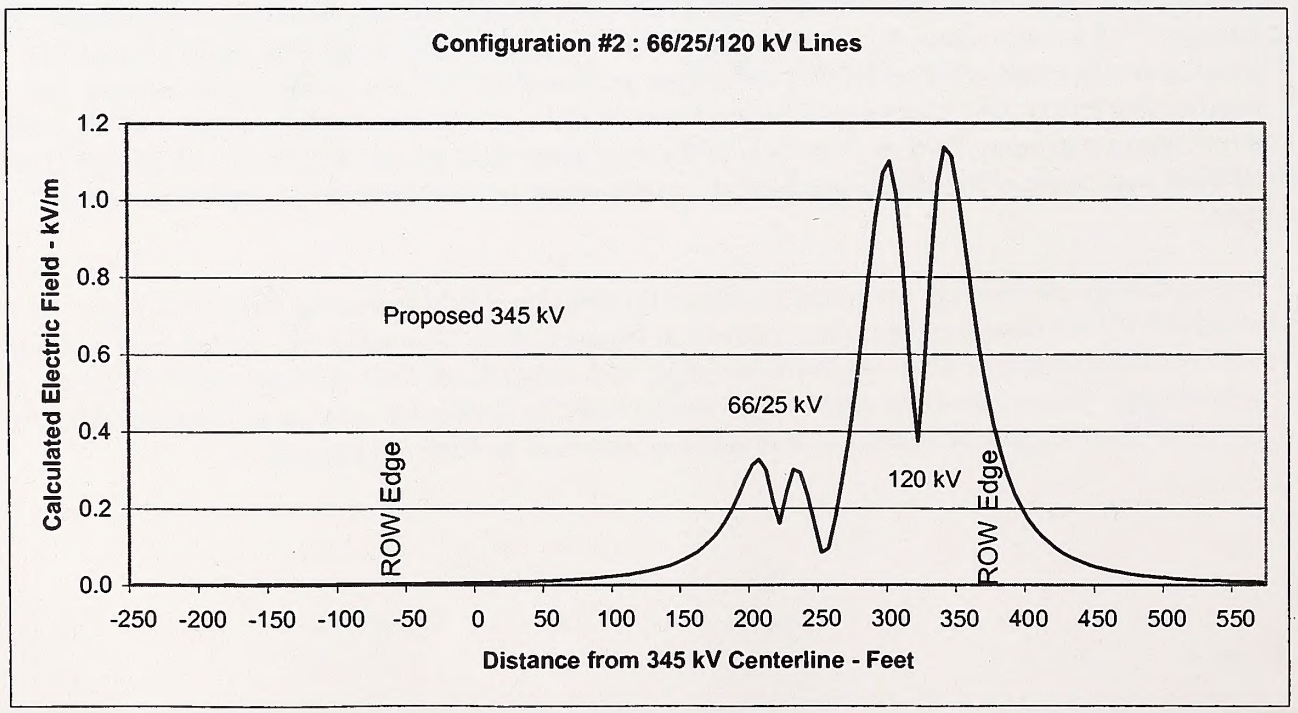
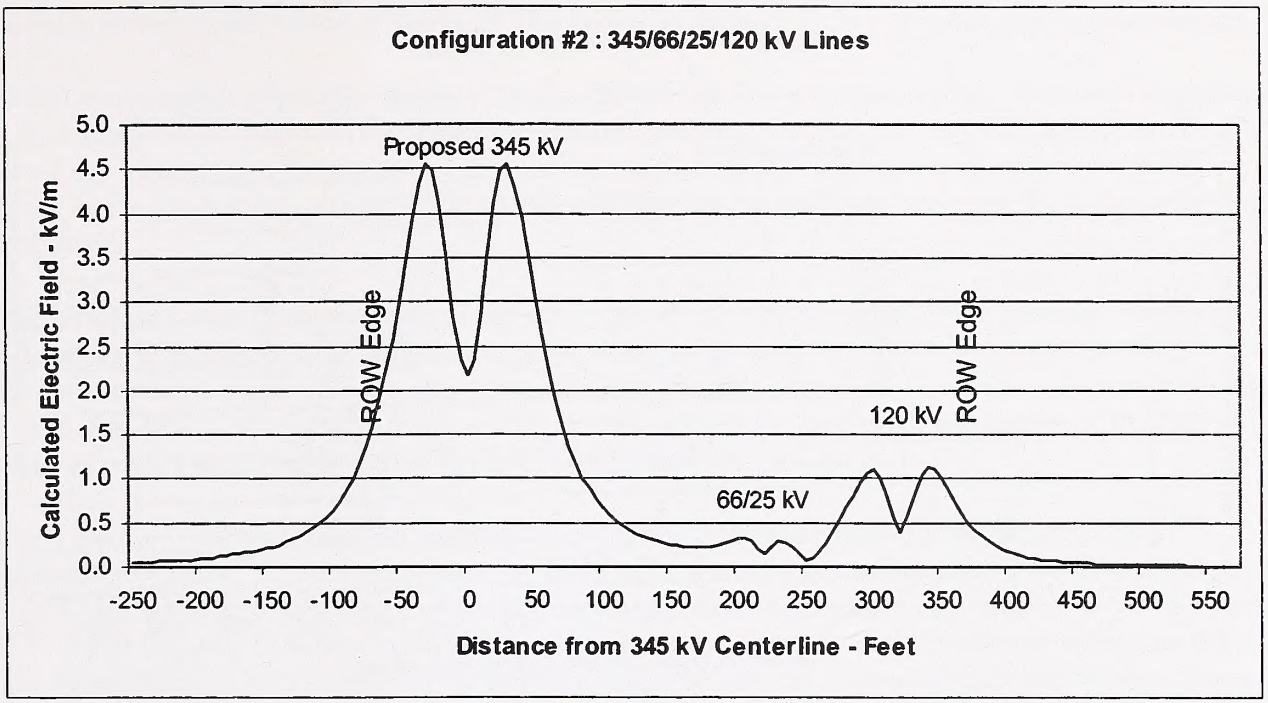


FIGURE 3.10-6: CALCULATED ELECTRIC FIELD PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING THE EXISTING 66/25 KV AND 120 KV TRANSMISSION LINES



Electric field lateral profiles were also calculated for the proposed 345 kV parallel to a 230 kV transmission line. Figure 3.10-7 presents the calculated electric field for the existing condition, with only the 230 kV transmission line present. Electric field calculations with the addition of the proposed Falcon to Gonder 345 kV transmission line are presented in Figure 3.10-8. With this configuration, the calculated electric field is 1.157 kV/m along the right-of-way edge closest to the proposed 345 kV transmission line. Under the 345 kV line, the maximum calculated electric field is about 4.555 kV/m. The electric field decreases to about 0.270 kV/m between the lines, increases to about 2.524 kV/m near the 230 kV transmission line, and then decreases to about 0.879 kV/m at the right-of-way edge closest to the 230 kV transmission line.

FIGURE 3.10-7: CALCULATED ELECTRIC FIELD PROFILE FOR THE EXISTING 230 KV TRANSMISSION LINE

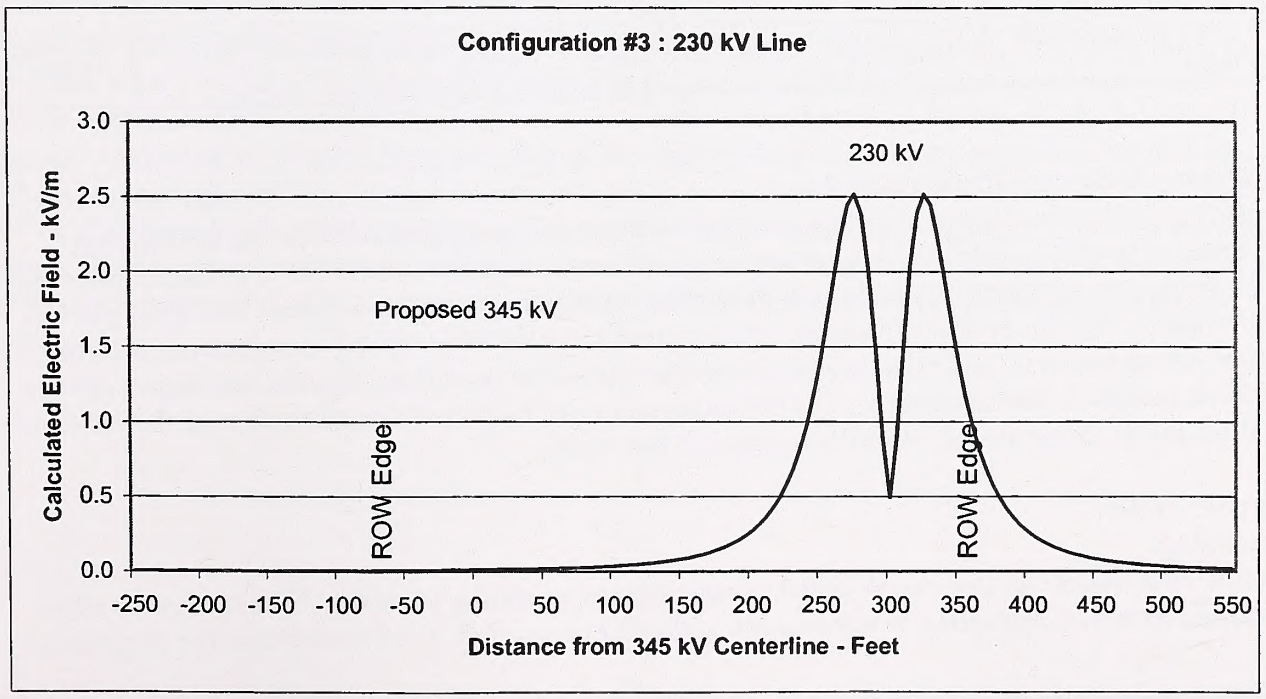


FIGURE 3.10-8: CALCULATED ELECTRIC FIELD PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING EXISTING 230 KV TRANSMISSION LINE

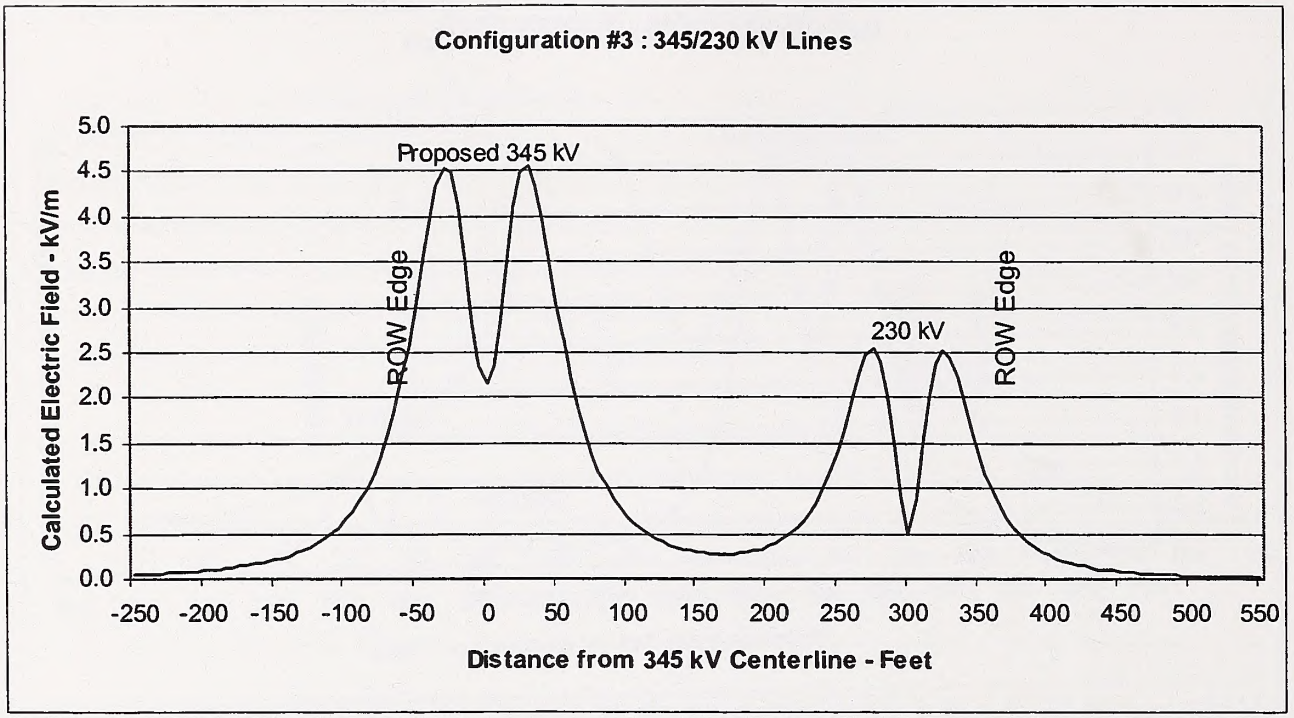


Table 3.10-9 summarizes the electric field calculations for the three transmission line configurations.

TABLE 3.10-9: SUMMARY OF ELECTRIC FIELD CALCULATIONS FOR THE THREE TRANSMISSION LINE CONFIGURATIONS

CALCULATED ELECTRIC FIELD – KV/M							
Configuration Type	ROW Edge	Maximum on ROW	ROW Edge	Max Near 345 kV	Max Near 66/25 kV	Max Near 120 kV	Max Near 230 kV
#1 : 345 kV Alone	1.159	4.559	1.159	4.559			
#2 : 345 kV with 66/25/120 kV Lines	1.159	4.547	0.614	4.547	0.300	1.138	
#3 : 345 kV with 230 kV Line	1.157	4.555	0.879	4.555			2.524

Substation – Estimated Project Effects

The electric field from substation equipment and buswork are typically shielded by the surrounding equipment, supporting structures, substation fence, and other nearby objects. The dominant sources of electric fields near a substation are typically the overhead electrical transmission lines that enter and exit the substation. For the Falcon to Gonder 345 kV project, the addition of new transformers, buswork, reactors, circuit breakers, and other internal electrical equipment should not significantly impact electric field levels outside of the substation. The dominant source of increased electric fields near the substation would be due to the proposed 345 kV transmission line itself.

Magnetic Fields

Methodology

Magnetic field values can also be calculated using computer modeling software. These programs allow the transmission line configuration information and other parameters to be entered into the program to

create a model of the proposed line. The software then calculates the power frequency magnetic field at locations of interest. Results obtained with computer models have been compared with measurement data for operating transmission lines, and calculation accuracy has been evaluated. Typically, the computer model would calculate magnetic field values to within +/- 5% of actual field measurements.

A computer program originally developed by the Bonneville Power Administration was used to perform the field calculations (BPA 1977). Ground clearances and span lengths can vary throughout the length of each of the transmission line segments due to the irregular terrain. Since these elevation variations are present in the project area, the minimum conductor ground clearance was assumed for each transmission line modeled.

Angle structures were not specifically modeled in the calculations for the following reasons: magnetic fields values, in most cases, would not be significantly greater than the values calculated for other structures modeled (this is because the strongest fields usually occur away from the angle structure near the mid span of the transmission line), and angle structures make up a small percentage of the line. Therefore, only straight segments of the transmission line were modeled.

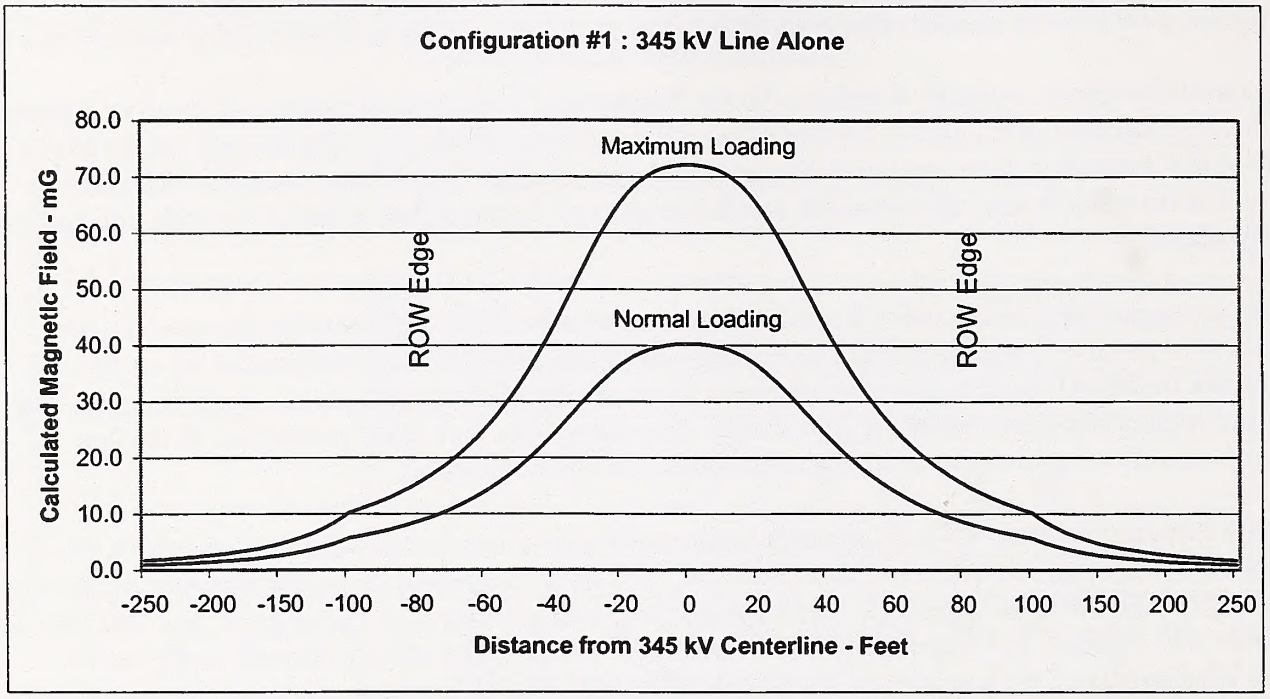
Certain assumptions were made to generate a reasonable worst case scenario for magnetic field calculation purposes. These assumptions included: all minimum ground clearances occur simultaneously for each configuration; and currents were balanced and had a phasing of A = 0 degrees, B = 240 degrees, and C = 120 degrees. It is important in these calculations to properly and consistently designate the phase relationship of the conductors. In modern electrical systems, power is generated by three-phase generators. Each phase is connected to one conductor of the transmission line and called Phase A, Phase B, or Phase C. This designation is followed through the entire system from generator to substation. Because the system operates with all generators in synchronism, currents in Phase A are displaced in time from currents in Phases B and C. By convention, SPPC has designated Phase A equal to 0 degrees, Phase B equal to 240 degrees, and Phase C equal to 120 degrees. These values are essential to the calculations and are part of the assumptions made here. The direction of current flow for all of the transmission lines was assumed to be in the same direction.

Transmission Line – Estimated Project Effects

The magnetic field values were calculated for each of the three sample transmission line configurations. Lateral profiles were calculated for the magnetic field (a lateral profile is a plot of the calculated maximum field as a function of distance away from the ROW center). All magnetic field calculations were made at the IEEE standard of 1 meter above ground level and at transmission line mid-span.

A magnetic field graph showing the lateral profile of the calculated field extending away from the proposed 345 kV H-frame configuration is shown in Figure 3.10-9 for both normal and maximum loading conditions (240 A and 430 A, respectively). Under normal loading conditions, the calculated magnetic field is about 8.6 mG along each side of the right-of-way edge, with a maximum field of about 40.3 mG on the right-of-way. Under maximum loading conditions, the calculated magnetic field is about 15.4 mG along each side of the right-of-way edge, with a maximum field of about 72.1 mG on the right-of-way. These calculated magnetic field levels would be an increase over an ambient condition of 0.0 mG for those locations where no other existing electrical facilities or other sources of electric current are present.

FIGURE 3.10-9: CALCULATED MAGNETIC FIELD PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE ALONE



Magnetic field lateral profiles were also calculated for the proposed 345 kV parallel to a 66/25 kV and 120 kV transmission lines. Figure 3.10-10 presents the calculated magnetic field for the existing condition, with only the 66/25 kV and 120 kV transmission lines present. Magnetic field calculations with the addition of the proposed Falcon to Gonder 345 kV transmission line are presented in Figure 3.10-11.

FIGURE 3.10-10: CALCULATED MAGNETIC FIELD PROFILE FOR THE EXISTING 66/25 KV AND 120 KV TRANSMISSION LINES

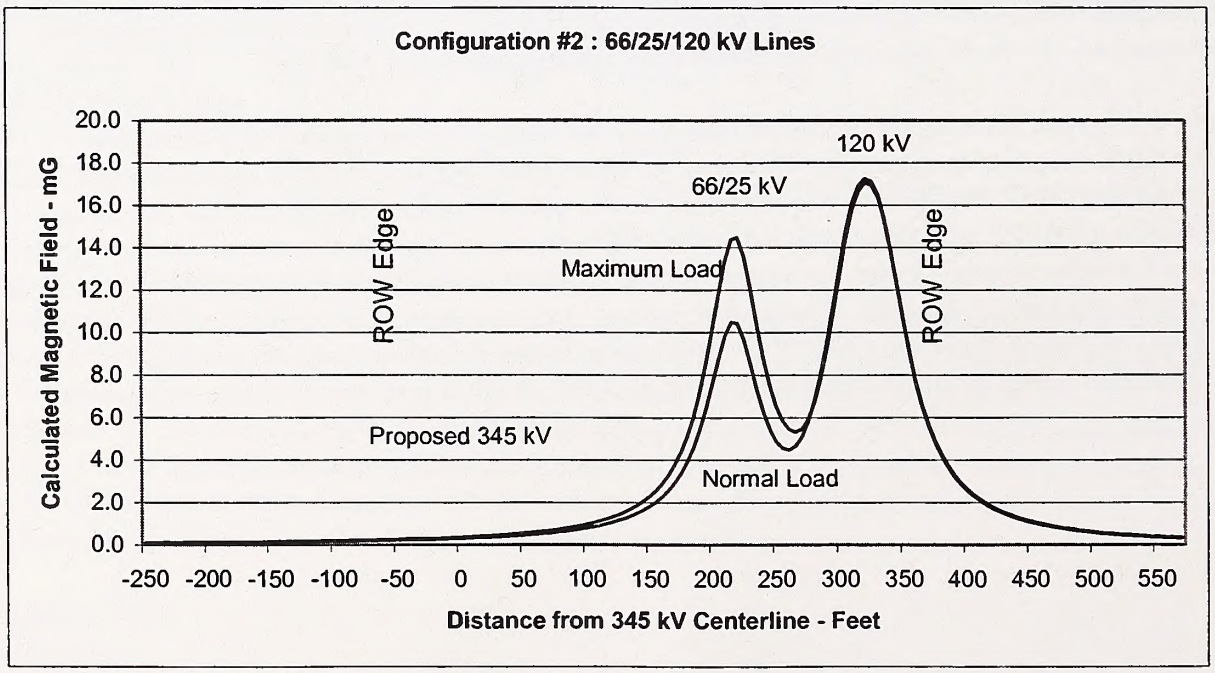
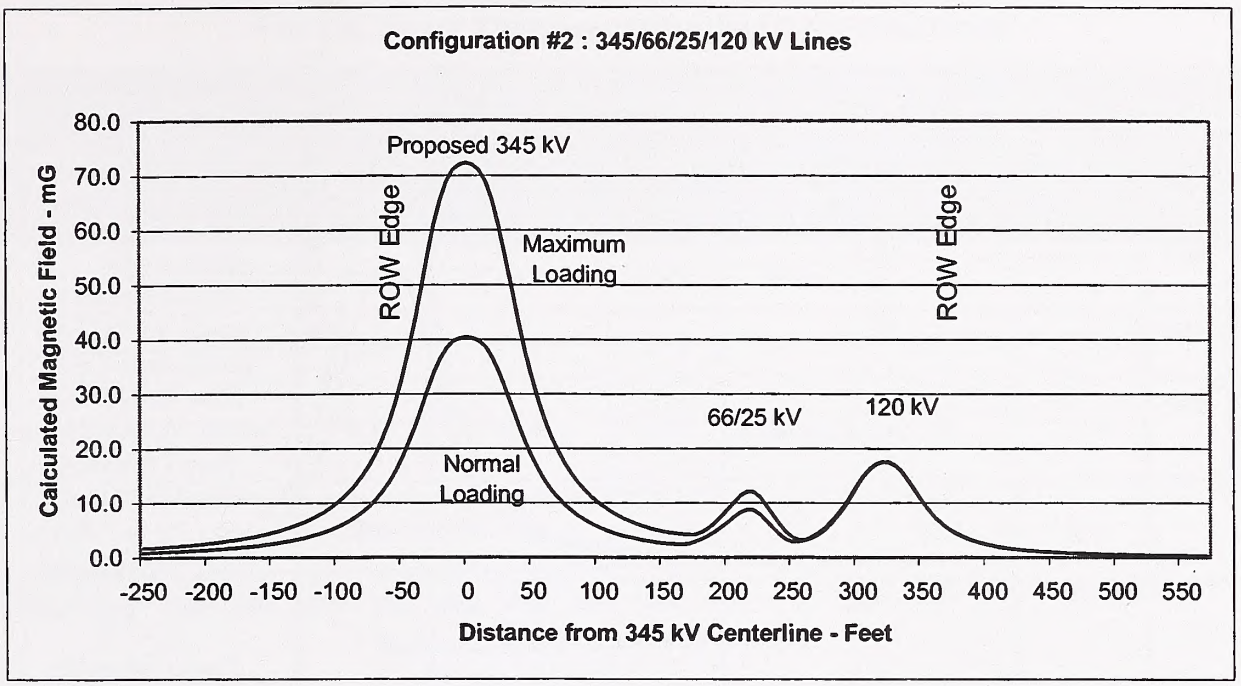


FIGURE 3.10-11: CALCULATED MAGNETIC FIELD PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING EXISTING 66/25 KV AND 120 KV TRANSMISSION LINES



With this configuration under normal loading conditions, the calculated magnetic field is about 8.5 mG along the right-of-way edge closest to the proposed 345 kV transmission line. Under the 345 kV line, the maximum calculated magnetic field is about 40.4 mG. The magnetic field decreases to about 8.8 mG near the 66/25 kV line, increases to about 17.6 mG under the 120 kV transmission line, and then decreases to about 6.9 mG at the right-of-way edge closest to the 120 kV transmission line. For maximum loading conditions, the calculated magnetic field is about 15.2 mG at the right-of-way edge, 72.3 mG under the 345 kV line, 12.1 mG under the 66/25 kV line, 17.6 mG under the 120 kV line, and 6.9 mG at the right-of-way edge.

Magnetic field lateral profiles were also calculated for the proposed 345 kV transmission line parallel to a 230 kV line. Figure 3.10-12 presents the calculated magnetic field for the existing condition, with only the 230 kV transmission line present. Magnetic field calculations with the addition of the proposed Falcon to Gonder 345 kV transmission line are presented in Figure 3.10-13. With this configuration under normal loading conditions, the calculated magnetic field is again 8.4 mG along the right-of-way edge closest to the proposed 345 kV transmission line. Under the 345 kV line, the maximum calculated magnetic field is about 40.5 mG. The magnetic field decreases to about 1.4 mG between the lines, increases to about 21.1 mG near the 230 kV transmission line, and then decreases to about 5.3 mG at the right-of-way edge closest to the 230 kV transmission line. Under maximum loading conditions, the calculated magnetic field is about 15.2 mG at the right-of-way edge, 72.5 mG under the 345 kV line, 29.0 mG under the 230 kV line, and 7.2 mG at the right-of-way edge.

FIGURE 3.10-12: CALCULATED MAGNETIC FIELD PROFILE FOR THE EXISTING 230 KV TRANSMISSION LINE

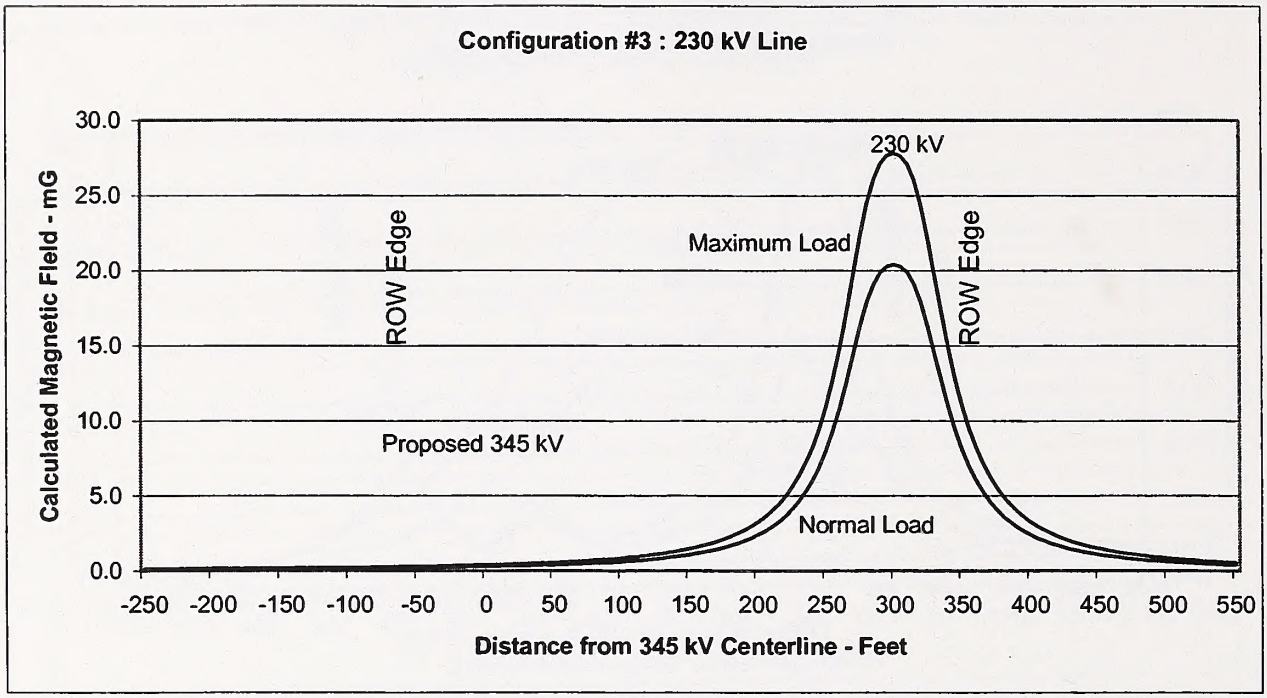


FIGURE 3.10-13: CALCULATED MAGNETIC FIELD PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING EXISTING 230 KV TRANSMISSION LINE

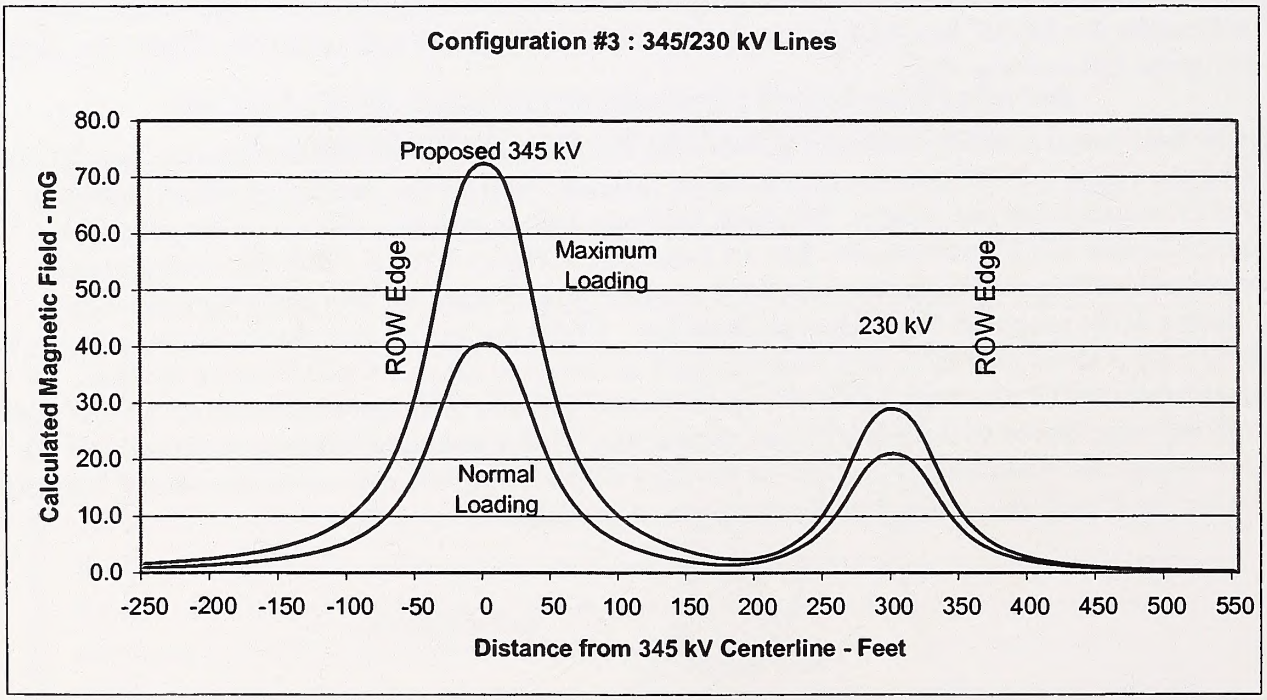


Table 3.10-10 summarizes the magnetic field calculations for the three transmission line configurations.

TABLE 3.10-10: SUMMARY OF MAGNETIC FIELD CALCULATIONS FOR THE THREE TRANSMISSION LINE CONFIGURATIONS

	CALCULATED MAGNETIC FIELD – MG						
Configuration Type and Loading Condition	ROW Edge	Maximum on ROW	ROW Edge	Max Near 345 kV	Max Near 66/25 kV	Max Near 120 kV	Max Near 230 kV
# 1: 345kV Alone (Normal Load)	8.6	40.3	8.6	40.3			
#1: 345 kV Alone (Maximum Load)	15.4	72.1	15.4	72.1			
#2: 345 kV with 66/25/120 kV Lines (Normal Load)	8.5	40.4	6.9	40.4	8.8	17.6	
#2: 345 kV with 66/25/120 kV Lines (Maximum Load)	15.2	72.3	6.9	72.3	12.1	17.6	
#3: 345 kV with 230 kV Line (Normal Load)	8.4	40.5	5.3	40.5			21.1
#3: 345 kV with 230 kV Line (Maximum Load)	15.2	72.5	7.2	72.5			29.0

Substation – Estimated Project Effects

The magnetic field from substation equipment and buswork is typically low at locations beyond the substation property due to the placement of the equipment centrally within the station. Fields from substation equipment act as point sources and attenuate quickly with distance from the equipment. The dominant sources of magnetic fields near a substation are typically the overhead electrical transmission lines that enter and exit the substation. For the Falcon to Gonder 345 kV project, the addition of new transformers, buswork, reactors, circuit breakers, and other internal electrical equipment should not significantly impact magnetic field levels at locations outside of the substation. The dominant source of increased magnetic fields near the substation would be due to the proposed 345 kV transmission line itself.

Induced Currents

The proposed 345 kV transmission line would have the highest electric field within the right-of-way of approximately 4.5 kV/m in the area under the conductors at the lowest point of sag. Other locations on the right-of-way would be less. The electric field would be approximately 1.1 kV/m at the right-of-way edge. These fields are similar to many other 345 kV transmission lines currently in operation (and are generally less than the fields of operational 500 kV lines). Induced currents can be calculated for common objects for a set of theoretical (worst-case) assumptions: the object is perfectly insulated from ground, located in the highest field, and touched by a perfectly grounded person.

Calculations can be made using experimentally determined induction coefficients and the calculated electric field (EPRI 1982:356). Table 3.10-11 summarizes calculated induced current for common objects placed on the right-of-way for the theoretical conditions previously stated.

TABLE 3.10-11: CALCULATED INDUCED CURRENT FOR OBJECTS NEAR 345 KV LINE FOR THEORETICAL CONDITIONS

Object	Length	Induced Current	Induced Current	
		Coefficient- mA/ kV/m	Near Midspan	Right-of-way edge
Pickup Truck	17 ft	0.10	0.45 mA	0.11 mA
Farm Tractor & /Wagon	31 ft	0.30	1.35 mA	0.33 mA
Combine	30 ft	0.38	1.71 mA	0.42 mA
School Bus	34 ft	0.39	1.76 mA	0.43 mA
Tractor-trailer	52 ft	0.64	2.88 mA	0.70 mA

The maximum electric field only occurs on a small portion of the right-of-way, and perfect insulation and grounding states are not common, but for these assumptions the calculated induced current values for the pickup truck, farm tractor pulling crop wagon, school bus, and tractor-trailer are below hazardous levels where a person could not let go of an object (9 mA for men and 6 mA for women). Therefore, this transmission line would comply with the National Electrical Safety Code (NESC) requirements limiting induced currents on objects to 5 mA or less. At the right-of-way edge, the induced current values are near or below the threshold of perception. However, under the 345 kV line near midspan, the calculated induced currents on some of these objects are above the threshold of perception and for certain conditions may be perceived. The Falcon-Gonder transmission line would be designed to comply with the NESC.

Agricultural operations can occur on or near a transmission line right-of-way. Long fences parallel to a transmission line can present an induced current situation, especially if the fence posts are non-metallic and insulate wires from ground. This problem is solved by frequently grounding the fence with a ground rod connected to the fencing wire (usually done during transmission line construction). During project construction, SPPC would properly ground all metallic fences that parallel the transmission line for more than 500 feet and are located within 150 feet of the centerline. Grounding would also include large metal buildings and other metallic objects (personal communication with John Berdrow, SPPC, August 16, 2000).

Irrigation systems often incorporate long runs of metallic pipes that can be subject to field induction when located parallel and close to transmission lines. Because the irrigation pipes contact moist soil, electric field induction is generally negligible, but annoying currents could still be experienced from electric field coupling to the pipe. Pipe runs laid at right angles to the transmission line would minimize induced currents, although such a layout may not always be feasible. If there are induction problems, they can be mitigated by grounding and/or insulating the pipe runs. Operation of irrigation systems beneath transmission lines presents another safety concern. If the system uses a high-pressure nozzle to project a stream of water, the water may make contact with the energized transmission line conductor. Generally, the water stream consists of solid and broken portions. If the solid stream contacts an energized conductor, an electric current could flow down the water stream to someone contacting the high-pressure nozzle. Transmission line contact by the broken-up part of the water stream is unlikely to present any hazard. Guidance on safe operation of irrigation systems near transmission lines can be provided by electric utility engineers.

Lightning

Lightning has a tendency to strike tall objects. Any tall conducting object like a tree or a transmission line structure would have an increased probability of sustaining a lightning strike (Uman 1971). Concern is sometimes expressed that transmission lines are unsafe in electrical storms or somehow attract lightning. However, transmission lines do not "attract" lightning. Atmospheric electricity strikes the earth at locations where localized charge in a cloud and surface conditions cause a lightning stroke to occur. A lightning stroke usually hits the tallest object within the immediate area. A transmission line passing

above the earth can be said to cast an "electrical shadow" on the land beneath it (EPRI 1982:547-548). Lightning strokes that would generally terminate on the land inside the shadow would strike the transmission line instead and strokes outside this shadow would miss the line entirely. If the transmission line were not present, some other object within the immediate area would still be struck by lightning.

Therefore, a transmission line actually protects the land near it from lightning, much as a lightning rod on top of a school protects the building beneath it. In the unlikely scenario where someone is outdoors during a lightning storm and simultaneously touching a transmission line structure, that person could receive a hazardous shock if the line were struck by lightning at that exact moment.

For objects less than 600 feet tall the strike probability is directly related to height (i.e., an object twice as tall as another object would generally have twice as many strikes), although object shape can be a factor too. For objects over about 600 feet tall, the likelihood of lightning strikes increases exponentially (Veimeister 1972:192-193). On a transmission line, the energized phase conductors are protected from lightning strikes by a shield wire(s) installed above the phase conductors. The shield wires of the Falcon to Gonder 345 kV transmission line are designed to intercept and safely conduct lightning to ground. The shield wires work similar to a lightning rod; when lightning strikes the shield wire, the electricity is conducted to earth through the structure which is grounded.

Pacemakers

One area of concern related to the electric and magnetic fields of transmission lines has been the possibility of interference with cardiac pacemakers. Typically, electric and magnetic field levels at a transmission line right-of-way edge are usually below interference levels, but within the right-of-way the electric field threshold for interference may be exceeded. Interference can cause some pacemakers to switch from a normal full function pacing mode to an "asynchronous" fixed pace mode. Some new pacemaker models can be more sensitive to external interference, while other models appear unaffected.

There are two general types of pacemakers: asynchronous and synchronous (IITRI 1979). The asynchronous pacemaker pulses at a predetermined rate. It is practically immune to interference because it has no sensing circuitry and is not exceptionally complex. The synchronous pacemaker, on the other hand, pulses only when its sensing circuitry determines that pacing is necessary. The concern is that interference could result from transmission line electric or magnetic fields, and cause a spurious signal in the pacemaker's sensing circuitry (Sastre 1997). However, when these pacemakers detect a spurious signal, such as an induced 60 Hz current, they are programmed to revert to an asynchronous or fixed pacing mode of operation and return to synchronous operation within a specified time after the signal is no longer detected. The issue for pacemakers is if transmission line fields could adversely affect their operation.

The potential for pacemaker interference due to high voltage transmission line fields depends on the manufacturer, model, and implantation method, among other factors. Studies have determined thresholds for interference of the most sensitive units to be about 2,000 to 12,000 mG for magnetic fields and about 1.5 to 2.0 kV/m for electric fields (University of Rochester 1985). The electric and magnetic fields at the right-of-way edge are below these values, but on the right-of-way the electric field threshold can be exceeded. The electric fields on the right-of-way are also above the limit value of 1 kV/m suggested for occupational exposure to electric fields (ACGIH 1999). It is unclear that reversion to a fixed pacing mode is harmful since pacemakers are routinely put into reversion with a magnet to test operation and battery life. Some new pacemaker models are dual chamber devices that can be more sensitive to external interference. Some of these dual chamber units may experience inappropriate pacing behavior (prior to reversion to fixed pacing mode) in electric fields as low as 1.2-2 kV/m, while other models appear unaffected in fields up to 20 kV/m.

The biological consequences of brief, reversible pacemaker malfunction are mostly benign. An exception would be an individual who has a sensitive pacer and is completely dependent on it for maintaining all

cardiac rhythms. For such an individual, a malfunction that compromised pacemaker output or prevented the unit from reverting to the fixed pacing mode, even brief periods of interference, could be life-threatening (Sastre 1997:8-2). The precise coincidence of events (i.e., pacer model, field characteristics, and biological need for full function pacing) would generally appear to be a rare event.

Human Health Studies and Electric and Magnetic Field Standards

There has been public concern over the potential for exposure to EMF to adversely affect human health. The consensus among the medical and scientific communities is that there is insufficient evidence to conclude that EMF causes adverse health effects. Neither the medical nor scientific communities have been able to provide any foundation upon which federal or state regulatory bodies could establish a standard or limit for exposure that is known to be either safe or harmful. The Falcon to Gonder project would produce electric and magnetic fields that are typical of other similar transmission lines already in operation (with similar line design, loading, and voltage classification characteristics). However, there are no federal or state standards related to the human health effects from electric and magnetic fields to serve as a basis for determining a level of impact.

There are no EMF standards for the state of Nevada for transmission line fields. However, a number of other states have set some type of electric or magnetic field limit. In addition, other organizations have established field exposure standards or guidelines. Existing EMF guidelines or limits are summarized in Tables 3.10-6 through 3.10-8. The calculated electric field of 1.15 kV/m at the right-of-way edge and 4.55 kV/m maximum within the right-of-way for the proposed Falcon to Gonder 345 kV transmission line would comply with most existing standards from other states. The calculated magnetic field of 15.4 mG at the right-of-way edge (under maximum loading) for the proposed Falcon to Gonder 345 kV transmission line would comply with other state standards. Both calculated electric and magnetic field levels are well below the guidelines established by the American Conference of Governmental Industrial Hygienists (1999) and the International Commission on Non-Ionizing Radiation Protection (1998).

Corona

Because power loss is uneconomical and noise is undesirable, corona on transmission lines has been studied by engineers since the early part of this century. Many excellent references exist on the subject of transmission line corona (e.g., EPRI 1982). Consequently, corona is well understood by engineers and steps to minimize it are one of the major factors in transmission line design. Corona is a design consideration for transmission lines rated at 345 kV and higher. A corona design feature of the proposed 345 kV transmission line is the use of large-diameter bundled subconductors and corona rings at hardware attachment points, which lower the electrical stress on the air at the conductor surface so that corona activity is at low levels under most operating conditions.

❑ ***Impact Public Health and Safety-5: Potential EMF and Electrical Effects from Transmission Line***

The Falcon-Gonder 345 kV transmission line would be designed to comply with the National Electrical Safety Code. Therefore, the project should not create significant or unusual impacts in areas such as electric and magnetic fields, corona, fuel ignition, fires, lightning, or visible light. Therefore, no special mitigation is required.

The electric and magnetic field levels found under normally operating high voltage lines, including the proposed 345 kV transmission line, do not produce adverse effects in livestock or wildlife, and no significant adverse effects on plants or crops have been identified. The transmission line would comply with NESC requirements limiting induced currents on objects to 5 mA or less. SPPC would properly ground all metallic fences that parallel the proposed transmission line for more than 500 feet and are located within 150 feet of the centerline. Grounding would also include large metal buildings and other types of objects.

The shield wires of the proposed Falcon-Gonder 345 kV transmission line are designed to intercept and safely conduct lightning to ground. Therefore, the transmission line would actually protect the area near it from lightning. In the unlikely scenario where someone was outdoors during a lightning storm and was simultaneously touching a transmission line structure at the exact moment of a lightning strike to a tower, the person may receive a hazardous shock.

There are no EMF standards for the state of Nevada for transmission line fields. The calculated electric and magnetic field at the right-of-way edge and within the right-of-way would comply with most existing standards from other states, and are well below the guidelines established by the ACGIH and the ICNIRP (see Tables 3.10-6 through 3.10-8). The consensus among the medical and scientific communities is that there is insufficient evidence to conclude that EMF causes adverse health effects. There are no federal or state standards related to the human health effects from electric and magnetic fields to serve as a basis for determining a level of impact.

The potential for pacemaker interference from transmission line fields depends on the manufacturer, model, and implantation method, among other factors. For individuals with pacemakers or similar implanted medical devices, the electric and magnetic fields at the right-of-way edge are below typical interference values, but on the right-of-way the electric field interference threshold can be exceeded; they are also above the limit value of 1 kV/m suggested for occupational exposure to electric fields (ACGIH 1999). Some new pacemaker models are dual chamber devices that can be more sensitive to external interference and may experience inappropriate pacing behavior. The biological consequences of brief, reversible pacemaker malfunction are mostly benign. An exception would be an individual who has a sensitive pacer and is completely dependent on it for maintaining all cardiac rhythms. For such an individual, a malfunction that compromised pacemaker output or prevented the unit from reverting to the fixed pacing mode, even brief periods of interference, could be life-threatening (Sastre 1997:8-2). The precise coincidence of events (i.e., pacer model, field characteristics, biological need for full function pacing) would generally appear to be a rare event.

A significant amount of research has been done on electric and magnetic field mitigation options (Silva 1999). For the electric and magnetic field effects from the proposed 345 kV transmission line, mitigation efforts could include: wider right-of-way, taller structures, delta (triangular) phase configuration or passive shielding. However, these measures may not be necessary for the project and are not recommended at this time.

Alternative-Specific Impacts

Potential project impacts related to fire management, hazardous materials, and electric and magnetic fields would be essentially the same for all of the route alternatives. There are no additional alternative-specific impacts.

Summary Comparison of Route Alternatives

TABLE 3.10-12: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Health and Safety-1: Potential Fire Hazards Related to Construction, Operation and Maintenance	X	X	X	X	X
Impact Health and Safety-2: Potential Fire Hazard from Energized Transmission Line	X	X	X	X	X
Impact Health and Safety-3: Potential Fire Hazards Related to Cheatgrass	X	X	X	X	X
Impact Health and Safety-4: Potential Health and Safety Impacts from Hazardous Materials	X	X	X	X	X
Impact Health and Safety-5: Potential EMF and Electrical Effects from Transmission Line	X	X	X	X	X

RESIDUAL IMPACTS

Discussion of residual fire impacts related to ground disturbance, vegetation and cheatgrass is contained in Section 3.4, Vegetation. No significant residual public health and safety impacts are anticipated.

NO ACTION ALTERNATIVE

Under the No Action Alternative, potential public health and safety impacts associated with this project would not occur. However, similar impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

3.11 NOISE

"Noise" is generally defined as unwanted sound. The effects of noise on people range from annoyance and inconvenience to temporary or permanent hearing loss. Since the human ear is not equally sensitive to sound at all frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. Sound wave intensity is measured in decibels (dB). An A-weighted dB (dBA) scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This A-weighted dB scale has been chosen by most authorities for purposes of environmental noise regulation.

Typical sounds in most communities range from 40 dBA (very quiet) to 100 dBA (very loud) or higher. Conversation is roughly 60 dBA at 3 to 5 feet. As background noise levels exceed 60 dBA, speech intelligibility becomes increasingly difficult. Noise becomes physically discomforting at 110 dBA. The above sound levels are stated in terms of short-term maximum sound. Some typical noise levels are given in the following table:

TABLE 3.11-1: TYPICAL SOUND LEVELS FOR COMMON SOURCES IN A-WEIGHTED DECIBELS

Source/Location	Sound Level
Threshold of Hearing	0 dBA
Motion Picture Studio - Ambient	20 dBA
Library	35 dBA
Chicago Suburbs – nighttime minimum	40 dBA
Wind in Deciduous Trees (2-14 mph)	36-61 dBA
Falling Rain (Variable Rainfall Rates)	41-63 dBA
Tomato Field on California Farm	44 dBA
Small Town/Quiet Suburb	47-53 dBA
Private Business Office	50 dBA
Light Traffic at 100 ft Away	50 dBA
Average Residence	50 dBA
Large Retail Store	60 dBA
Accounting Office	60 dBA
Boston - Inside House on Major Avenue	68 dBA
Average Traffic on Street Corner	75 dBA
Inside Sports Car (50 mph)	80 dBA
Los Angeles - ¾ mile from Jet Landing	86 dBA
Inside New York Subway Train	95 dBA
Loud Automobile Horn (at 1 m)	115 dBA

Source: EPA 1974, IEEE 1974, Miller 1978

Additional units of measurement have been developed to evaluate the long-term characteristics of sound. The equivalent noise level (L_{eq}) is a single-number representation of the fluctuating sound level in decibels over a specified period of time. The L_{eq} of a time-varying sound is equivalent or equal to the level of a constant unchanging sound.

Other noise descriptors include L_{10}, L_{50}, and L_{90}. These descriptors indicate what percentage of time a certain noise level would be exceeded. For example, a L_{50} of 65 dBA indicates that 50% of the time, noise levels would be greater than 65 dBA at a certain location.

A number of government agencies have adopted the day-night averaged noise level or L_{dn} as their noise metric to evaluate noise compatibility. The L_{dn} represents a time-weighted 24-hour average noise level based on the A-weighted decibel. "Time-weighted" refers to the fact that noise occurring during certain sensitive time periods (nighttime, when other background sounds are relatively subdued) is adjusted for occurring at those times. L_{dn} includes an additional 10 dBA adjustment for noise events occurring during nighttime (10 p.m. to 7 a.m.). In effect, the L_{dn} is roughly equivalent to the L_{eq} over a 24-hour period, with "penalties" added to noise events occurring late at night and early in the morning. A 10 dBA change in noise level is perceived by most people as a doubling of sound level. The smallest perceivable change in noise levels is 3 dBA. An increase of 5 dBA is more clearly noticeable by the human ear.

The U.S. Environmental Protection Agency (EPA) has an outdoor activity noise guideline of 55 dBA (EPA 1974). This value represents the sound energy averaged over a 24-hour period; it has a 10 dBA nighttime weighting (between 10:00 p.m. and 7:00 a.m.) (EPRI 1982).

Ambient, or background noise, is the all-encompassing noise associated with a given environment (usually a composite of sounds from many near and far sources). Outdoors, average nighttime ambient noise is, in general, lower than daytime ambient levels by approximately 5 dB. This difference, however, is widely affected by the characteristics of the area and environment. Ambient noise is usually most critical at nighttime during the summer, when people are resting, windows are often left open, and traffic noise is usually at a minimum. Average ambient daytime and nighttime sound levels for various types of neighborhoods are presented in Table 3.11-2.

TABLE 3.11-2: AVERAGE AMBIENT SOUND LEVELS

Type of Neighborhood	A-Weighted Ambient Sound Level (dBA)	
	Day	Night
Rural	35	35
Residential Suburban	40	35
Residential Urban	45	35
Commercial	50	35
Industrial	50	50

Operation of high voltage transmission lines and electric substation equipment can create audible noise. Transmission lines can generate a small amount of sound energy during corona activity. This audible noise from the line can barely be heard in fair weather conditions on higher voltage lines. During wet weather conditions, water drops collect on the conductor and increase corona activity so that a crackling or humming sound may be heard near the line. This noise is caused by small electrical discharges from the water drops. Audible noise would decrease with distance away from the transmission line. For substations, electrical transformers are generally the main source of audible noise (other than the associated transmission lines). Public concerns can develop concerning audible noise from electrical facilities in proximity to residences.

3.11.1 AREA OF ANALYSIS AND METHODOLOGY

The area of analysis for noise impacts consists of a 500-foot wide study corridor along the five route alternatives. Three representative transmission line configurations in the study area were selected to estimate project noise impacts:

1. Proposed 345 kV transmission line alone (e.g., along Segment C).
2. Proposed 345 kV transmission line paralleling existing 66/25 kV and 120 kV transmission lines (e.g., along Segment B near Crescent Valley).
3. Proposed 345 kV transmission line paralleling an existing 230 kV transmission line (e.g., along Segment J north of Ely).

Figures 3.11-1 through 3.11-3 show diagrams of these transmission line configurations, while Figure 3.11-4 shows the locations where baseline noise measurements were taken. Configuration #1 was chosen to reflect conditions in undeveloped areas with very few houses. Configurations #2 and #3 were chosen to reflect conditions near existing transmission lines and highways.

For Configuration #1, existing noise levels were measured near the Segment C southeast of Beowawe. For Configuration #2, noise measurements were taken along Segment B near local residences outside of Crescent Valley (i.e., at the edge of the proposed right-of-way at station marker 69 + 09 : #5724). For Configuration #3, measurements were made near residences along Segment J northwest of Ely (i.e., at the edge of the proposed right-of-way near Hercules Gap). Measurements were conducted at the proposed 345 kV transmission line right-of-way edge at a 1.5-meter microphone height in accordance with Institute of Electrical and Electronics Engineers (IEEE) standards (IEEE 1992).

The project also includes the installation of additional facilities at the existing Falcon and Gonder substations. The Falcon 345/120 kV substation would have new electrical equipment installed but is not near any local residences. The Gonder 230/69 kV substation does have a few local residences nearby. The closest house just north of the substation is owned by SPPC and is intended for use by their personnel and construction contractors. The substation would be upgraded to 345 kV. New 230 kV buswork would be required to connect to the existing 230 kV ring bus. New equipment includes two 230 kV power circuit breakers, two 345/230 kV- 300 MVA transformers, two 345 kV power circuit breakers, and two 345 kV reactors to control voltage.

The Gonder substation pad and fenced area would require an approximate 6.2-acre expansion. Figures 2-5 and 2-7 in Chapter 2 show the existing and proposed configurations for the Gonder substation. The new 345/230 kV transformers would be located near the present northern property line boundary.

METHODOLOGY

Field measurements and calculations of estimated noise levels were performed by Enertech, Inc. (2000). Baseline audible noise measurements were recorded along the transmission line routes for each of the three line configurations and at the Gonder substation to identify existing conditions (see Figures 3.11-4 through 3.11-9). For general sound level measurements, a precision integrating sound level meter was used (Bruel & Kjaer Type 2236). A sound level meter consists basically of a microphone, a set of frequency weightings that alter the relative importance of the frequencies of a complex sound, an amplifier, and an RMS indicating instrument.

The standardized weighting networks are denoted A and C, with octave bands. The A weighting, most commonly used in transmission line and transformer sound measurements, approximates the human ear's response by attenuating the response of the meter to frequencies below 1 kHz. The C weighting inserts somewhat less attenuation at lower frequencies and provides a flatter response. The octave band permits measurement of the level of a very narrow range of frequencies and thus allows an accurate analysis of the noise composition.

FIGURE 3.11-1: CONFIGURATION #1: PROPOSED 345 KV TRANSMISSION LINE ALONE

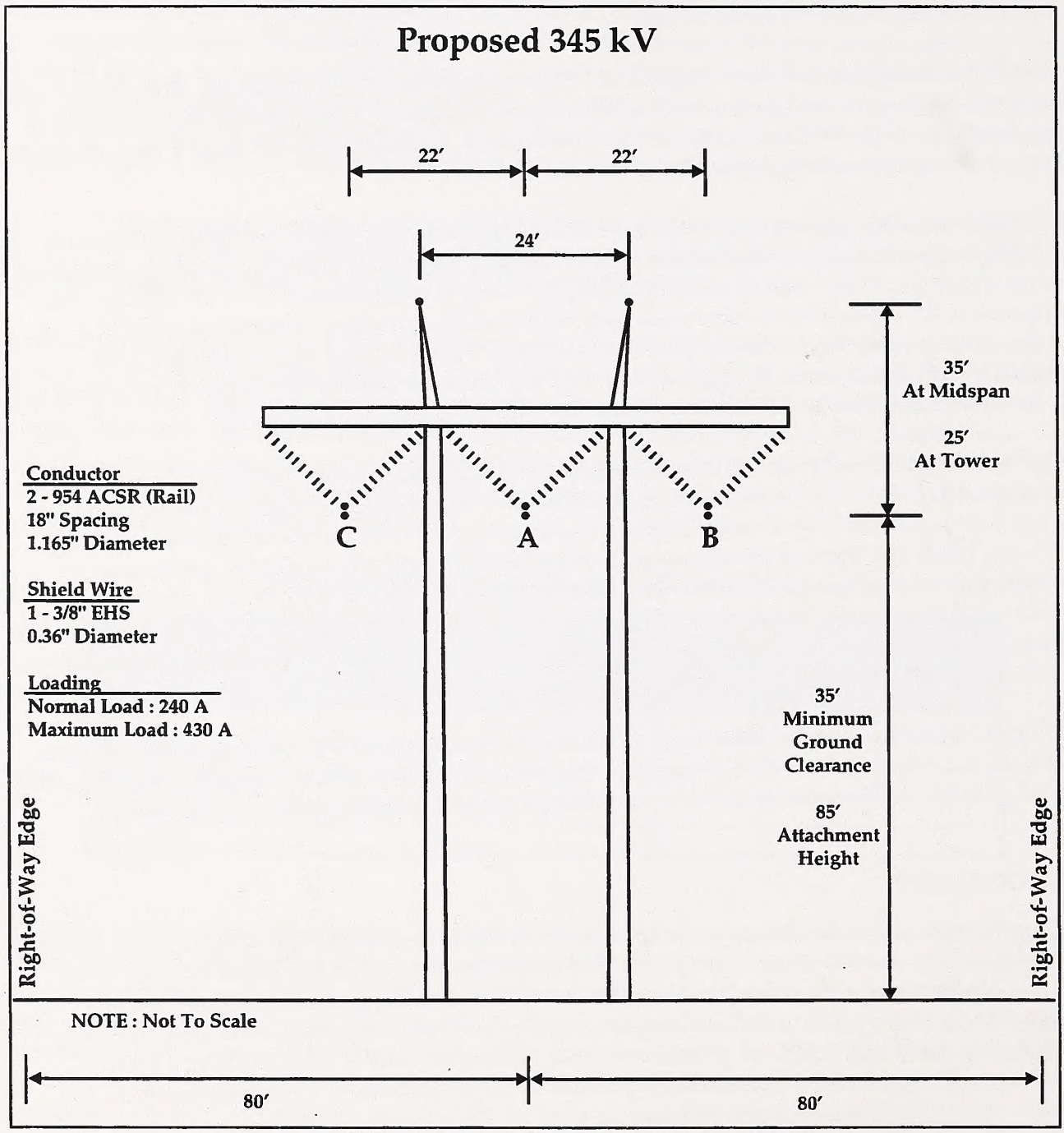


FIGURE 3.11-2: CONFIGURATION #2: PROPOSED 345 KV TRANSMISSION LINE PARALLELING EXISTING 66/25 KV AND 120 KV TRANSMISSION LINES

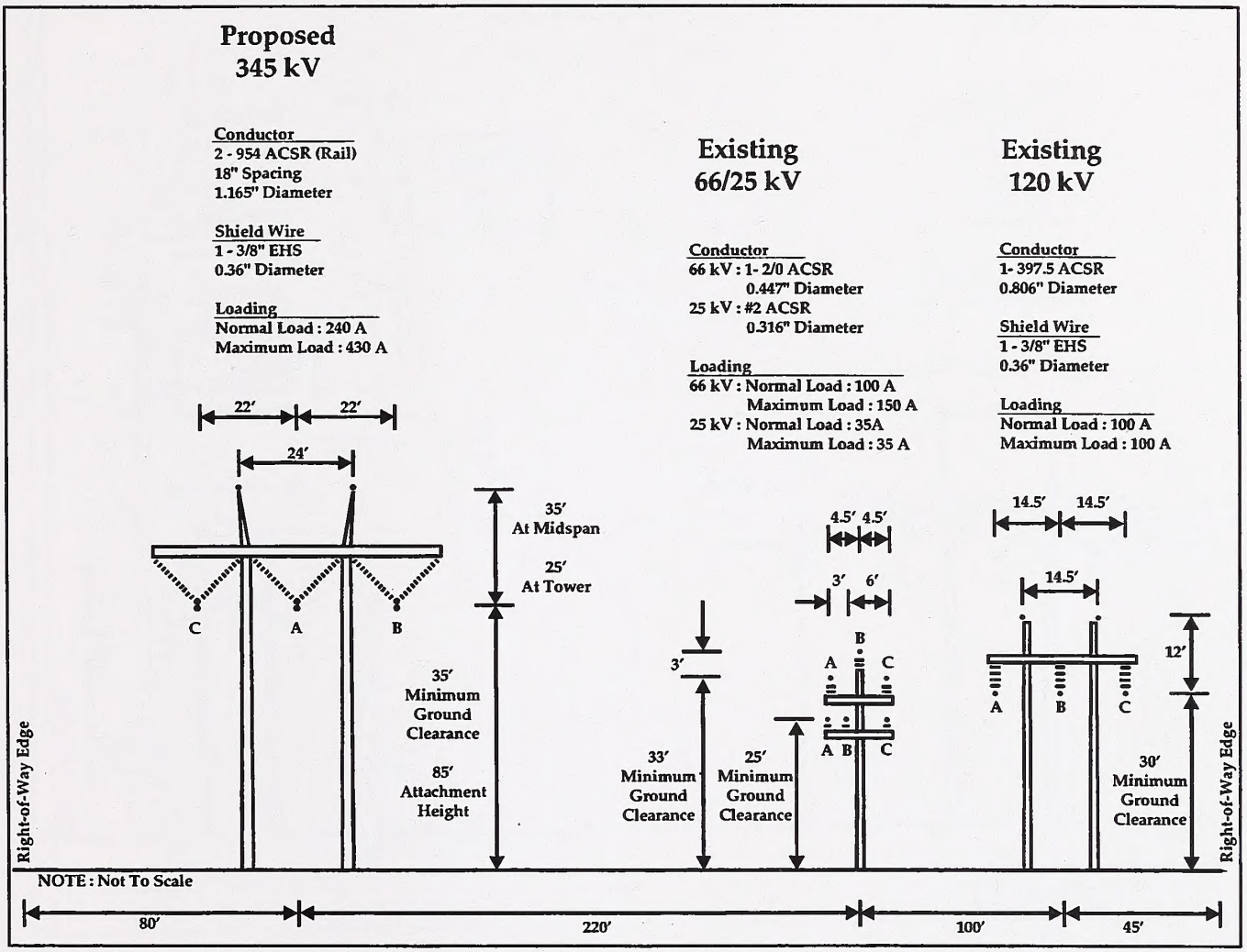


FIGURE 3.11-3: CONFIGURATION #3: PROPOSED 345 KV TRANSMISSION LINE PARALLELING EXISTING 230 KV TRANSMISSION LINE

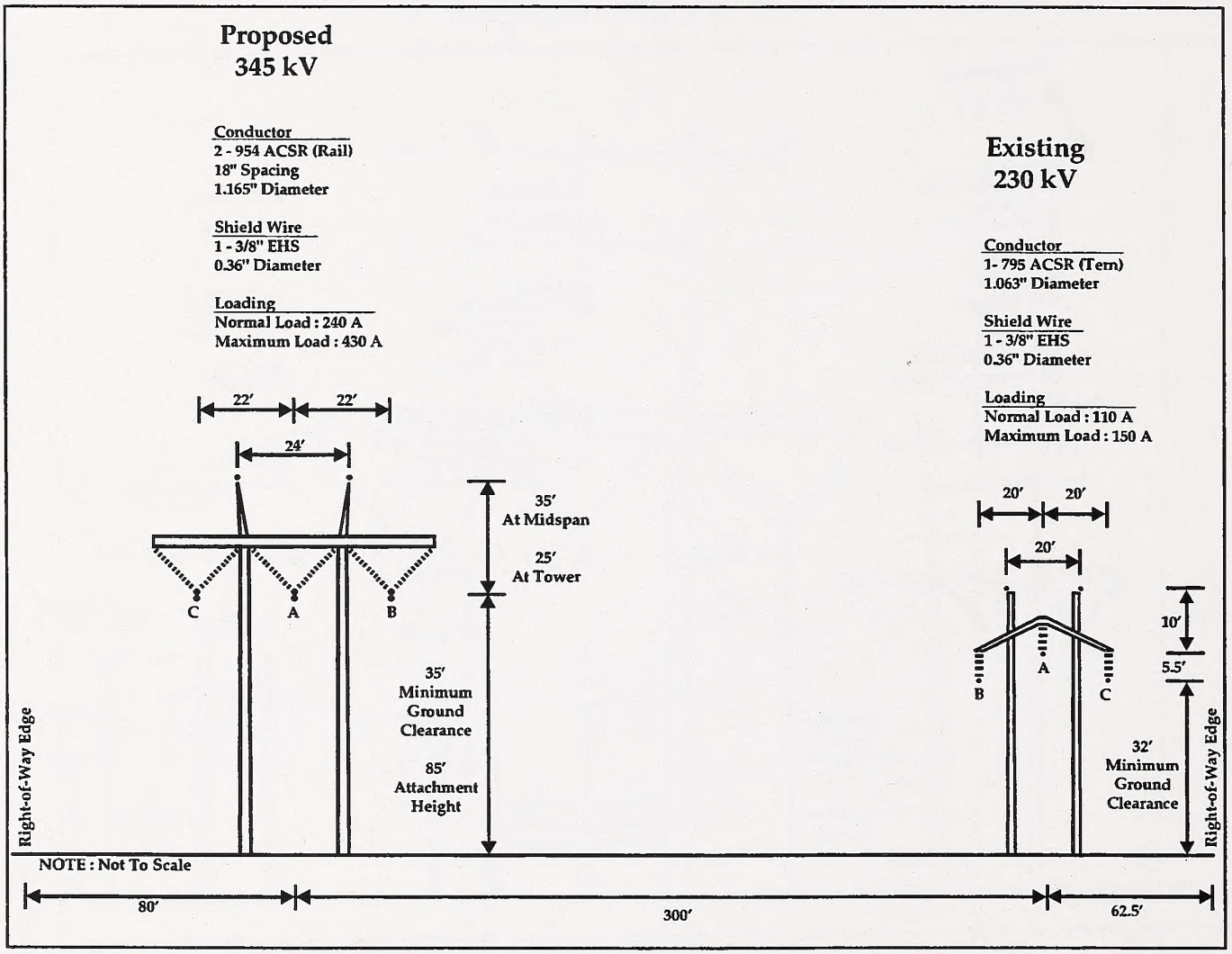


FIGURE 3.11-4: BASELINE NOISE MONITORING LOCATIONS

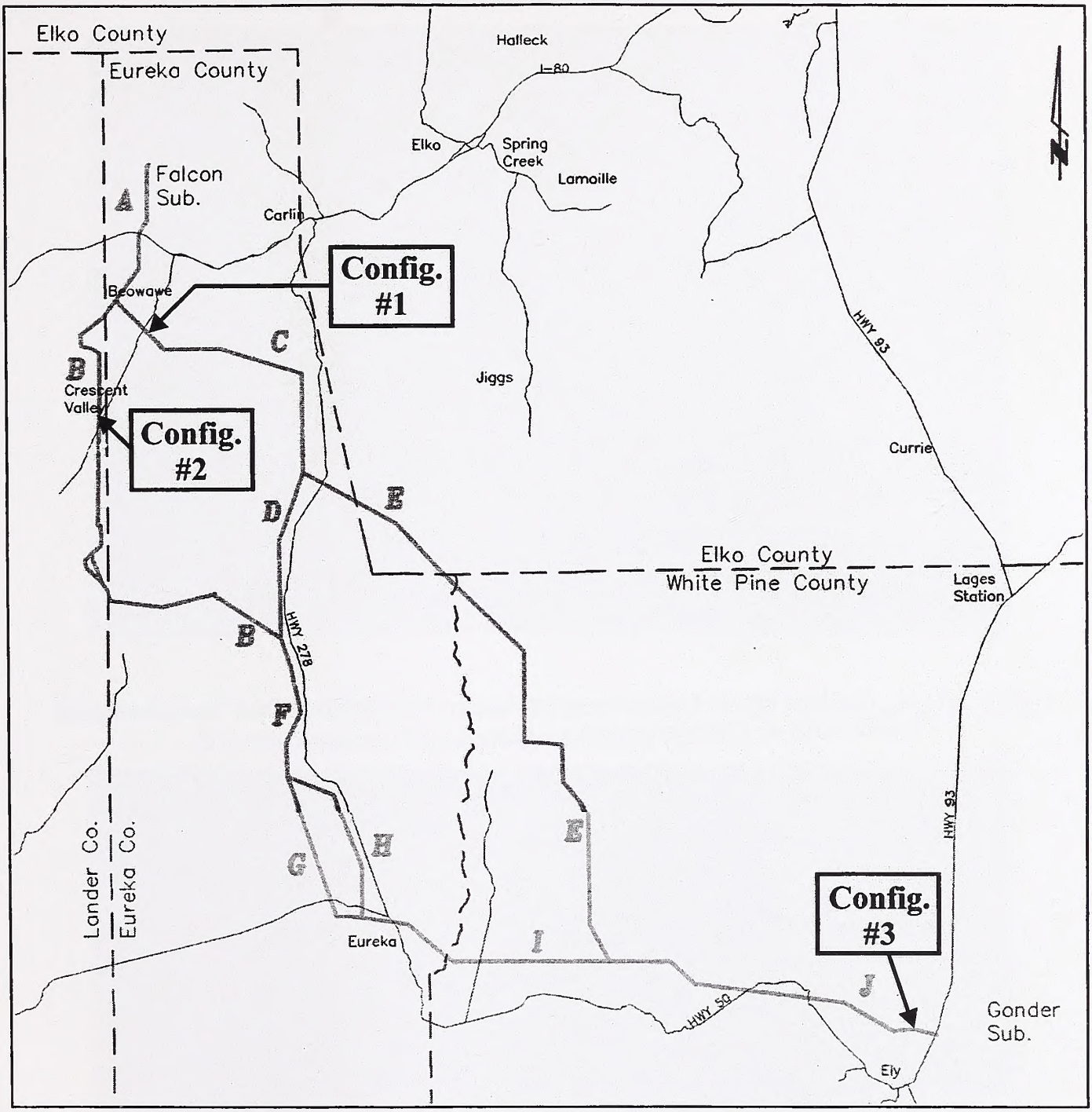


FIGURE 3.11-5: AUDIBLE NOISE MEASUREMENTS ALONG PROPOSED 345 KV TRANSMISSION LINE ROUTE SOUTHEAST OF BEOWAWE, NEVADA (CONFIGURATION #1)

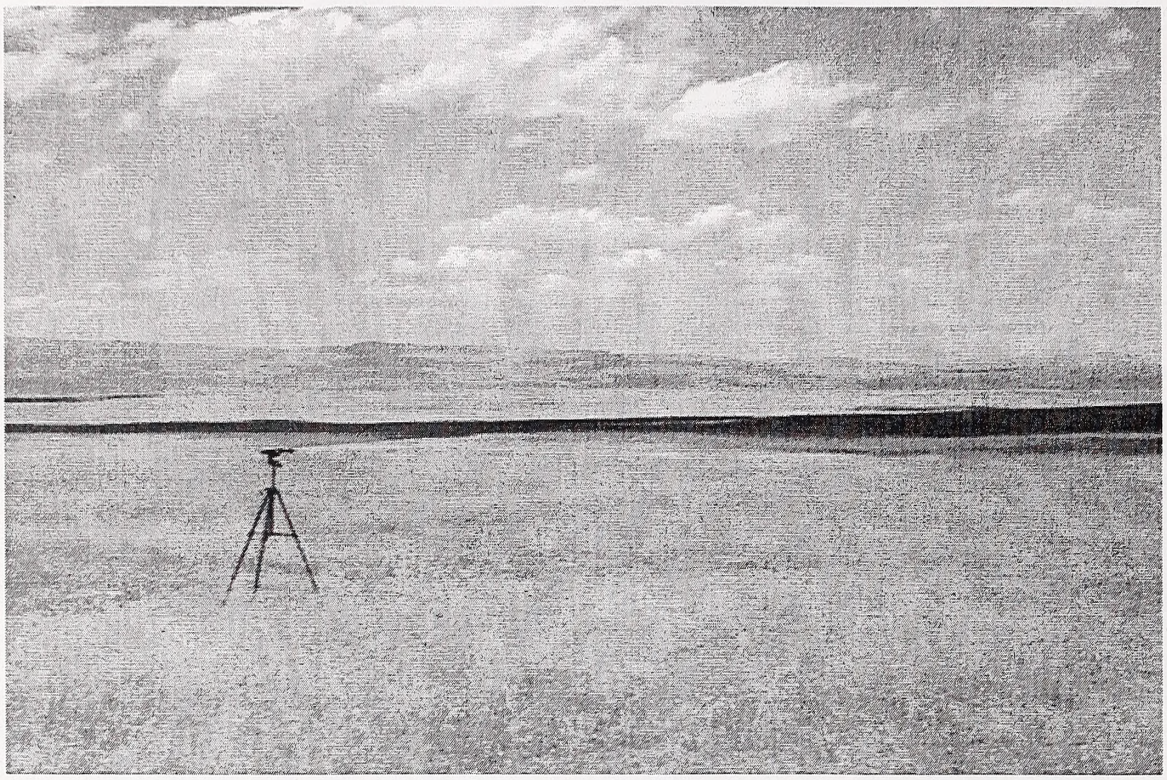


FIGURE 3.11-6: AUDIBLE NOISE MEASUREMENTS ALONG PROPOSED 345 KV TRANSMISSION LINE ROUTE AT CRESCENT VALLEY, NEVADA (CONFIGURATION #2)

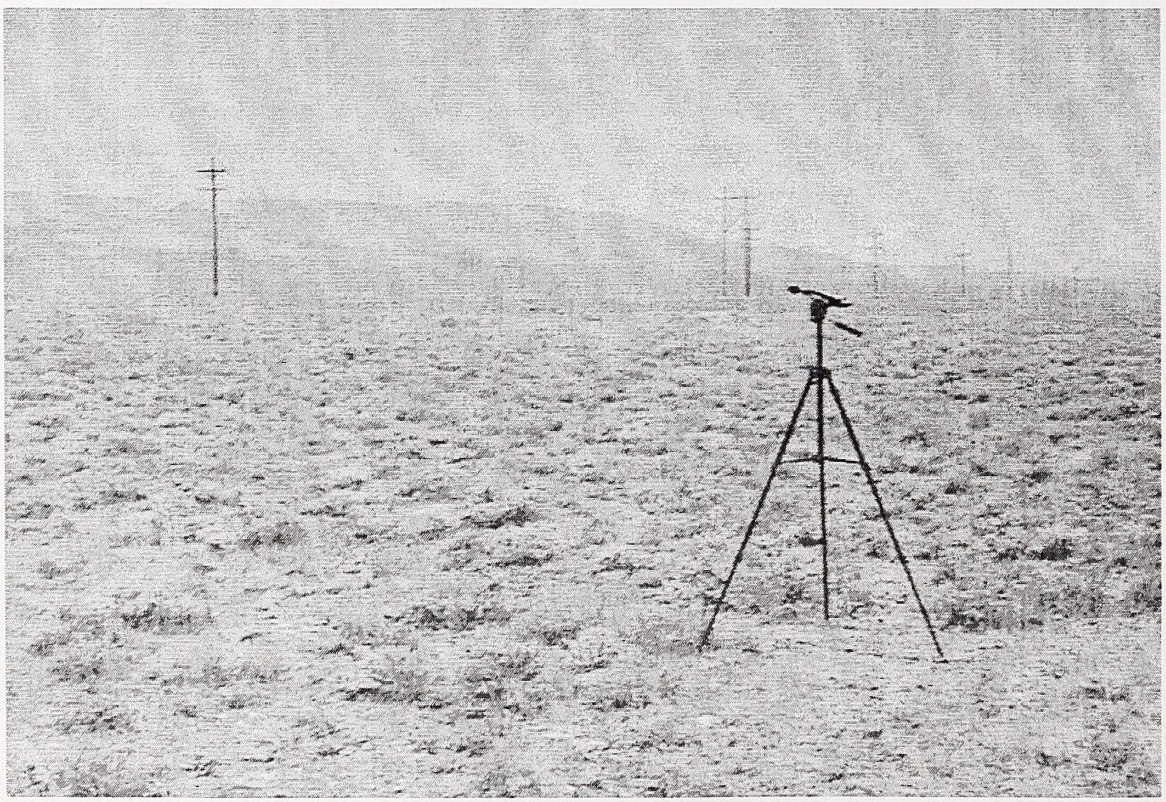


FIGURE 3.11-7: AUDIBLE NOISE MEASUREMENTS ALONG PROPOSED 345 KV TRANSMISSION LINE ROUTE AT ELY, NEVADA (CONFIGURATION #3)

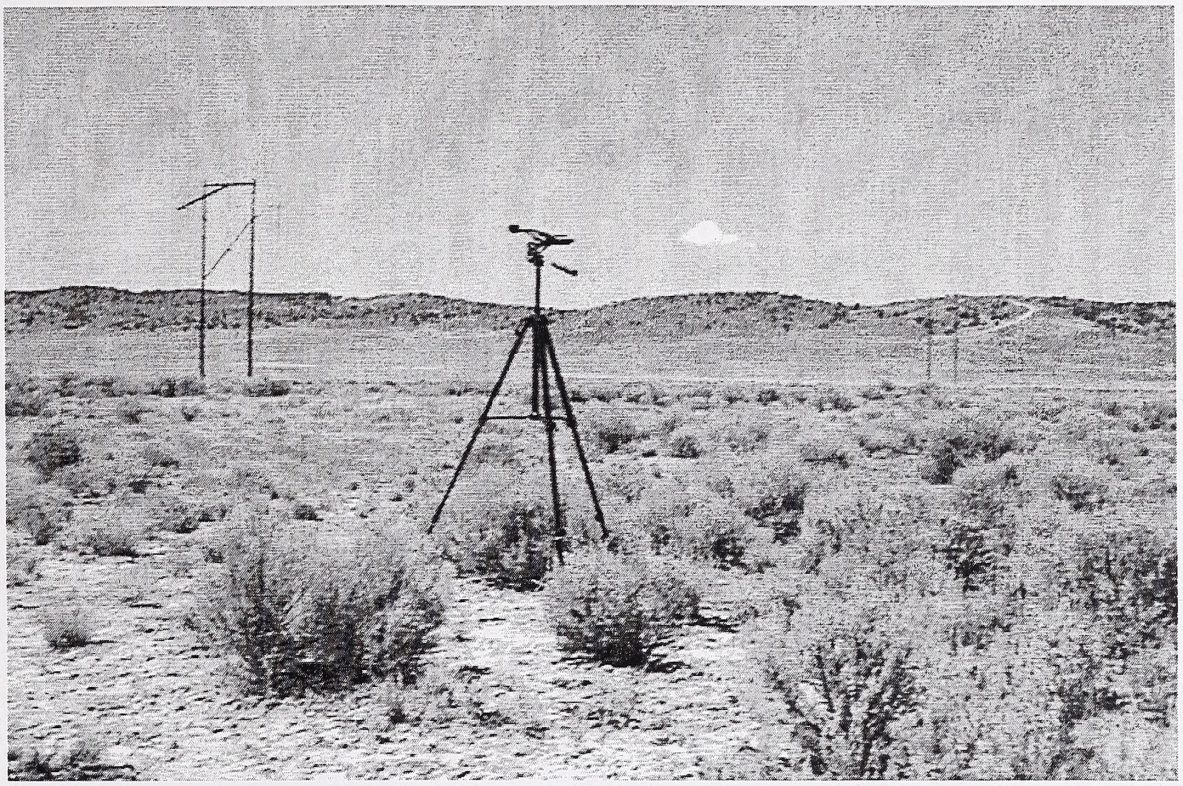


FIGURE 3.11-8: AUDIBLE NOISE MEASUREMENTS OF A 345/125 KV TRANSFORMER AT MIRA LOMA SUBSTATION IN RENO, NEVADA

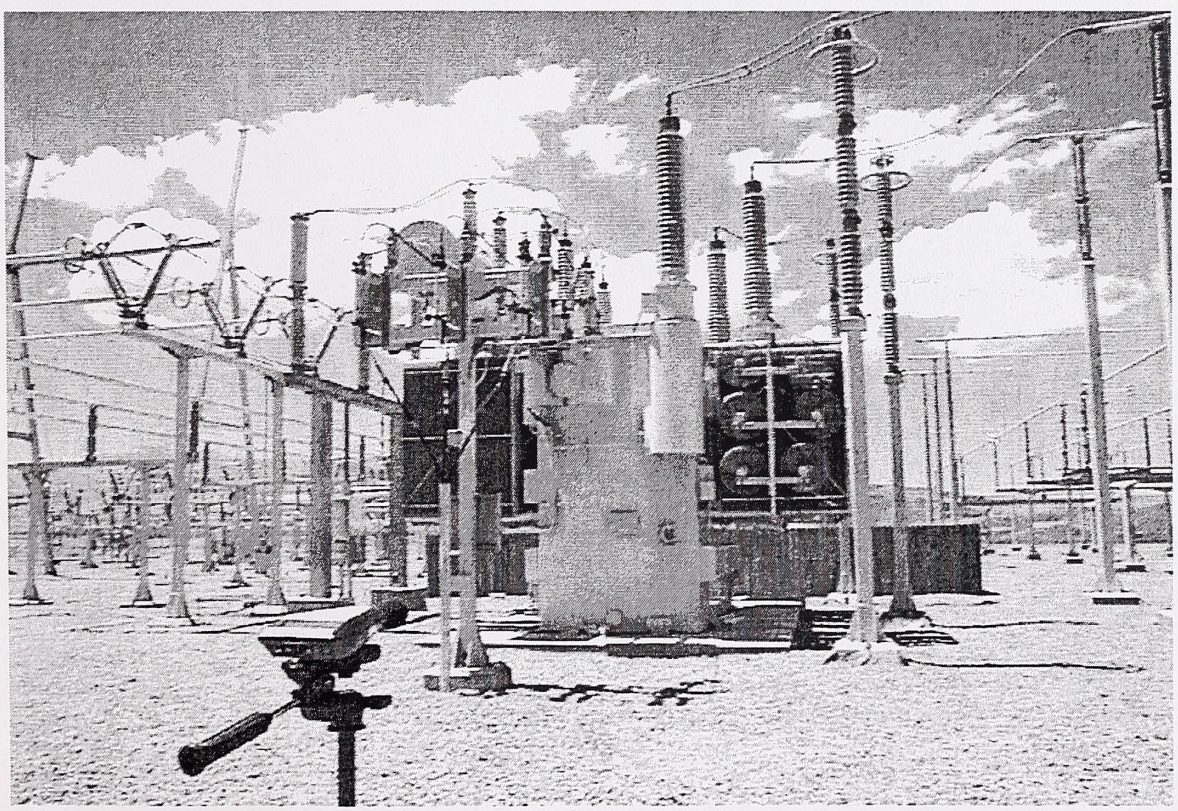
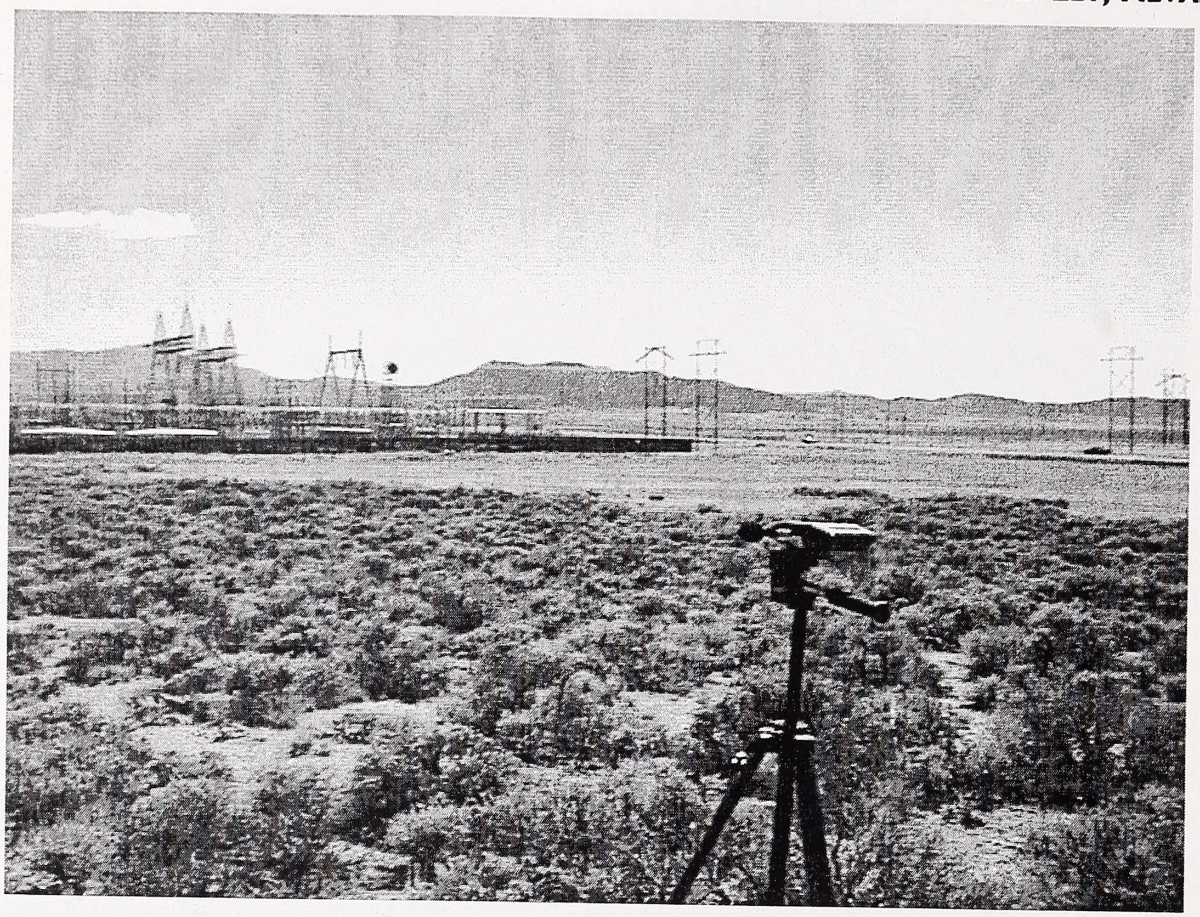
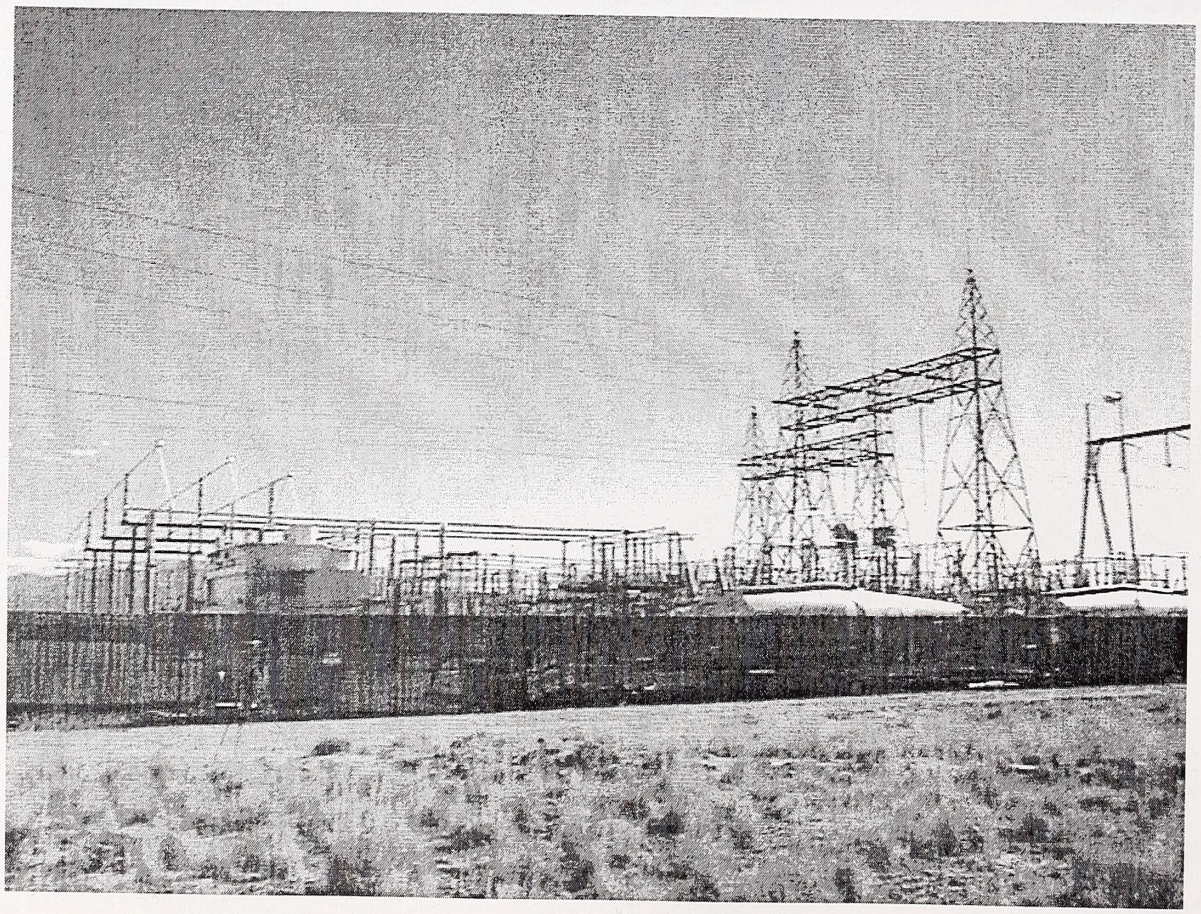


FIGURE 3.11-9: AUDIBLE NOISE MEASUREMENTS AT GONDER SUBSTATION IN ELY, NEVADA





In cases where a transmission line is proposed to be constructed, audible noise values can be calculated using computer modeling software. These programs allow the transmission line configuration information and other parameters to be entered into the program. The software then calculates what the audible noise would be at a defined location, based upon the input data. Computer models have been developed by the Bonneville Power Administration (BPA 1977), and computational results compare well with actual measurement data.

To analyze project impacts, baseline noise measurement data were then combined with the calculated noise values to estimate a resulting audible noise level for the proposed 345 kV transmission line. For the proposed Gonder substation upgrade and expansion, the two main impacts on audible noise would be the addition of two 345/230 kV transformers and the extension of the substation property line toward existing residences. Audible noise lateral profile measurements were conducted around an existing energized 345/125 kV transformer in Reno, Nevada to characterize noise levels from the energized transformer.

Figure 3.11-8 presents a photograph of audible noise lateral profile characterization measurements at the Mira Loma Substation in Reno, Nevada where an energized 345/125 kV transformer was measured. These lateral profile characterization measurements were combined with existing ambient substation measurements (both daytime and nighttime measurements) at the existing substation property line and at the proposed expansion property line to estimate resulting audible noise levels due to the project.

REGULATORY FRAMEWORK

Noise Regulations and Guidelines

A number of government agencies have established noise standards and guidelines to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise. The EPA has identified noise levels affecting health and welfare. One of the functions of their noise standards is to provide guidance for state and local governments when developing their own standards. A 24-hour exposure level of 70 dB has been set to prevent any measurable hearing loss over a lifetime.

In addition, an outdoor level of 55 dB and indoor level of 45 dB was set to ensure there is no activity interference or annoyance. These levels are averages of acoustical energy over long periods of time. They do not correspond to a single event level or peak level. For example, it is permissible to reach levels above 70 dB as long as there is sufficient amount of relatively quite time. Noise levels for various areas depend on the use of the area. A level of 45 dB is set for indoor residential areas, hospitals, and schools, and a level of 55 dB is set for areas of outside human activity.

3.11.2 AFFECTED ENVIRONMENT

The affected area is mostly rural or rural residential. There are no major stationary noise sources along the proposed transmission line segments. Traffic noise is the primary noise source in the area. Noise analyses customarily focus on potential impacts to "sensitive receptors" (i.e., noise-sensitive land uses such as residences, hotels, churches, auditoriums, schools, libraries, hospitals, and parks). To identify potential "sensitive receptors" that could be impacted by project noise, a land use survey was conducted by Stantec in July 2000 using a helicopter and global positioning system.

This survey identified approximately 30 buildings (mostly residences) within 1,000 feet and 280 buildings within 1.5 miles of the Crescent Valley (a) route (as measured from the proposed centerline). The Crescent Valley (b) route has approximately 34 buildings within 1,000 feet and 335 buildings within 1.5

miles. The Pine Valley (a) route has approximately 18 buildings within 1,000 feet and 213 units within 1.5 miles, while the Pine Valley (b) route has about 22 buildings within 1,000 feet and 288 units within 1.5 miles. The Buck Mountain route has about 13 buildings within 1,000 feet and 173 buildings within 1.5 miles. Segments A, B, H, I, and J are the only ones with homes within 1,000 feet of the centerline (Stantec 2000).

EXISTING NOISE

Audible noise measurements were conducted along the proposed 345 kV transmission line route for each of the three possible line configurations. Measurements were conducted on July 18 and 19, 2000 to characterize existing noise levels. Two types of measurements were conducted at each location: (1) a set of spot measurements including the A-scale, C-scale, and selected octave bands; and (2) a 2-hour series of measurements on the A-scale only. Table 3.11-3 presents the results of the spot measurements, while Table 3.11-4 presents the 2-hour series measurements. The presence or absence of wind, and the range of wind speed and gusting winds, contributed significantly to the level of measured audible noise.

TABLE 3.11-3: SPOT MEASUREMENTS OF SOUND LEVELS ALONG PROPOSED 345 KV TRANSMISSION LINE ROUTE (AT THE PROPOSED ROW EDGE)

Configuration/Location/ Date/Time of Day/ Weather Conditions	Existing Measured Audible Noise Sound Levels - dB										
	Scale		Selected Octave Bands								
	A	C	31.5	63	125	250	500	1K	2K	4K	8K
#1 : No Existing Lines Segment "C" (Southeast of Beowawe) July 18, 2000 @ 1:30 PM (88 °, 10 – 12% humidity, 2 – 7 mi/hr winds gusting)	25	59	62	55	43	27	22	13	12	12	15
#2 : Existing 66/25/120 kV Segment "B" (Crescent Valley) July 18, 2000 @ 10:15 AM (84°, 10 – 12% humidity, 2 – 4 mi/hr calm winds)	23	54	50	31	32	16	15	10	10	11	13
#3 : Existing 230 kV Segment "J" (Ely/Hercules Gap) July 19, 2000 @ 11:15 AM (89°, 10 – 12% humidity, 2 – 7 mi/hr winds gusting)	27	60	53	46	32	23	14	13	11	12	13

Measurement Height : 5-Foot

Audible noise measurements were conducted at the existing Gonder substation property line and at the proposed expansion property line (544 feet north of the existing northern property line). Daytime measurements were conducted on July 19, 2000 (3:00 – 5:30 PM) to characterize existing daytime noise levels. Nighttime measurements were conducted on July 20, 2000 (12:00 – 2:30 AM) to characterize existing nighttime noise levels.

TABLE 3.11-4: 2-HOUR MEASUREMENTS OF SOUND LEVELS ALONG PROPOSED 345 KV TRANSMISSION LINE ROUTE (AT THE PROPOSED ROW EDGE)

Configuration/Location/ Date/Time of Day/ Weather Conditions	Existing Measured Audible Noise Sound Levels A-Scale – dBA		
	L50	L90	L10
#1 : No Existing Lines Segment "C" (Southeast of Beowawe) July 18, 2000, 1:30 – 3:30 PM (88°, 10 – 12% humidity, 2 – 7 mi/hr winds gusting)	29	23.5	42
#2 : Existing 66/25/120 kV Segment "B" (Crescent Valley) July 18, 2000, 10:15 AM – 12:15 PM (84°, 10 – 12% humidity, 2 – 4 mi/hr calm winds)	21.5	> 20	30
#3 : Existing 230 kV Segment "J" (Ely/Hercules Gap) July 19, 2000, 11:15 AM – 1:15 PM (89°, 10 – 12% humidity, 2 – 7 mi/hr winds gusting)	24	> 20	43

Range: 20 to 100 dBA
Measurement Height: 5-Feet

Two types of measurements were conducted at each location and for each measurement period: (1) a set of spot measurements including the A-scale, C-scale, and selected octave bands; and (2) a 1-hour series of measurements on the A-scale only. Table 3.11-5 presents the results of the spot measurements, while Table 3.11-6 presents the 1-hour series measurements. Gonder substation is located in proximity to Highway 93. This main highway is a significant source of ambient noise in local area, both during daytime and nighttime measurements.

TABLE 3.11-5: SPOT MEASUREMENTS OF SOUND LEVELS ALONG EXISTING AND PROPOSED GONDER SUBSTATION PROPERTY LINE

Location Description/ Date/Time of Day/ Weather Conditions	Existing Measured Audible Noise Sound Levels – dB										
	Scale		Selected Octave Bands								
	A	C	31.5	63	125	250	500	1K	2K	4K	8K
Existing Property Line July 19, 2000 @ 4:20 PM (90°, 10 – 12% humidity, 2 – 5 mi/hr winds gusting)	49	66	55	61	67	50	41	35	25	20	21
Existing Property Line July 20, 2000 @ 1:20 AM (47°, 10 – 12% humidity, 2 – 4 mi/hr calm winds)	42	56	46	54	57	47	37	28	21	17	18
Proposed Property Line July 19, 2000 @ 3:10 PM (90°, 10 – 12% humidity, 2 – 5 mi/hr winds gusting)	41	59	60	53	56	40	31	23	35	18	13
Proposed Property Line July 20, 2000 @ 12:05 AM (58°, 10 – 12% humidity, 2 – 4 mi/hr calm winds)	40	62	57	51	61	35	33	20	12	12	12

Measurement Height: 5-Feet

TABLE 3.11-6: 1-HOUR MEASUREMENTS OF SOUND LEVELS ALONG EXISTING AND PROPOSED GONDER SUBSTATION PROPERTY LINE

Configuration/Location/ Date/Time of Day/ Weather Conditions	Existing Measured Audible Noise Sound Levels A-Scale – dBA		
	L50	L90	L10
Existing Property Line July 19, 2000, 4:20 – 5:20 PM (90°, 10 – 12% humidity, 2 – 5 mi/hr winds gusting)	50.5	49.5	51.5
Existing Property Line July 20, 2000, 1:20 – 2:20 AM (47°, 10 – 12% humidity, 2 – 4 mi/hr calm winds)	40.5	39.5	42.0
Proposed Property Line July 19, 2000, 3:10 – 4:10 PM (90°, 10 – 12% humidity, 2 – 5 mi/hr winds gusting)	43.5	40.5	52.5
Proposed Property Line July 20, 2000, 12:05 – 1:05 AM (58°, 10 – 12% humidity, 2 – 4 mi/hr calm winds)	36.5	33.5	43.0

Range: 20 to 100 dBA
Measurement Height: 5-Feet

3.11.3 ENVIRONMENTAL CONSEQUENCES

SIGNIFICANCE CRITERIA

Project noise impacts would be considered significant if:

- Project construction activities would result in noticeable (3 dBA or greater) increases in noise levels.
- Project operation would result in an ambient noise level increase of 3 dBA or more at sensitive receptors.

ENVIRNONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to all Route Alternatives

Construction Noise and Ground Vibration Impacts

Construction Equipment Noise

Short-term noise increases associated with the operation of off-highway construction equipment during the construction period would be anticipated on and around the transmission line corridor, substations, and material yards. The EPA has found that the noisiest equipment types operating at construction sites typically range from 88 to 101 dBA at a distance of 50 feet. Table 3.11-7 presents noise levels typically generated by construction equipment.

Noise from localized point sources, such as construction equipment, typically decreases at a rate of approximately 6 dB per doubling of distance from the source. For this analysis, sound levels generated during the various construction activities were estimated based on this noise attenuation rate and the equipment noise levels presented in Table 3.11-7. Assuming the simultaneous operation of the noisiest pieces of equipment, short-term construction-generated noise levels would likely range from a low of

approximately 89 dBA at 50 feet during initial site preparation and final reclamation activities to a high of 91 dBA at 50 feet during tower foundation excavation. Based on these same assumptions, activities occurring at the material yards could generate noise levels of up to 91 dBA at 50 feet.

TABLE 3.11-7: TYPICAL CONSTRUCTION EQUIPMENT SOUND LEVELS

Equipment	Typical Sound Level @ 50 ft (in dBA)
Dump truck	88
Portable air compressor	81
Concrete mixer (truck)	85
Scraper	88
Dozer	87
Paver	89
Generator	76
Rock drill	98
Pump	76
Pneumatic tools	85
Backhoe	85

Source: EPA 1974.

Assuming maximum construction-generated noise level of 91 dBA at 50 feet and an average exterior or interior structural attenuation of 15 dBA, inhabitants of residential dwellings within approximately 2,000 feet of the construction areas and material yards could experience increases in ambient noise levels of greater that 10 dBA. If construction activities occur during the more noise-sensitive periods of the day (i.e., evening and nighttime hours), resultant increases in ambient noise levels could result in sleep disruption to occupants of these residential dwellings. Because the project does not restrict construction activities to the less noise-sensitive hours of the day, construction-generated noise would be considered to have a major short-term impact to nearby noise-sensitive land uses.

Project-related construction would generate heavy-duty truck traffic during the various construction periods. Generally, long-term traffic noise levels along roadways would not noticeably increase until a substantial number of additional vehicle trips occur. Noticeable increases of 3 dBA (CNEL/L_{dn}) often require a doubling of roadway traffic volumes. However, high single-event noise exposure would increase with the increased volumes of heavy-duty truck traffic along local truck routes and the ROW associated with construction activities. Although these events could result in noticeable annoyance, they would not be considered significant noise impacts because they would not cause average daily noise levels to exceed 60 dBA (Ldn/CNEL) at the outdoor areas of residential or other noise-sensitive land uses. Construction-related traffic would be a short-term impact on local roadways and along the ROW during the 15 months of construction. As a result, short-term increases in traffic noise would be considered a minor impact.

Helicopters would be used to pull the sock line along the entire route and to deliver tower and transmission line equipment to isolated areas that are inaccessible by land travel. Most of these locations would be far removed from concentrations of residential or other noise sensitive land uses, but the few scattered residences near the transmission line construction areas would experience some helicopter noise. Flyby noise would also occur in transit between the staging areas and tower sites. Since noise from the use of helicopters during construction would be short-term, this would be a minor impact.

❑ ***Impact Noise-1: Short-term Construction Noise***

Construction activities associated with the transmission line and substation upgrades would result in temporary noise impacts. Noise would be generated by blasting, construction equipment, and also vehicle trips associated with construction activities. Assuming a maximum

noise level of 91 dBA at 50 feet, construction activities occurring during the more noise-sensitive periods of the day (i.e., evening and nighttime hours) may result in potential sleep disruption to occupants or residential dwelling located within approximately 2,000 feet of the construction sites and material yards, and within 3,000 feet of blasting areas. This would be considered a significant, but short-term noise impact.

❑ ***Mitigation Measure Noise-1***

Noise control practices would be implemented during construction of the project by the construction contractors. Specific mitigation measures include:

- In areas adjacent to sensitive receptors (e.g., residences within 2,000 feet of construction sites and material yards, and within 3,000 feet of blasting areas), SPPC's construction contractors would be required to limit noisy demolition and construction activities to Monday through Saturday from 7:00 a.m. to 7:00 p.m. The specified hours of construction would not apply to construction work that does not substantially exceed exterior ambient noise levels as measured 10 feet from the exterior property line of the sensitive receptor. It also does not apply to driving on access roads.
- Construction equipment shall be equipped with mufflers. Prior to the use of construction equipment on the construction sites, the contractor shall demonstrate to the BLM Environmental Monitor that construction equipment that would be used on the project site is equipped with manufacturer recommended mufflers or equivalent mitigation.

Blasting

In addition to noise generated by equipment, construction of the tower foundations may require blasting for the removal of large boulders. Unlike equipment noise, which is based on units of A-weighted decibels and represents the root-mean-square energy value of the noise, the units used to describe blast noise are typically C-weighted peak values (dBC_{peak}). The C-weighting is used to more closely approximate the human perception of low frequency sound that is experienced with louder noise, such as blasting. The "peak" value is used to characterize impulse events of short duration (typically less than 0.5 second).

No standard criteria have been established for assessing impacts associated with impulse noise, such as blasting. However, a number of sources are available to assess the effects that blasting activities would have on nearby land uses, as identified below (Greene 1997).

Noise levels generated by blasting activities are dependent on a number of factors, including the type and amount of explosive used, the depth of the explosive is placed, the material within which the explosive is placed, and meteorological conditions. Maximum noise levels generated by large blasting operations (e.g., 375 pounds of explosive per blast) have been measured at approximately 120 dBC_{peak} (Greene 1997). Noise levels generated by smaller blasting activities, such as the blasting of boulders, would be anticipated to result in noise levels substantially less than 120 dBC_{peak}. In comparison to the various thresholds established for land use compatibility and human safety (as identified in Table 3.11-8), intermittent noise levels of less than 120 dBC_{peak} would not result in damage to nearby structures nor result in a threat to public health and safety. However, depending on the distance to nearby land uses, impulse noise may result in a short-term (i.e., less than 0.5 second) increase in ambient noise levels. Increases exceeding the background noise by more than approximately 10 dB are potentially startling or sleep disturbing. If blasting activities occur during the more noise-sensitive periods of the day (e.g., evening and nighttime hours), resultant noise levels would likely result in increased annoyance and potential sleep disruption to occupants of the nearby residences located within approximately 3,000 feet of the site.

TABLE 3.11-8: BLASTING NOISE THRESHOLDS

IMPULSE NOISE THRESHOLDS		
Threshold (dB_{peak})	Threshold Descriptor	Source
154	Window Testing Threshold	Industry Standard
145	Window Breakage Threshold	U.S. Bureau of Mines
136.5	Noise/Land Use Compatibility; Damage Claim Threshold	U.S. Department of Army
140	Occupational Exposure	U.S. Dept. of Health and Human Services; OSHA
145 – 167	Hearing Loss Threshold (Dependent on Duration of Exposure)	Committee on Hearing and Bio-Acoustics

Sources: U.S. Dept of Health and Human Services (2001); Greene (1997); EPA (1974)

Ground-borne Vibration

Construction activities create seismic waves that radiate along the surface of the earth and down into the earth. These surface waves can be felt as ground vibration. Ground vibration can result in effects ranging from annoyance of people to damage of structures. The rate or velocity at which these particles travel, inches-per-second, is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (ppv).

There are no regulatory standards pertaining to ground-borne vibration and noise. The architectural damage risk level typically suggested by most agencies is 0.2 inches per second (in/sec) for continuous vibration. The U.S. Bureau of Mines (USBM) has established thresholds that can be applied to determine architectural damage risks associated with impulse vibration, such as those generated during blasting. For impulse vibrations at low frequencies, threshold velocities of ground vibration are restricted to lower levels. As vibration frequency increases, higher threshold velocities are allowed. Based on thresholds established by the USBM, the architectural damage risk levels would range from a minimum of 0.5 in/sec at 4 Hertz (Hz) to a maximum of 2 in/sec at 40 Hz. Below these thresholds, there is virtually no risk of building damage.

Equipment required for the construction of the towers and substations typically generates vibration velocities of approximately 0.089 in/sec, or less, at 25 feet. Assuming that blasting of boulders may be required for the placement of tower footings, the resultant peak particle velocity at the edge of the transmission line right-of-way would not be anticipated to exceed 0.5 in/sec. Because construction of the transmission line and substation would not require the use of equipment or activities that would generate groundborne vibration of sufficient velocity or duration that would cause damage to nearby existing structures, construction-generated ground-borne vibration would be considered to have a minor impact.

Transmission Line Noise Impacts

The Falcon to Gonder 345 kV transmission line would be designed to comply with the National Electrical Safety Code. Therefore, the project should not create significant or unusual impacts in area of audible noise. However, during corona activity transmission lines can generate a small amount of sound energy. This audible noise can increase during foul weather conditions. Water drops may collect on the surface of the conductors and increase corona activity so that a crackling or humming sound may be heard near a transmission line.

Transmission line audible noise is measured in decibels using a special weighting scale, the "A" scale that responds to different sound characteristics in a manner similar to the response of the human ear. Corona-induced noise tends to be broadband and can sometimes have a pure tone as well (usually at 120 Hz). Audible noise levels on well-designed 345 kV lines are usually not noticeable. For example, a typical calculated rainy weather audible noise for a 345 kV transmission line at the right-of-way edge is about the same or less than ambient levels in a library or typical daytime residential environments, and much less than background noise for wind and rain.

Estimated audible noise levels due to corona were calculated by Enertech (2000) for each of three transmission line configurations using computer modeling (BPA 1977). Table 3.11-9 presents a summary of the calculated audible noise levels for both fair weather and rainy weather conditions. Figures 3.11-10 through 3.11-12 present graphs of the calculated audible noise for the proposed configurations.

TABLE 3.11-9: CALCULATED AUDIBLE NOISE LEVELS FOR THE PROPOSED 345 KV TRANSMISSION LINE (AT THE PROPOSED ROW EDGE)

Configuration #	Location	Calculated Audible Noise	
		Fair L50 (dBA)	Rain L50 (dBA)
#1 : Proposed 345 kV	Either ROW Edge	28.0	53.0
#2 : 345/66/25/120 kV	345 kV ROW Edge	28.0	53.0
	120 kV ROW Edge	20.7	45.7
#3 : 345/230 kV	345 kV ROW Edge	28.4	53.4
	230 kV ROW Edge	27.5	52.5

FIGURE 3.11-10: CALCULATED AUDIBLE NOISE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE ALONE

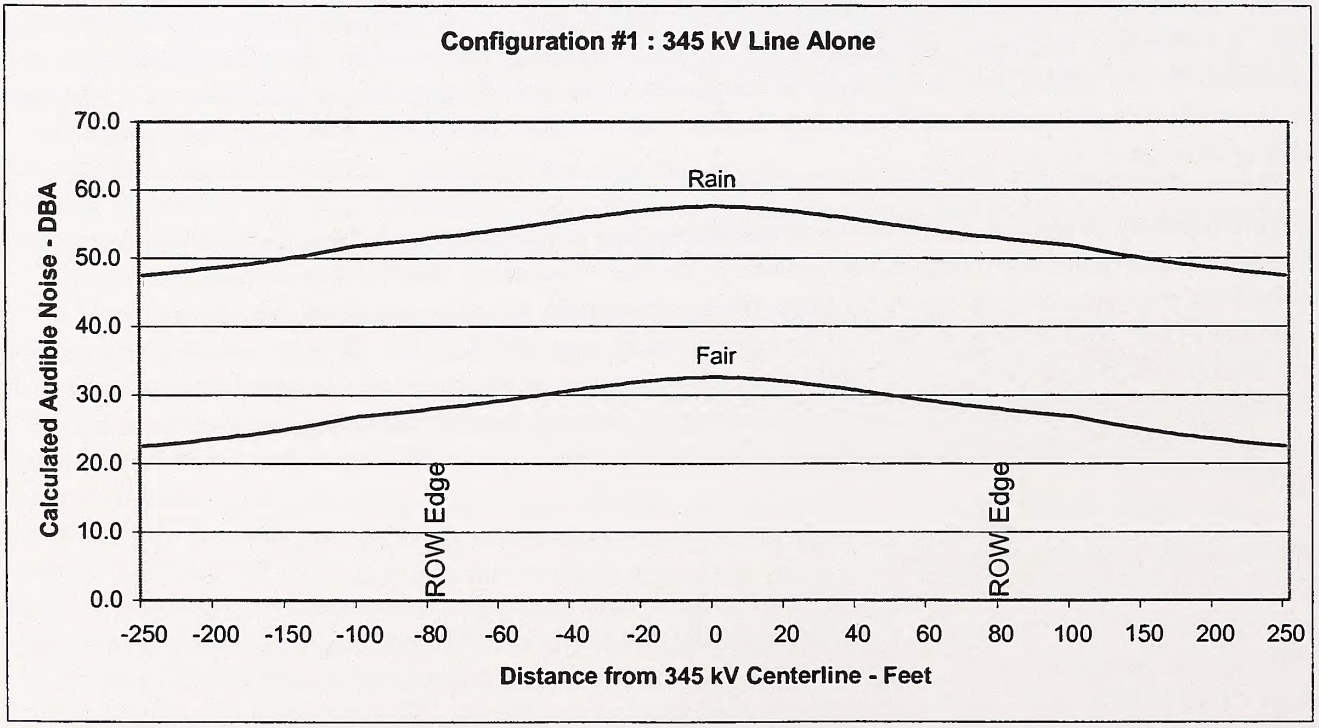


FIGURE 3.11-11: CALCULATED AUDIBLE NOISE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING 66/25 KV AND 120 KV TRANSMISSION LINES

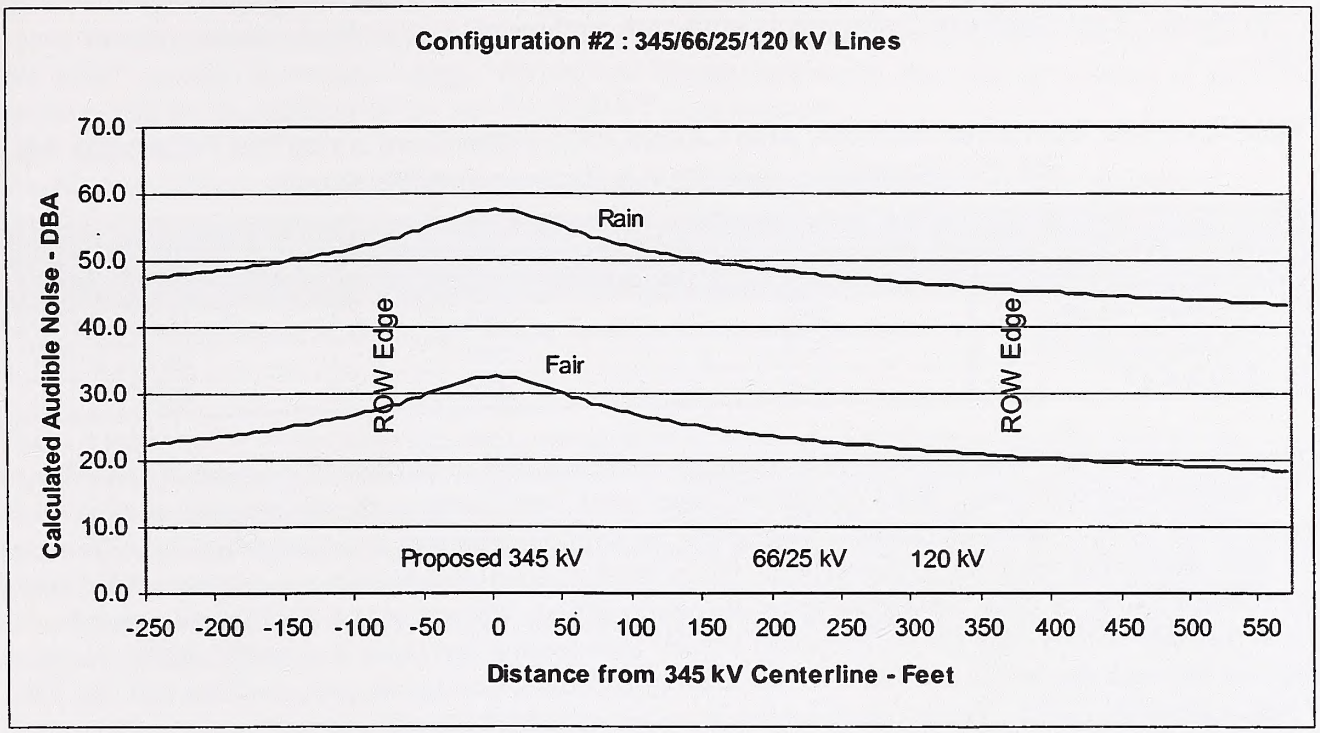
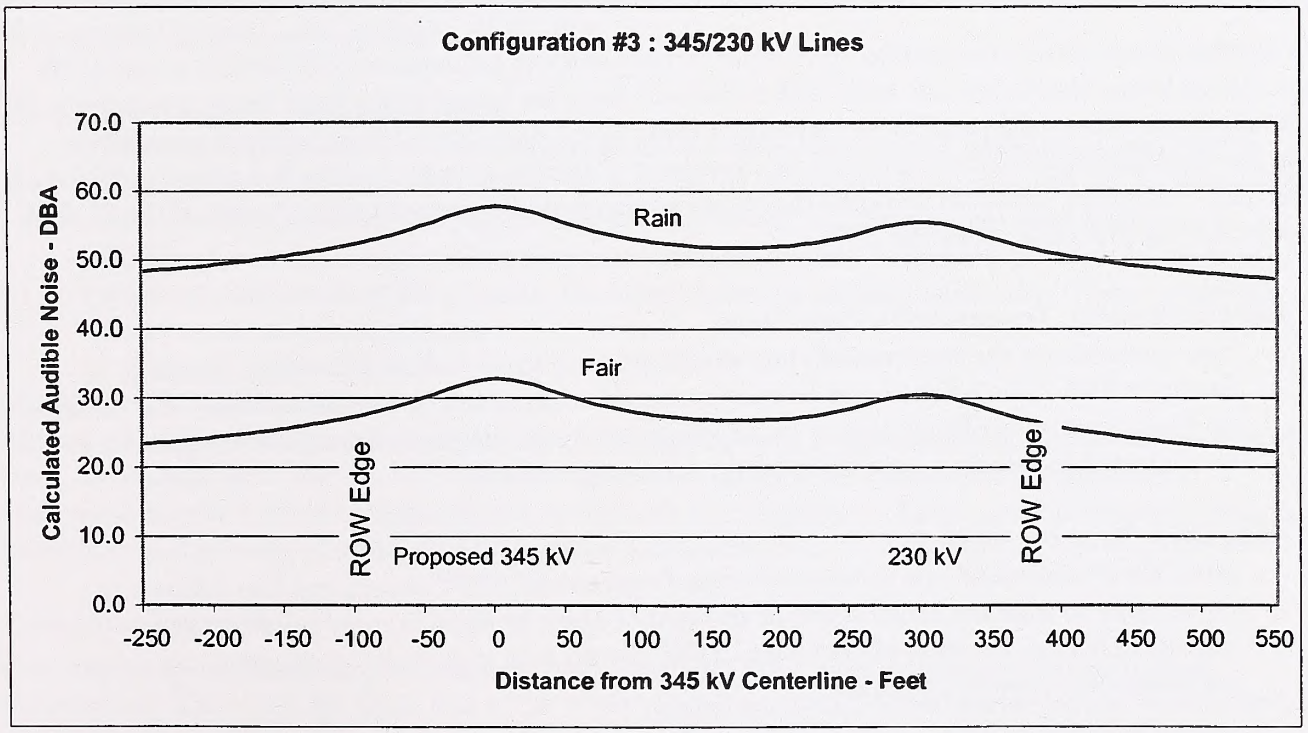


FIGURE 3.11-12: CALCULATED AUDIBLE NOISE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING A 230 KV TRANSMISSION LINE



The ambient measured fair weather noise levels were combined with the calculated 345 kV transmission line noise values at the proposed right-of-way edge to estimate a resulting ambient noise level (IEEE

1998: 15). Because noise values are logarithmic units, they are combined on an energy basis using a logarithmic formula of addition. Table 3.11-10 presents these analysis results. As shown, the calculated increase in audible noise at the right-of-way edge is about 2.6 to 7.4 dBA, depending upon the configuration. Wind conditions contributed significantly to the ambient fair weather measurement values.

TABLE 3.11-10: COMBINED AMBIENT AND CALCULATED NOISE LEVELS FOR THE PROPOSED 345 KV TRANSMISSION LINE (AT THE PROPOSED ROW EDGE)

Configuration #	Fair Weather L50 Audible Noise Sound Levels - dBA		
	Measured Ambient	Calculated 345 kV	Combined Estimate
#1 : Proposed 345 kV	29.0	28.0	31.6
#2 : 345/66/25/120 kV	21.5	28.0	28.9
#3 : 345/230 kV	24.0	28.4	29.7

Ambient measured fair weather noise levels ranged from about 21.5 to 29 dBA at the right-of-way edge of the transmission line route. Wind conditions contributed significantly to the ambient fair weather measurement values. Calculated audible noise levels for the transmission line ranged from about 28 to 28.4 dBA, depending upon the configuration. The estimated increase in audible noise at the right-of-way edge is about 2.6 to 7.4 dBA, depending upon the configuration. The calculated audible noise sound level at the right-of-way edge for the proposed 345 kV transmission line alone is about 31.6 dBA, for the proposed line with the 66/25 and 120 kV lines is about 28.9 dBA, and for the proposed line with the 230 kV line is about 29.7 dBA. These calculated levels are below the EPA outdoor activity noise guideline of 55 dBA (EPA 1974).

For wet weather conditions, calculated audible noise levels at the right-of-way edge were about 53 dBA. These calculated levels are still below the EPA outdoor activity noise guideline of 55 dBA and are similar to the range of audible noise levels measured in general rain conditions (41-63 dBA) (EPA 1974, IEEE 1974, Miller 1978).

The combined estimate of the ambient plus project noise levels is a maximum of 31.6 dBA at the ROW edge. Noise levels would decrease with farther distance from the transmission line. Since the addition of the transmission line could result in an increase of more that 3 dBA over current outdoor noise levels along the proposed right-of-way, it would be considered a significant impact under the criteria established in this EIS. However, it should be noted that noise levels would be generally within range of the 55 dBA outdoor activity guideline set by the EPA.

❑ ***Impact Noise-2: Transmission Line Noise***

The operation of the transmission line would generate some audible humming, crackling, or hissing noises. The noise would be most noticeable during wet or humid weather. This would be considered a significant impact on people living or working near the right-of-way, but it could be mitigated to less than significant by the following measure.

❑ ***Mitigation Measure Noise-2***

After the transmission line is constructed and operational, SPPC would conduct follow-up monitoring to measure actual outdoor and indoor noise levels in homes/buildings on or immediately near the right-of-way edge. SPPC would then implement appropriate mitigation measures on a case-by-case basis.

Substation Noise Impacts

Because of its remote location, the Falcon substation improvements would not create a significant noise impact. Although the Gonder substation does have a few local residences in the vicinity, they are far

enough away that they would not experience a notable increase in noise from the proposed substation expansion and improvements. The substation would be upgraded to 345 kV. New 230 kV buswork would be required to connect to the existing 230 kV ring bus. New equipment includes two 230 kV power circuit breakers, two 345/230 kV- 300 MVA transformers, two 345 kV power circuit breakers, and two 345kV reactors to control voltage. Around the Gonder substation, the main new source of audible noises would be the addition of the two 345/230 kV transformers.

Transformer noise is caused by vibration of its core (called magnetostriction), and this excitation produces pure tone components of transformer noise at the harmonics of the 60 Hz power-frequency, such as 120 Hz, 180 Hz, 360 Hz, etc. (EPRI 1979:3). To characterize audible noise levels near this classification of transformer, lateral profile measurements were conducted around an existing energized 345/125 kV transformer in Reno, Nevada at the Mira Loma substation on July 17, 2000 from 11:00 a.m. to 1:30 p.m.

These lateral profile characterization measurements were conducted on three accessible sides of an energized transformer (at 280 MVA with fans on) to characterize sound level attenuation as a function of distance away from the transformer. Table 3.11-11 presents a tabular summary of the lateral profile measurement data. Ambient audible noise measurements were also performed at each corner of the Mira Loma Substation prior to and after the lateral profile measurements. The manufacturer's guaranteed sound rating for this type of 345/230 kV transformer is 77 dB (energized) to 80 dB (fans on and energized at 300 MVA).

As shown in the previous Figure 2-7 in Chapter 2, the proposed location of the two new 345/230 kV transformers would be centrally located within the substation expansion (near the present existing northern fence line). Measured audible noise levels from the Mira Loma substation transformer show that the levels decrease from about 75 dBA near the transformer down to about 51 dBA at 200 to 300 feet away. Since the sound level of a transformer should decrease as the inverse square of the distance from the transformer, estimated sound levels should be further reduced to levels which currently exist at the existing northern property line (about 40 to 50 dBA). These calculated levels should also be below the EPA outdoor activity noise guideline of 55 dBA.

- ***Impact Noise-3: Substation Noise***

  Electrical equipment at the substations would generate noise during operation of the project. Transformers and generators at the two substations would produce noise and add to the ambient noise levels. However, the Falcon substation is located in a remote area away from any buildings, and the Gonder substation improvements would not create a noticable increase in ambient noise levels at the property boundary closest to existing residences. Thus, substation noise would not be significant.

Maintenance Noise Impacts

As part of routine maintenance over the life of the project, once a year two SPPC inspectors would drive along the transmission line on ATVs to conduct a visual inspection. Occasionally, vehicles and equipment may be needed to make repairs or respond to emergencies. These activities would create only short-term and infrequent noise, which would be a minor impact.

Computer Interference

Personal computer monitors using cathode ray tubes (CRTs) can be susceptible to magnetic field interference. The magnetic fields that occur in the normal operation of the electric power system can be of sufficient intensity to affect computer monitors under certain conditions. Magnetic field interference results in disturbances to the image displayed on the CRT monitor, often described as screen distortion, "jitter," or other visual defects (Banfi 2000). In most cases it can be annoying, and at its worst, it can

prevent use of the monitor. The extent of interference depends on 60 Hz magnetic field intensity, monitor orientation, monitor design, and the monitor's vertical refresh rate.

TABLE 3.11-11: SUMMARY OF 345/125 KV TRANSFORMER NOISE MEASUREMENTS AT MIRA LOMA SUBSTATION (IN DB)

Initial Ambient Measurements :

	A	C	63	125	250	1K	4K	8K
Location #1	40.0	68.5	57.5	48.5	40.0	31.0	20.0	13.0
Location #2	41.5	59.0	55.0	52.0	42.5	31.5	22.5	13.0
Location #3	48.5	60.5	59.0	52.0	49.5	39.5	27.5	18.5
Location #4	50.5	63.0	60.5	58.5	52.5	46.0	29.5	20.0

Profile Measurements - Side "A" :

	A	C	63	125	250	1K	4K	8K
10 Foot	74.0	78.0	70.0	71.0	70.5	69.5	58.0	51.5
50 Foot	65.5	72.0	67.0	64.0	60.5	60.5	48.0	40.5
100 Foot	59.5	65.5	60.5	62.0	56.0	55.0	42.0	33.5
150 Foot	56.5	63.5	57.5	58.0	53.5	53.5	39.0	28.5
200 Foot	53.5	63.5	56.0	56.5	50.0	50.0	37.5	25.5
250 Foot	52.0	60.0	56.0	56.0	49.0	48.5	34.0	22.5

Profile Measurements - Side "B" :

	A	C	63	125	250	1K	4K	8K
10 Foot	72.5	78.0	74.5	71.0	71.0	68.0	56.5	47.5
50 Foot	61.0	71.0	70.0	66.0	59.5	55.5	45.5	39.5
100 Foot	55.5	68.0	63.0	63.0	55.5	50.5	41.0	34.0
150 Foot (Bus)	53.0	66.0	63.0	61.5	51.5	47.5	38.5	34.0
200 Foot	52.0	65.5	62.0	58.0	51.0	45.5	35.0	31.0
250 Foot	49.5	63.0	60.0	56.5	49.0	43.0	35.0	25.5
300 Foot	46.5	61.0	56.5	55.0	49.0	40.0	31.0	22.0

Profile Measurements - Side "C" :

	A	C	63	125	250	1K	4K	8K
10 Foot	78.5	84.5	79.5	79.5	78.5	73.0	62.0	56.0
50 Foot	64.0	73.0	72.5	65.0	62.5	59.5	47.5	42.0
100 Foot	58.5	70.0	68.5	65.0	58.0	54.0	41.5	35.5
150 Foot (Bus)	55.5	67.0	61.5	62.5	56.0	51.5	39.5	30.5
200 Foot	53.5	67.5	61.5	60.5	58.5	49.0	36.5	26.0

Concluding Ambient Measurements :

	A	C	63	125	250	1K	4K	8K
Location #1	40.5	58.0	53.5	52.5	41.5	31.0	17.5	13.0
Location #2	45.0	59.5	56.5	54.0	49.5	34.5	21.5	14.0
Location #3	53.5	67.5	61.5	61.5	54.5	45.5	35.0	21.0
Location #4	52.5	64.0	61.5	60.5	54.0	47.0	33.0	22.5

Computer monitors that use cathode ray tubes, or CRTs, could experience image jitter lines in proximity to the proposed 345 kV transmission line (within approximately 60 feet of the right-of-way edge for normal loading and within approximately 110 feet of the right-of-way for maximum loading conditions). This image distortion does not occur on liquid crystal display (LCD) monitors common on most portable computers (ESAA 1996). Computer monitor interference is a recognized problem in the video monitor

industry. As a result, there are manufacturers who specialize in monitor interference solutions and shielding enclosures. Possible solutions to this problem include relocation of the monitor, use of magnetic shield enclosures, software programs to adjust the monitor's vertical refresh rate, and replacement of cathode ray tube monitors with liquid crystal displays.

- ***Impact Noise-4: Computer Monitor Interference***

  Computer monitors that use cathode ray tubes, or CRTs, could experience image jitter lines in proximity to the proposed 345 kV transmission line (within approximately 60 feet of the right-of-way edge for normal loading and within approximately 110 feet of the right-of-way for maximum loading conditions). This image distortion does not occur on LCD monitors common on most portable computers (ESAA 1996). Although this is not a significant environmental or noise impact, it can be annoying; at its worst, it can prevent use of the monitor.

- ***Mitigation Measure Noise-4***

  After the transmission line is constructed and operational, if computer monitor interference is reported by people within 110 feet of the right-of-way, SPPC would implement appropriate mitigation measures on a case-by-case basis. Possible solutions include relocation of the monitor, use of magnetic shield enclosures, software programs to adjust the monitor's vertical refresh rate, and replacement of cathode ray tube monitors with liquid crystal displays.

Radio and TV Interference

Overhead transmission lines do not, as a general rule, interfere with radio or TV reception. There are two potential sources for interference: corona and gap discharges. As described earlier, corona discharges can sometimes generate unwanted radio frequency electrical noise. Corona-generated radio frequency noise decreases with distance from a transmission line and also decreases with higher frequencies (when it is a problem, it is usually for AM radio and not the higher frequencies associated with TV signals). Gap discharges are different from corona. Gap discharges can develop on transmission lines at any voltage and are more frequently found on smaller distribution lines. They can take place at tiny electrical separations (gaps) that can develop between mechanically connected metal parts. A small electric spark discharges across the gap and can create unwanted electrical noise. The severity of gap discharge interference depends on the strength and quality of the transmitted radio or TV signal, the quality of the radio or TV set and antenna system, and the distance between the receiver and transmission line.

Shortwave (high frequency or HF) radio bands utilize amplitude modulation (AM) transmissions that are susceptible to broadband pulse-type noise such as transmission line corona and gap discharge. There are many factors that govern how significant shortwave radio interference can be, including transmission line configuration, distance away from the transmission line, antenna design, receiver performance, signal strength, and weather conditions. An electric utility would typically address shortwave radio interference problems on an individual case-by-case basis, since many different parameters influence reception along different portions of the transmission line route. For example, if a broken piece of hardware on a tower were the source of interference, it would be located and repaired.

Field calculations were performed using a computer program originally developed by BPA (BPA 1977). Calculated radio and TV interference levels in fair weather and in rain at the edge of the right-of-way for the proposed 345 kV transmission line are typical for lines of this voltage class. There has been a significant amount of work done to quantify radio and TV noise and provide design methods to mitigate this phenomenon during design (e.g., EPRI 1982, IEEE 1971, 1972, 1976). The potential for interference would depend, among other things, on the signal strength, receiver design, antenna, and transmission line noise level in the signal bandwidth.

A signal-to-noise ratio (SNR) can be calculated and reception can be evaluated using the reception guidelines of the Federal Communications Commission (FCC). In general, the 345 kV transmission line

should not cause radio and TV interference in fair weather due to corona noise. In wet weather, it is possible that AM radio reception for weak signals can be adversely affected by corona-induced noise on the right-of-way. The extent of interference cannot be evaluated without knowledge of local signal strengths to facilitate calculation of anticipated SNRs.

Figures 3.11-13 through 3.11-15 present the calculated radio noise levels for each of the three transmission line configurations (the proposed 345 kV line alone, the proposed 345 kV line paralleling an existing 66/25 kV and 120 kV lines, and the proposed 345 kV line paralleling an existing 230 kV line). Figures 3.11-16 through 3.11-18 present the calculated TV noise interference levels for each configuration. The calculated levels indicate a potential for some level of radio frequency interference, especially during wet weather conditions when calculated levels approach 81 dB at transmission line center and about 63 dB at the right-of-way edge (calculated fair weather levels approach 64 dB at centerline and about 46 dB at the right-of-way edge). Calculated TV interference noise levels were lower (38 dBuV/m at centerline and 28 dBuV/m at the right-of-way edge during wet weather conditions). Calculations were performed for an altitude of 6,250 feet with a radio interference antenna height of 6.6 feet and a TV antenna height of 9.8 feet under fair and rain conditions. The reference frequency for the calculations is 1 MHz for radio noise and 75 MHz for TV noise. Results are presented in dB above a reference level of 1 uV/m.

There are three potential mechanisms for radio and TV interference sources on transmission lines: (1) corona, (2) gap discharge, and (3) signal re-radiation. The potential for interference from these three mechanisms depends on many factors, including broadcast frequency, signal strength, broadcast reception path, receiver design, types and locations of antenna and related equipment, seasonal weather conditions, the sunspot cycle, and transmission line configuration and design details.

FIGURE 3.11-13: CALCULATED RADIO NOISE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE ALONE

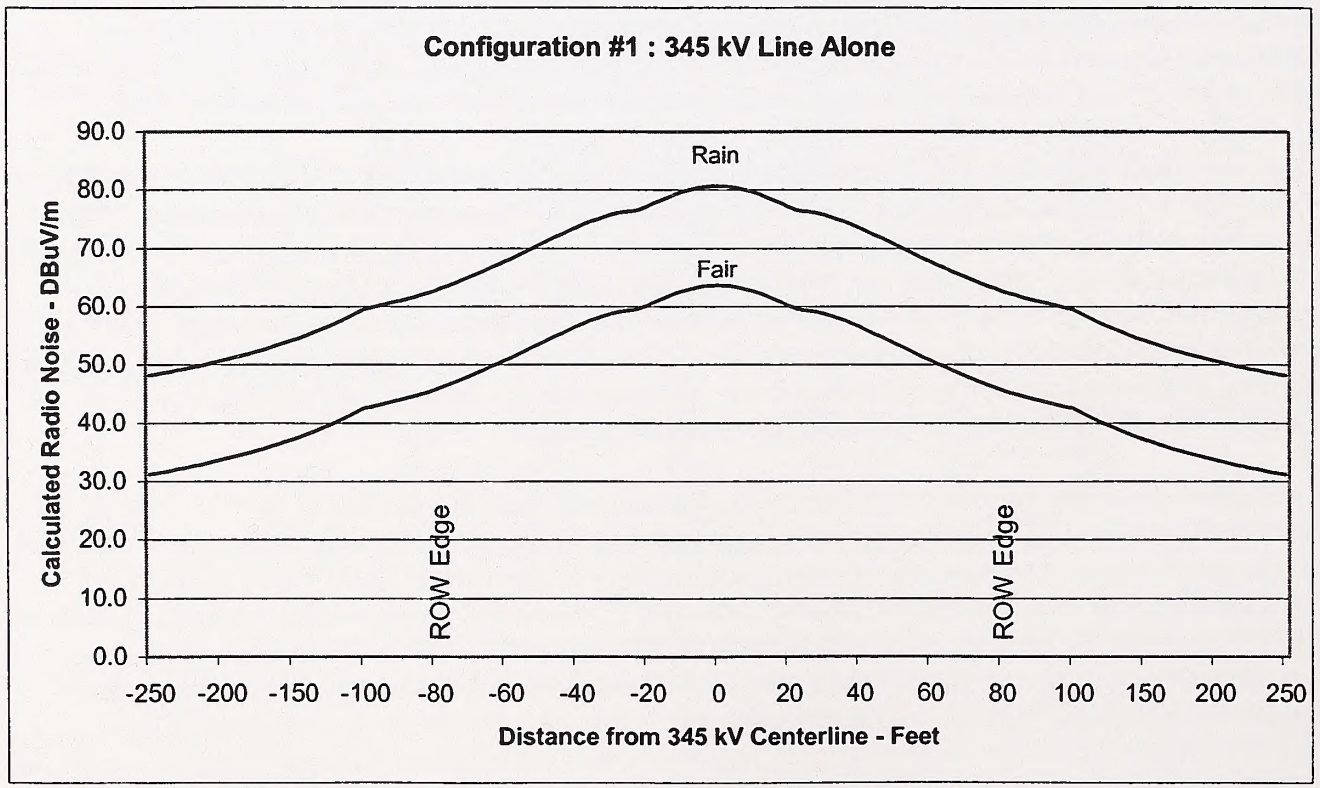


FIGURE 3.11-14: CALCULATED RADIO NOISE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING 66/25 KV AND 120 KV TRANSMISSION LINES

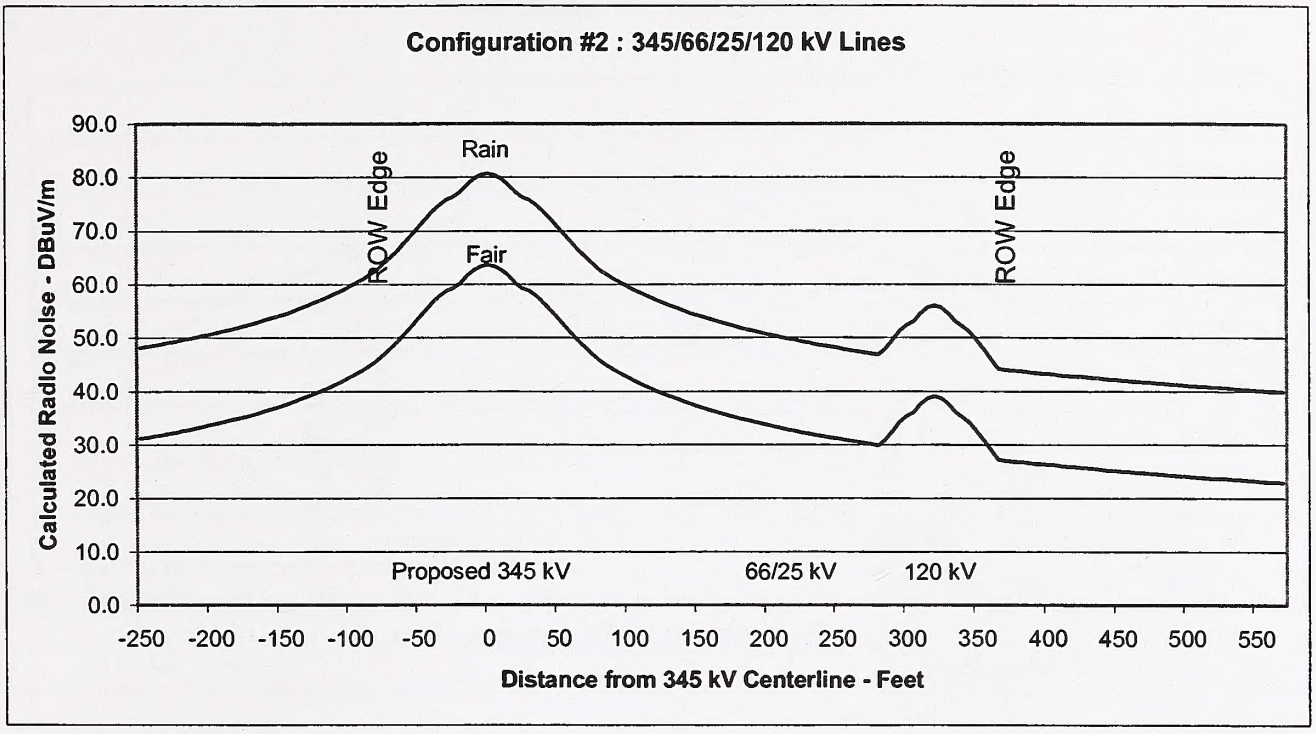


FIGURE 3.11-15: CALCULATED RADIO NOISE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING A 230 KV TRANSMISSION LINE

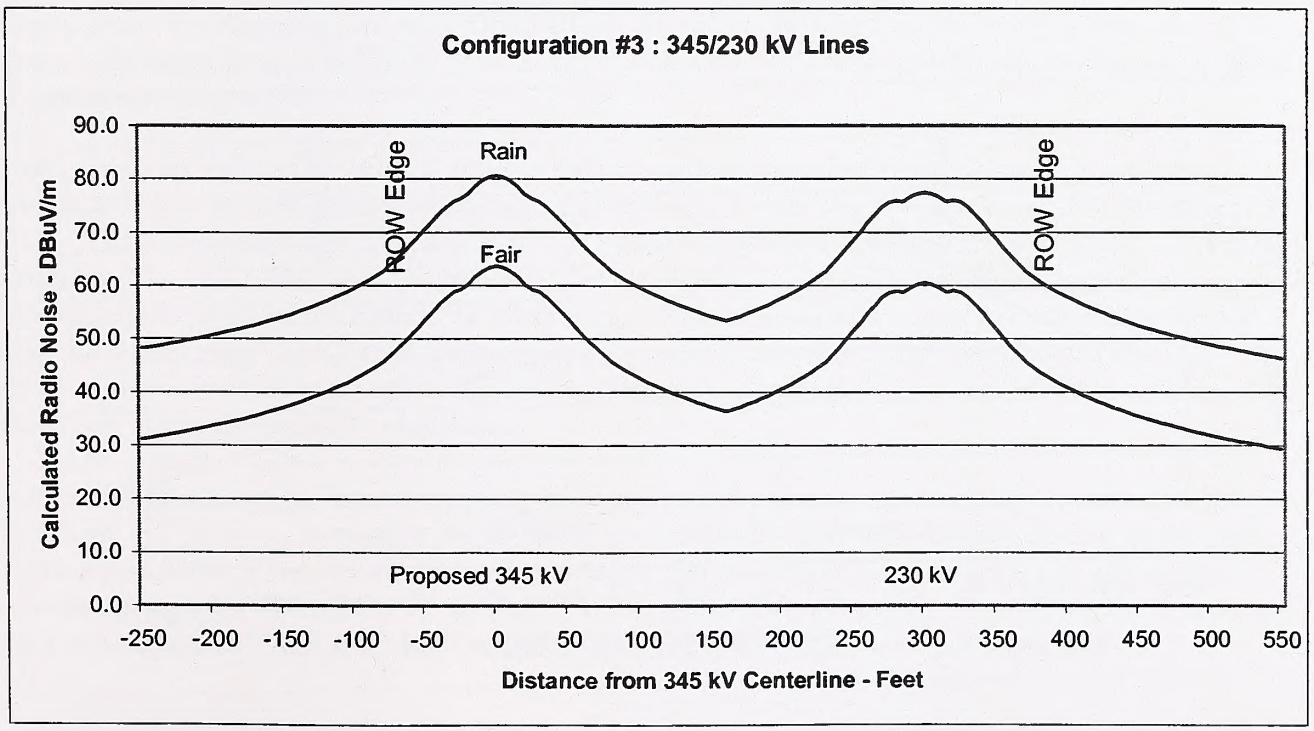


FIGURE 3.11-16: CALCULATED TV INTERFERENCE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE ALONE

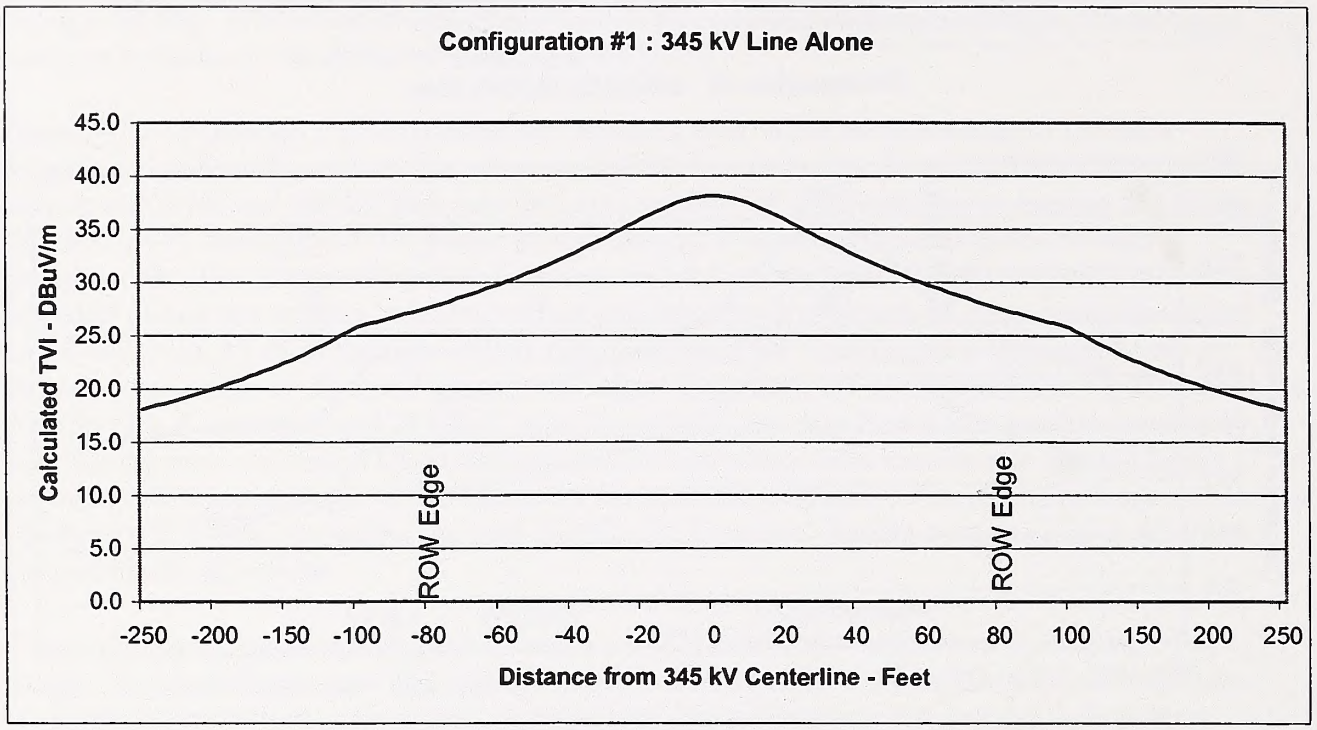


FIGURE 3.11-17: CALCULATED TV INTERFERENCE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING 66/25 KV AND 120 KV TRANSMISSION LINES

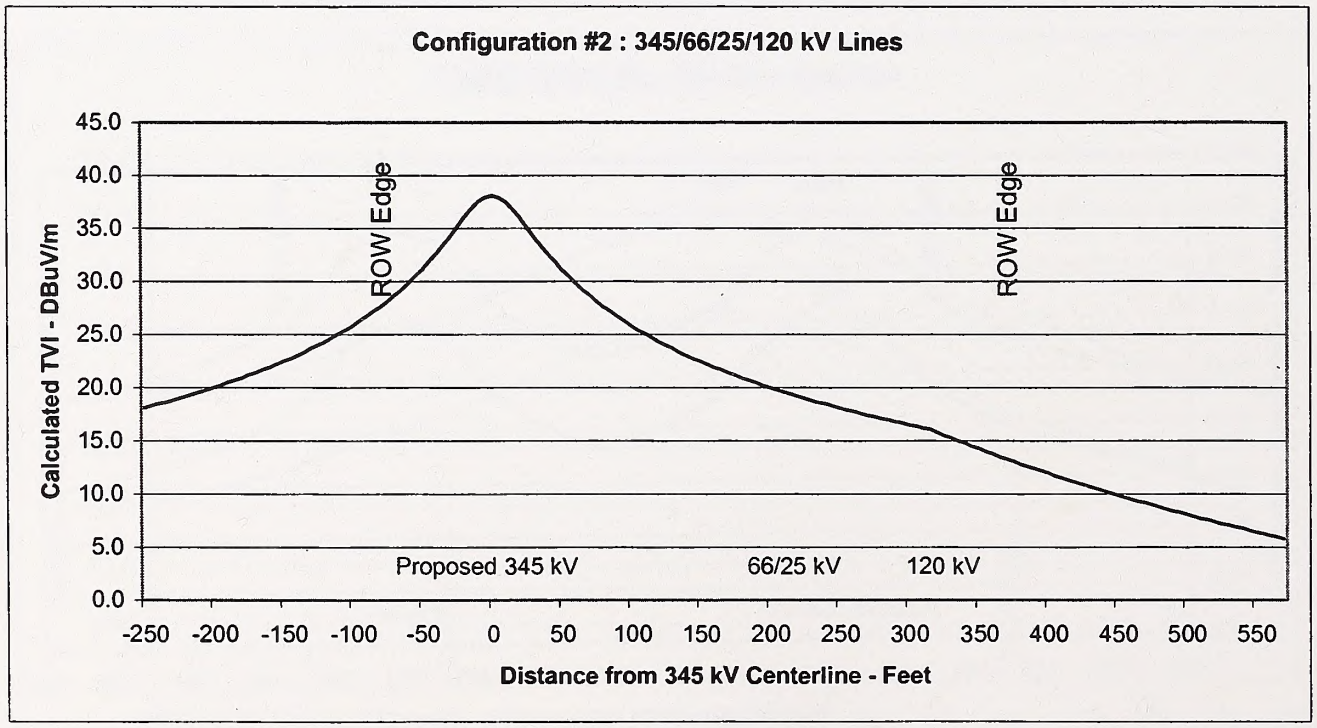
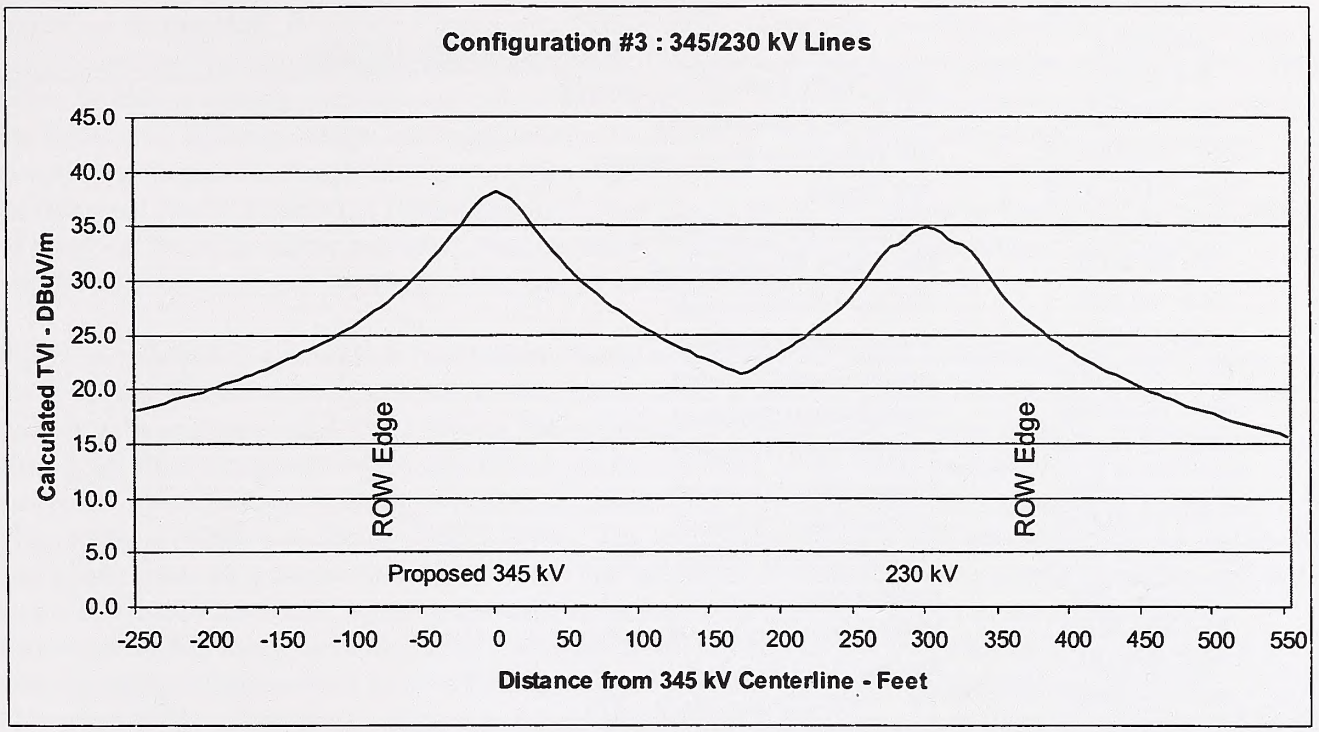


FIGURE 3.11-18: CALCULATED TV INTERFERENCE PROFILE FOR THE PROPOSED 345 KV TRANSMISSION LINE PARALLELING A 230 KV TRANSMISSION LINE



Frequency band uses/allocations in the United States are regulated by the FCC using standards adopted by the International Telecommunication Union (ITU), an agency of the United Nations. The ITU has designated three administrative regions for the world, with the United States located within Region #2. Within each region, frequency bands are allocated for different uses. Table 3.11-12 presents a summary of the frequency range allocations for the United States (Region #2) with their associated usage designations. For example, AM radios frequencies fall within the range of 535 to 1605 kHz, while TV stations can range from 54 MHz (channel 2) up through 806 MHz (channel 69) but not through a range of contiguous frequencies.

Corona-induced radio noise and TV noise is frequency-dependent and decreases with frequency, extending from a peak in the low-medium frequency band to very low levels at about 10 - 20 MHz (EPRI 1982). These frequencies are typically well below public frequencies such as CB radio (26.9 – 27.4 MHz), FM radio (88 – 108 MHz), and TV broadcast (54 – 806 MHZ), and far below higher satellite transmission frequencies (such as satellite cable TV). However, corona-induced radio noise can fall within the AM radio frequency range (535 – 1605 kHz) and some amateur band shortwave radio frequencies (1.8 - 30 MHz). Corona-induced radio noise and TV interference is significantly increased in wet weather conditions above dry weather conditions.

Gap discharge noise is the most commonly noticed form of transmission line radio interference. Gap discharges can occur on broken or poorly fitting line hardware, such as insulators, clamps, or brackets. Unlike corona, which is more intense in wet weather, gap discharges often disappear in wet weather because the gaps are shorted out by moisture. Hardware is designed to be problem-free, but corrosion, wind motion, gunshot damage, and insufficient maintenance contribute to gap formation.

TABLE 3.11-12: FREQUENCY ALLOCATION TABLE FOR ITU – REGION #2

FREQUENCY RANGE	USAGE DESIGNATION
0 - 30 kHz	**VLF (Very Low Frequency)**
30 - 300 kHz	**LF (Low Frequency)**
300 - 3000 kHz	**MF (Medium Frequency)**
535 - 1605 kHz	AM Radio
1800 - 2000 kHz	*Amateur Band (160-meter)*
3 - 30 MHz	**HF (High Frequency)**
3.5 - 4.0 MHz	*Amateur Band (80-meter)*
7.0 - 7.3 MHz	*Amateur Band (40-meter)*
10.1 - 10.15 MHz	*Amateur Band (30-meter)*
14.0 - 14.35 MHz	*Amateur Band (20-meter)*
18.068 - 18.168 MHz	*Amateur Band (17-meter)*
21.0 - 21.45 MHz	*Amateur Band (15-meter)*
24.89 - 24.99 MHz	*Amateur Band (12-meter)*
26.9 - 27.4 MHz	Citizens Band Radio (CB)
28.0 - 29.7 MHz	*Amateur Band (10-meter)*
30 - 300 MHz	**VHF (Very High Frequency)**
50 - 54 MHz	*Amateur Band (6-meter)*
54 - 72 MHz	TV - VHF (Channels 2 - 4)
76 - 88 MHz	TV - VHF (Channels 5 - 6)
88 - 108 MHz	FM Radio
108 - 150 MHz	Aeronautical Navigation, Communications, Satellite, Government
144 - 148 MHz	*Amateur Band (2-meter)*
150 - 162 MHz	Emergency, Forestry, Police, Maritime, Taxi, etc.
174 - 216 MHz	TV - VHF (Channels 7 - 13)
222 - 225 MHz	*Amateur Band (1.25-meter)*
300 - 3000 MHz	**UHF (Ultra High Frequency)**
420 - 450 MHz	*Amateur Band (70-cm)*
450 - 460 MHz	Transportation, Mobile Telephone, Taxi, etc.
460 - 470 MHz	Airport, Police, Fire, Medical
470 - 806 MHz	TV - UHF (Channels 14 - 69)
806 - 896 MHz	Cellular Telephone, Aircraft Telephone
896 - 1300 MHz	Personal Communications Services, Aeronautical, Radiological, etc.
902 - 928 MHz	*Amateur Band (33-cm)*
1240 - 1300 MHz	*Amateur Band (23-cm)*
2300 - 2450 MHz	*Amateur Band (13-cm)*
3 - 30 GHz	**SHF (Super High Frequency)**
30 - 300 GHZ	**EHF (Extremely High Frequency)**

Unlike corona, gap discharge noise is characterized by relatively long periods between successive pulses of electromagnetic energy. The RF noise from gap discharges tends to be broadband due to the constantly changing impedance characteristics of the gap. Spark discharge noise extends over a larger frequency spectrum than corona; RF noise from these sparks tends to dominate those from corona, especially at frequencies above 10 – 20 MHz and can extend beyond 1,000 MHz.

Often the source of gap noise is not due to transmission lines. The large majority of interference complaints are found to be attributable to sources other than transmission lines: poor signal quality, poor antenna, door bells, and appliances such as heating pads, sewing machines, freezers, ignition systems, aquarium thermostats, fluorescent lights, etc. (IEEE 1976). Generally, interference due to gap discharges is less common on high-voltage transmission lines. The reasons that high voltage transmission lines have fewer problems include predominate use of steel structures, fewer structures, greater mechanical load on hardware, and different design and maintenance standards. (Lower voltage distribution lines tend to generate more gap discharge interference than higher voltage transmission lines.) Gap discharge interference can be avoided or minimized by proper design of the transmission line hardware parts, use of electrical bonding where necessary, and by careful tightening of fastenings during construction. Individual sources of gap discharge noise can be readily located and corrected.

Signal re-radiation is a condition sometimes created by a broadcast signal interaction with power line components. As electromagnetic waves travel away from a radio frequency broadcast antenna they may encounter man-made conductive objects like buildings or transmission lines on metallic structures. Broadcast electromagnetic waves can induce electric currents of the same frequency in a conductive structure. These induced currents would then radiate their own secondary electromagnetic waves in a phenomenon called re-radiation (IEEE 1996). The re-radiated waves would generally differ in amplitude and phase from the primary broadcast wave. The secondary re-radiated waves would combine with and alter the primary broadcast signal, potentially reducing its usefulness. Some reports indicate that transmission line signal re-radiation of AM radio broadcast signals can combine with the AM signal, causing signal enhancements up to +2 dB and signal attenuations as low as approximately –8 dB (Trueman 1981). A receiver designed to detect and process a radio frequency signal would respond to all of the electromagnetic energy in its design bandwidth, irrespective of source. This means that re-radiated waves could, depending upon receiver/antenna design and signal strength, degrade a receiver's performance and, if sufficiently strong, can result in unacceptable performance.

Depending on broadcast signal characteristics and transmission line design parameters, transmission lines may have radio frequency currents induced in the loop created by the overhead shieldwire-tower-earth path. The phase conductors are not a significant component of the re-radiation phenomenon. The dimensions of the shieldwire-tower-earth return loops could approach a significant fraction of the signal wavelength (e.g., ¼ λ) and create re-radiation interference. However, many factors can affect the magnitude of these induced currents and the associated re-radiated electromagnetic waves: transmission line configuration parameters, RF broadcast source frequency, and orientation of the transmission line. Re-radiation interference is usually noticed near the AM radio frequency ranges, especially when the broadcast antenna is located close to the transmission line.

Shortwave (high frequency or HF) radio bands utilize amplitude modulation (AM) transmissions that are susceptible to broadband pulse-type noise such as transmission line corona and gap discharge. There are many factors which govern how significant shortwave radio interference can be, including transmission line configuration, distance away from the transmission line, antenna design, receiver performance, signal strength, and weather conditions. An electric utility would typically address shortwave radio interference problems on an individual case-by-case basis, since many different parameters can influence reception along different portions of the power line route. For example, if a broken piece of hardware on a tower were the source of interference, it would be located and repaired.

- ***Impact Noise-5: Radio and TV Interference***

  In general, the 345 kV transmission line should not cause radio and TV interference in fair weather due to corona noise. However, in wet weather, it is possible that AM radio reception for weak signals can be adversely affected by corona-induced noise on the right-of-way. Although this is not a significant environmental or noise impact, it could be annoying.

- ***Mitigation Measure Noise-5***

  After the transmission line is constructed and operational, if shortwave radio interference is reported by people immediately along the right-of-way, SPPC would implement appropriate mitigation measures on a case-by-case basis. For example, if a broken piece of hardware on a tower were the source of interference, it could be located and repaired.

Alternative-Specific Impacts

Construction activities would result in temporary noise impacts for sensitive receptors (i.e., buildings or residences) within approximately 2,000 feet of the construction areas. Most residences and other buildings are located near Segment B, which is part of the Crescent Valley (a) and (b) route alternatives, and Segment J, which is common to all route alternatives. However, there are some other residences and buildings scattered throughout the study area (i.e., all routes) that could be affected (see Appendix D). Noise would be generated by blasting, construction equipment, and also vehicle trips associated with construction activities. This would be considered a significant, but short-term noise impact. Mitigation measures are provided to reduce the impact to a less-than-significant level. If blasting activities occur during the more noise-sensitive periods of the day (e.g., evening and nighttime hours), resultant noise levels would likely result in increased annoyance and potential sleep disruption to occupants of the nearby residences located within approximately 3,000 feet of the site. Mitigation measures are provided to reduce the impact to a less-than-significant level.

The land use field survey conducted for this project by Stantec (2000) indicates that Segment B (Crescent Valley routes only) has approximately 10 existing residential units and Segment J (all routes) has approximately 11 residential units within 200 feet of the proposed centerline that could experience noise from the transmission lines (i.e., humming or crackling noises in wet or humid weather). Impacts to these residents could be mitigated to a less-than-significant level with Mitigation Measure Noise-3.

There are approximately 6 existing buildings along Segment B (Crescent Valley routes only) and 3 existing residences along Segment J (all routes) that could potentially be impacted by computer monitor interference. While this would not be considered a significant impact, it could be resolved by Mitigation Measure Noise-4.

In wet weather, it is possible that AM radio reception for weak signals could be adversely affected by corona-induced noise on the right-of-way. At the time of the field survey, Segment B had one existing residential unit (a trailer) within the right-of-way, and Segment J had 3 residences close enough to the right-of-way edge that they could experience AM radio reception interference. Although this is not a significant impact, it could be resolved by Mitigation Measure Noise-5.

Gap discharge noise is the most commonly noticed form of transmission line radio interference. Gap discharges can occur on broken or poorly fitting line hardware, such as insulators, clamps, or brackets. Unlike corona, which is more intense in wet weather, gap discharges often disappear in wet weather because the gaps are shorted out by moisture. Hardware is designed to be problem-free, but corrosion, wind motion, gunshot damage, and insufficient maintenance contribute to gap formation.

Summary Comparison of Route Alternatives

TABLE 3.11-13: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Noise-1: Short-term Construction Noise	X	X	X	X	X
Impact Noise-2: Transmission Line Noise	X	X	X	X	X
Impact Noise-3: Substation Noise	X	X	X	X	X
Impact Noise-4: Computer Monitor Interference	X	X	X	X	X
Impact Noise-5: Radio and TV Interference	X	X	X	X	X

RESIDUAL IMPACTS

Construction noise impacts would be considered minor after mitigation, as would impacts to computer monitors, AM radio reception, and operational noise impacts. However, people traveling along or under the transmission line (or who subsequently move near the right-of-way) could experience corona noise during wet or humid weather.

NO ACTION ALTERNATIVE

Under the No Action Alternative, noise-related impacts associated with this project would not occur. However, noise-related impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

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3.12 AIR QUALITY

3.12.1 AREA OF ANALYSIS AND METHODOLOGY

The analysis area for air quality resources is divided into two parts. Construction impacts for on-site and off-site emissions are assessed for the ROW and all access roads at a local level. This also includes an analysis of any potential air quality impacts to close sensitive receptors just outside the ROW. Long-term air quality impacts are assessed at a regional level. These impacts would result from operation of the project and result in a potential impact at the regional level and contribute to measured concentrations of criteria pollutants. All impacts are assessed in relation to federal thresholds applicable to this area.

REGULATORY FRAMEWORK

Nevada's air quality is regulated by several jurisdictions including the U.S. Environmental Protection Agency (EPA), and the state agency referred to as the Bureau of Air Quality (BAQ). Each of these jurisdictions develop rules, regulations, policies, and/or goals to attain the goals or directives imposed upon them through legislation. Although EPA regulations may not be superseded, the state regulations may be more stringent.

Pollutants subject to federal ambient standards are referred to as "criteria" pollutants because the EPA publishes criteria documents to justify the choice of standards. One of the most important reasons for air quality standards is the protection of those members of the population who are most sensitive to the adverse health effects of air pollution, termed "sensitive receptors." The term sensitive receptors refers to specific population groups, as well as the land uses where they would reside for long periods. Commonly identified sensitive population groups are children, the elderly, the acutely ill, and the chronically ill. Commonly identified sensitive land uses are residences, schools, playgrounds, childcare centers, retirement homes or convalescent homes, hospitals, and clinics. The federal and state standards for the criteria pollutants and other state-regulated air pollutants are shown in Table 3.12-1.

Federal Air Quality Regulations

The federal 1970 Clean Air Act authorized the establishment of national health-based air quality standards, and also set deadlines for their attainment. The federal Clean Air Act Amendments of 1990 (1990 CAAA) made major changes in deadlines for attaining National Ambient Air Quality Standards (NAAQS) and in the actions required of areas of the nation that exceeded these standards. The 1990 CAAA require designated agencies in any area of the nation that does not meet the NAAQS to prepare a plan demonstrating the steps to bring the area into compliance. The 1990 CAAA completely revised the federal statute. They provide a new timeframe for achieving attainment of NAAQS and a new set of guidelines and planning processes for carrying out the requirements of the Amendments. Provisions of Section 182, which relates to O_3 nonattainment areas, and Section 187, which relates to CO nonattainment areas, emphasize strategies for reducing vehicle miles traveled. Section 182 requires submission of a plan revision that "identifies and adopts specific enforceable transportation control measures to offset any growth in emissions from growth in vehicle miles traveled or number of vehicle trips in such an area to meet statutory requirements for demonstrating periodic emission reduction requirements." The 1990 CAAA require that projects receiving federal funds demonstrate conformity to the approved State Implementation Plan (SIP)/local air quality attainment plan for the region.

The 1990 CAAA require federal agencies to ensure that their actions are consistent with the Clean Air Act and with federally enforceable air quality management plans (e.g., State Implementation Plans). The conformity assessment process is intended to ensure that federal agency actions: (1) will not cause or contribute to new violations of NAAQS; (2) will not increase the frequency or severity of any existing

violations of ambient air quality standards; and (3) will not delay the timely attainment of ambient air quality standards.

TABLE 3.12-1: AMBIENT AIR QUALITY STANDARDS

NEVADA[1]		NATIONAL[2]	
Air Pollutant	Concentration	Primary (>)	Secondary (>)
Ozone Ozone-Lake Tahoe Basin #90	0.12 ppm, 1-hr avg 0.10 ppm 1-hr avg	0.12 ppm, 1-hr avg -	0.12 ppm, 1-hr avg -
Carbon Monoxide less than 5,000 ft above Mean Sea Level	9 ppm, 8-hr avg	9 ppm, 8-hr avg	none
Carbon Monoxide at or greater than 5,000 ft Mean Sea Level	6.0 ppm 8-hr avg	9 ppm, 8-hr avg	none
Carbon Monoxide at any elevation	35 ppm 1-hr avg	35 ppm 1-hr avg	none
Nitrogen Dioxide	.05 ppm annual avg	0.053 ppm, annual avg	0.053 ppm, annual avg
Sulfur Dioxide	.03 ppm, annual avg 0.14 ppm, 24-hr avg 0. 5 ppm, 3-hr avg	0.03 ppm, annual avg 0.14 ppm, 24-hr avg	0.50 ppm, 3-hr avg
Suspended Particulate Matter (PM_{10})	50 μ g/m^3 annual arithmetic mean 150 μ g/m^3, 24-hr avg	50 μ g/m^3 annual arithmetic mean 150 μ g/m^3, 24-hr avg	50 μ g/m^3 annual arithmetic mean 150 μ g/m^3, 24-hr avg
Lead	1.5 μ g/m^3, calendar quarter	1.5 μ g/m^3, calendar quarter	1.5 μ g/m^3, calendar quarter
Hydrogen Sulfide	0.08 ppm, 1-hr avg	--	--

[1] These standards must not be exceeded in areas where the general public has access.

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

ppm = parts per million by volume

μ g/m^3 = micrograms per cubic meter

Source: Nevada Division of Environmental Protection, 1999.

Federal thresholds depend on whether or not an area is in attainment of NAAQS and, if not, then what designated level of non-attainment. The thresholds are more stringent for areas not in attainment and labeled severe or serious. The thresholds are a bit more generous for areas in attainment. The applicable emissions thresholds change whenever an area is redesignated. Two types of NAAQS have been established: (1) primary standards, which protect public health; and (2) secondary standards, which protect public welfare from non-health-related adverse effects such as visibility reduction.

State Air Quality Regulations

Both federal and state air quality regulations are implemented and enforced in Nevada by designated air quality management districts. Most of the state is under the jurisdiction of the Bureau of Air Quality, except for Clark and Washoe counties. These two counties fall under the jurisdiction of the Clark County Health District and the Washoe County District Health Department, respectively. The project sites and path fall under the jurisdiction of the BAQ. The BAQ is responsible for, but not limited to, the following in regards to air quality:

- Implementing and enforcing state and federal regulations to prevent, abate, and control air pollution from all stationary and temporary sources;
- Regulating facilities throughout the state which generate electricity using steam produced by the burning of fossil fuels;

- Issuing air quality operating permits;
- Implementing an alternative fuels program for public agency fleets with more than ten vehicles;
- Conducting investigations, research, and technical studies; and
- Monitoring ambient air quality.

Air quality in Nevada is also subject to Nevada's Revised Statute 445B.100. This statute states:

> It is the public policy of the State of Nevada...to achieve and maintain levels of air quality which will protect human health and safety, prevent injury to plant and animal life, prevent damage to property, and preserve visibility and scenic, aesthetic and historic values of the state.

It is the responsibility of the BAQ to make sure that this statute is enforced.

3.12.2 AFFECTED ENVIRONEMNT

Air quality in a region is determined by its topography, meteorology, and existing air pollutant sources. These factors are discussed below.

CLIMATE AND METEOROLOGY

Ambient air quality is commonly characterized by climatological conditions, the meteorological influences on air quality, and the quantity and type of pollutants released. The project is located in the northeastern region of Nevada, specifically in Elko, Eureka, Lander, and White Pine counties. The following section describes pertinent characteristics of this area and provides an overview of the physical conditions affecting pollutant dispersion.

Regional Climate

The project area is located in the northeastern portion of the State of Nevada. The 345 kV transmission line would connect the Falcon and Gonder substations. The Falcon substation lies approximately 40 miles west of Elko within Eureka County. The Gonder substation lies approximately 10 miles northeast of Ely within White Pine County. The region is characterized by a relatively simple terrain consisting of moderate mountain ranges separated by expanses of flat topography. Nevada is bounded on the west by the Sierra Nevada Mountains, which suppress maritime climate effects due to the Pacific Ocean.

The regional climate is a desert, continental-type climate. Surrounding mountains shield the area from arctic cold masses from the north and maritime effects from the west. Winters are characterized as moderately cold with notable amounts of snowfall. Summers are also moderate with occasional light rainfall.

Moderate temperatures characterize the project area, with annual average high temperatures of 65 degrees Fahrenheit (°F) at the Ely climatological station, the closest station to the Gonder substation. Average daytime high temperatures range from near 90°F in July to 40°F in January. Average overnight low temperatures range from 50°F in July to 10°F in January. Depending on the season, precipitation varies greatly in the project area. Daily mean rainfall ranges from 6 inches in spring to less than 1 inch in July and occurs almost year round. Snowfall occurs from October to late May, with daily means of 3.5 inches in December (DRI 2000). These observed data are from the Ely climatological station and do not vary significantly for the Elko station located about 120 miles north.

Winds across the project area are an important meteorological parameter because they control the dilution of locally generated air pollutant emissions and their regional trajectory. Southwest winds are predominant at the Elko station almost year round. Mean wind speeds range from 5 mph to 7 mph at this site. South winds dominate at the Ely station, with mean wind speeds of 10 mph.

Meteorological Influences on Air Quality

Regional flow patterns affect air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions, such as moderate winds, disperse pollutants and reduce pollutant concentrations. When a warm layer of air traps cooler air close to the ground, an inversion layer is produced. Such temperature inversions hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

CRITERIA AIR POLLUTANTS

Currently, efforts to improve air quality in the United States are focused on the control of five pollutants, called "criteria" air pollutants: photochemical oxidants (ozone), carbon monoxide (CO), particulate matter (PM_{10}), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Fifteen years ago, suspended particulate lead would have been included in this list, but the widespread availability and use of unleaded gasoline has effectively eliminated lead as an air quality concern. Criteria pollutants, including their formation and health effects, are discussed below.

Ozone

Ozone (O_3) is a colorless gas with a pungent odor that causes eye irritation and respiratory function impairment. Most O_3 in the atmosphere is formed as a result of the interaction of ultraviolet light, reactive organic gasses (ROG), and NO_X. ROG is composed of non-methane hydrocarbons, and NO_X consists of chemical combinations of nitrogen and oxygen, mainly NO and NO_2. Motor vehicles are the primary source of ROG and NO_X. Since both reactants can be transported over long distances from their sources, ozone is considered a regional pollutant.

Volatile Organic Compounds (VOCs)

Reactive organic gases, also know as volatile organic compounds (VOCs), are compounds containing hydrogen, carbon, and possibly other elements. In the presence of sunlight and nitrogen oxides, these compounds react to form ground-level ozone. Vehicles, solvent use, gasoline evaporation, and industrial processes are common sources of VOCs.

Fine Particulate Matter (PM_{10})

PM_{10} is atmospheric particles resulting from fume-producing industrial and agricultural operations, as well as natural activities. Health impacts from breathing the particulates resulted in revision of the Total Suspended Particulate (TSP) standard to reflect particulates that are small enough to be inhaled (i.e., 10 microns or less in size). Current standards define acceptable concentrations of particulates that are smaller than 10 microns in diameter, referred to as PM_{10}. PM_{10} includes materials such as sulfates and nitrates, which can cause lung damage.

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas that causes a number of health problems including fatigue, headache, confusion, and dizziness. The incomplete combustion of petroleum fuels in on-road vehicles is a major cause of CO. Wood-burning stoves and fireplaces are another source of CO. This pollutant tends to dissipate rapidly into the atmosphere; consequently, violations of the CO state standard are generally limited to major intersections during peak hour traffic conditions.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is an indirect product of fuel combustion in industrial sources, motor vehicles, and other mobile sources (e.g., off-road vehicles, trains, aircraft, mobile equipment, and utility equipment). NO_2 causes a number of health problems including risk of acute and chronic respiratory disease.

Sulfur Dioxide

The major source of SO_2 emissions is fuel-burning equipment in which fuel oil and/or coal are consumed. SO_2 causes a number of health problems including aggravation of chronic obstructive lung disease. Construction and/or operation of the Falcon to Gonder project would result in a very negligible amount of SO_2; it is therefore not discussed further in this section.

EXISTING AIR QUALITY MONITORING DATA

Air pollutant concentrations are measured at monitoring stations throughout the state. However, the stations are primarily used to assess population exposure, and the measurements are taken close to urban centers or busy roadways. Baseline air quality in the project area can be inferred from ambient air quality measurements conducted at Elko, Carson City, and Stateline. The Elko station contains PM_{10} measurements dating back to 1992. The Carson City and Stateline stations are located approximately 300 miles west of Ely. The Carson City station contains carbon monoxide and ozone data. The Stateline station contains nitrogen dioxide measurement data. Both the Stateline and Carson City monitoring stations are located a fair distance from the project area. These stations are located in more densely populated areas and would provide a conservative indication of the air quality expected at the project area between Elko and Ely. As shown in Table 3.12-2, station data indicate that there have been no exceedences of either federal of state air quality standards in the project area for the period of analysis (i.e., 1996-1998).

Attainment of carbon monoxide federal and state ambient air quality standards are measured for both 1-hour and 8-hour average periods. Thus, "0/0" indicates that the CO 1-hour threshold was exceeded 0 days out of the year and the CO 8-hour threshold was exceeded 0 days. The parenthesis following "State Standard" and "Federal Standard" under carbon monoxide (Table 3.12-2) indicates that the first number corresponds to the 1-hour standard and the second number corresponds to the 8-hour average standard (1-hr/8-hr avg.).

SENSITIVE RECEPTORS

The term "sensitive receptor" refers to specific population groups, as well as the land uses where they would reside for long periods. Commonly identified sensitive population groups are children, the elderly, the acutely ill, and the chronically ill. Commonly identified sensitive land uses are residences, schools, playgrounds, childcare centers, retirement homes or convalescent homes, hospitals, and clinics.

To identify potential sensitive receptors that could be impacted by project air emissions, a land use survey was conducted by Stantec in July 2000 using a helicopter and global positioning system. This survey identified approximately 30 buildings (mostly residences) within 1,000 feet and 280 buildings within 1.5 miles of the Crescent Valley (a) route (as measured from the proposed centerline). The Crescent Valley (b) route has approximately 34 buildings within 1,000 feet and 355 buildings within 1.5 miles. The Pine Valley (a) route has approximately 18 buildings within 1,000 feet and 213 units within 1.5 miles, while the Pine Valley (b) route has about 22 within 1,000 feet and 288 units within 1.5 miles. The Buck Mountain route has about 14 buildings within 1,000 feet and 173 buildings within 1.5 miles. Segments A, B, H, I, and J are the only ones with homes within 1,000 feet of the centerline (Stantec

2000). Other sensitive receptors such as schools, churches, and hospitals are not found within 1.5 miles of the ROW.

EXISTING ATTAINMENT STATUS

Air quality attainment status is determined by comparing actual monitoring data with state and federal standards. If a pollutant concentration is lower than the standard, the pollutant is classified as "attainment" in that area. If an area exceeds the standard, the pollutant is classified as "non-attainment." If data are insufficient to determine whether or not the standard is exceeded, the area is designated "unclassified." A "maintenance area" for a given pollutant refers to an area that is in attainment for the pollutant and there exists an approved State Implementation Plan that would keep pollutant levels from exceeding the NAAQS.

White Pine County and Elko County are currently designated as federal maintenance areas for all criteria pollutants. Title 40 of the Federal Code of Regulations establishes thresholds of 100 tons per year for each of those criteria pollutants (i.e., VOC, CO, PM_{10}, and NO_X) to be used in assessing general conformity under the Clean Air Act.

TABLE 3.12-2: SUMMARY OF ANNUAL NEVADA AIR QUALITY MONITORING DATA

POLLUTANT	1996	1997	1998
OZONE (O_3)[a]			
State Standard (1-hr avg, 0.12 ppm)			
Federal Standard (1-hr avg, 0.12 ppm)			
Maximum Concentration	0.08	0.09	0.08
Number of Days State Standard Exceeded	0	0	0
Number of Days Federal Standard Exceeded	0	0	0
NITROGEN DIOXIDE (NO_2)[b]			
State Standard (0.05 ppm AAM)			
Federal Standard (0.053 ppm AAM)			
Annual Mean	0.01	0.01	0.03
Number of Days State Standard Exceeded	0	0	0
Federal Standard Exceeded	No	No	No
CARBON MONOXIDE (CO)[c]			
State Standard (1-hr/8-hr avg, 35/9 ppm)[d]			
Federal Standard (1-hr/8-hr avg, 35/9 ppm)			
Maximum Concentration (1-hr/8-hr)	10.2/4.7	9.7/5.4	10.5/4.6
Number of Days State Standard Exceeded	0/0	0/0	0/0
Number of Days Federal Standard Exceeded	0/0	0/0	0/0
SUSPENDED PARTICULATES (PM_{10})[e]			
State Standard (24-hr avg, 150 g/m^3)			
Federal Standard (24-hr avg, 150 g/m^3)			
Maximum Concentration	119	52	103
Number of Samples Exceeding State 24-hr Standard	0	0	0
Number of Samples Exceeding Fed 24-hr Standard	0	0	0

a Data collected at Stateline monitoring station.
b 1996 and 1997 data collected at Stateline station, 1998 data collected at Reno monitoring station.
c Data collected at Carson City Long Street and Roberts House stations.
d State standard applied for sites located at less than 5,000 feet.
e Data collected from Elko monitoring station.
ppm : parts per million *AAM : annual arithmetic mean*
g/m^3 : micrograms per cubic meter *NA : not available*

Source: Nevada Division of Environmental Protection, Air Quality Data, 1996,1997,1998.

CLASS 1 LANDS

Class 1 federal areas can be National Parks, National Wilderness Areas, and National Monuments. All Class 1 areas are given special air quality protection under the federal Clean Air Act. 40 CFR Section 51.307 requires the operator of any new major stationary source or major modification located within 100 kilometers (62 miles) of a Class 1 area to contact the federal land manager for the area and provide information on the source emissions and potential impacts to the Class 1 area.

Nevada contains one Class 1 designated area, the Jarbridge Wilderness Area in the northeastern corner of the state. The Falcon substation (the nearest project facility) lies over 125 miles to the southwest of this Class 1 area. As a result, no action has to be taken to contact the federal land manager since this project is considered a minor impact on the protected region.

3.12.3 ENVIRONMENTAL CONSEQUENCES

This section presents an analysis of the impacts and mitigation measures for temporary air quality impacts during construction. Fugitive dust and emissions from construction equipment exhaust are the main concern in evaluating short-term air quality impacts. Long-term impacts would be negligible since emission-related activities associated with operation of the project would be limited to periodic maintenance trips.

SIGNIFICANCE CRITERIA

For this analysis and in accordance with Federal Clean Air Act General Conformity Requirements, a significant air quality impact would occur if project generates emissions of:

- If NO_2, VOC, CO, or PM_{10} would exceed 100 tons per year for each pollutant.

ENVIRONMENTAL IMPACTS - COMPARISON OF ALTERNATIVES

Impacts Common to all Route Alternatives

Construction activities associated with the Falcon to Gonder project would temporarily generate NO_X, VOCs, CO, and PM_{10} emissions during clearing, grading, and general construction activities. Emissions would be generated during the clearing of vegetation and site grading for the towers. Additional construction emissions would occur at the substations as those sites are being expanded, and during preparation of the right-of-way to access the tower sites. Within the ROW, some existing roads would be upgraded to include four wheel drive routes and two-track roads. Detailed construction activities for each of these project components are addressed below. The entire construction process is anticipated to last approximately 15 months.

Substation construction would begin with site clearing and grading. Reinforced concrete slabs would be installed to support the structure, equipment, and the control building. Trenches would have to be dug to place conduit, which would be used for electrical control cables. The trenches would be backfilled to the adjacent grade of the land. The control buildings would consist of pre-fabricated steel structures, as would all other shelters for housing electrical conductors, switches, and instrument transformers.

Along the route, the transmission lines would be supported by H-frame towers which require that two supporting steel poles be embedded in the ground. These structures would be partially assembled at material staging areas and delivered to the sites for final assembly and erection.

ROW preparation would provide access roads for the placement of the approximately 800 towers needed to support the transmission line from Falcon to Gonder. Existing roads would be upgraded through spading, widening, curve widening, tree removal, and adding turnouts. New roads would also be constructed as needed.

Emissions generated during the clearing of vegetation and excavation for the installation of the tower structures and ROW preparation would vary substantially from day to day depending on the level of activity, the specific construction activity, and weather conditions. Emissions associated with general construction activities include emissions resulting from the transport of workers, machinery and supplies, and emissions produced on-site during general building construction. Estimated construction emissions are summarized in Table 3.12-3.

The peak months of activity would include simultaneous ROW preparation, construction and placement of the transmission towers, and expansion at the substations. Results presented in Table 3.12-3 are based on the following assumptions: (1) no more than 4 acres of land would be disturbed in a day; and (2) all equipment runs for six hours per day during this peak period of construction, with the maximum number of employees on-site.

TABLE 3.12-3: CONSTRUCTION RELATED EMISSIONS (TONS/YEAR)

Pollutant	On-Site	Off-Site	Total
VOCs	5.7	0.3	6
NO_x	55.5	0.5	56
PM_{10}	44	<1	44
CO	35	1	36

As indicated, none of the construction-related emissions exceed the federal conformity limits of 100 tons per year. In addition to the low levels of emissions, the construction activities would be temporary and of short duration near any of the sensitive receptors; therefore, these emission levels would be a minor impact.

SPPC has already agreed to restore dirt roads requiring improvements to a condition as good or better than they were before project implementation. They have offered to implement erosion control measures on steep slopes, reseeding some areas, and closing some roads to discourage use and further generation of dust by vehicle travel. Long-term PM_{10} emissions are anticipated to be minimal. Additionally, construction emissions are of short duration; therefore, construction activities would not degrade regional air quality. However, PM_{10} emissions generated from these activities may pose nuisance type problems for close residents. These nuisance type impacts include, but are not limited to, reduced visibility and dust settlement on vehicles or property.

❑ ***Impact Air-1: Construction-Related Air Emissions***

Construction activities associated with the transmission line would temporarily produce emissions of NO_X, VOCs, CO, and PM_{10}. Emissions would vary substantially from day to day, but the annual emissions would not exceed the annual federal thresholds. As a result, construction-related emissions would be considered a short-term minor impact.

❑ ***Mitigation Measure Air-1***

The following mitigation measures are recommended in addition to those proposed by SPPC to further limit PM_{10} impacts to any local residents:

(a) Water all active and accessible construction areas, excluding areas that are either inaccessible due to terrain or the location of sensitive resources, or are over two miles from any sensitive receptors. An alternative to watering is to apply non-toxic soil stabilizers. Watering requirements can be waived by the BLM's Compliance Inspector in areas covered with snow, if the soil is already saturated, or if there isn't substantial dust generated by construction vehicle traffic.

(b) Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard, which is the distance from the top of the truck bed to the material being hauled.

(c) Sweep streets (with water sweepers) if visible soil material is carried onto adjacent paved public streets.

(d) Hydroseed apply (non-toxic) soil stabilizers, or reclaim and revegetate inactive construction areas that are not scheduled for any further construction activity.

(e) Enclose, cover, and water or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc. over 50 cubic yards).

(f) Limit traffic speeds on unpaved access roads to the safe pre-construction speed limit as posted or determined by the highway patrol, county, or local users. Speeds along remote access roads and the centerline travel route should be reduced to prevent excessive amounts of construction related dust, as necessary.

(g) Replant vegetation in disturbed areas as stated in the COM Plan.

❑ ***Impact Air-2: Operational emissions associated with maintenance surveys of the lines and towers may produce CO, PM_{10}, NO_x and VOC emissions***

Once a year on all segments, two linemen on all-terrain vehicles (ATVs) would patrol the transmission line and conduct maintenance surveys. The ATVs would require either gasoline or diesel fuel. Combustion of either of these fuels would generate emissions. PM_{10} may also be generated as the ATVs travel on unpaved roads. This would be a minor impact.

ATVs are either two-stroke or four-stroke engines, powered by either diesel fuel or gasoline. The two-stroke engines emit ten times more smog precursors per mile than the four-stroke engines. The 1990 Clean Air Act also requires these vehicles to use reformulated gasoline, thus reducing combustion-related emissions. It is anticipated that no more than two maintenance crew members would be out conducting line and tower surveys per year. Regardless of the type of engine and fuel consumption, the limited crew and number of the trips make this a negligible contribution to air quality and, therefore, a minor impact.

Travel on unpaved roads would also generate fugitive dust. The vehicle wheels would break-up the ground underneath, leaving this area susceptible to wind effects and turbulent wake effects from the tires passing over the area. The loosened material would be lofted into the atmosphere, degrading visibility and acting as a health hazard to any potential sensitive receptors in the area. There are also nuisance-type effects due to fugitive dust, such as settlement on nearby objects. The amount of fugitive dust generated correlates linearly with the volume of traffic on the road. Other factors include soil characteristics, such as silt content and moisture content. Since it is anticipated that there would be only two vehicles traveling the access roads once a year, this would be a minor impact. As no significant impacts are anticipated from the maintenance surveys, no mitigation measures are proposed or required.

Clean Air Act Conformity

The Clean Air Act Amendments of 1990 require federal agencies to ensure that their actions are consistent with the Clean Air Act and with federally enforceable air quality management plans (e.g., the State Implementation Plan). The conformity assessment process is intended to ensure that federal

agency actions: (1) would not cause or contribute to new violations of NAAQS; (2) would not increase the frequency or severity of any existing violations of ambient air quality standards; and (3) would not delay the timely attainment of ambient air quality standards.

White Pine County and Elko County are currently designated as federal maintenance areas for all criteria pollutants. Title 40 of the Federal Code of Regulations establishes thresholds of 100 tons per year for each of those criteria pollutants (i.e., VOC, CO, PM_{10}, and NOx) to be used in assessing general conformity under the Clean Air Act. Implementation of the Falcon to Gonder project would result in short-term regional air quality impacts from construction activities. Table 3.12-3 lists the levels of pollutant emissions anticipated from this activity. They are all well below the 100 tons/year threshold. Operational impacts are expected to be minimal.

Based on the analysis of short-term construction and negligible long-term operational emissions, implementation of the project along any of the route alternatives would comply with the general conformity requirements of the Clean Air Act with respect to VOC, CO, PM_{10}, and NO_x. As the Falcon to Gonder project would conform to all requirements of the Clean Air Act, no mitigation measures are proposed or required.

Gaseous Effluents

Corona activity on electrical conductors surrounded by air can produce very tiny amounts of gaseous effluents: ozone and NO_x. Ozone is a naturally occurring part of the air, with typical rural ambient levels around 10 to 30 parts per billion (ppb) at night and peaks of 100 ppb and higher (EPRI 1982:199). In urban areas, concentrations greater than 100 ppb are common. After a thunderstorm the air may contain 50 to 150 ppb of ozone, and levels of several hundred ppb have been recorded in large cities and in commercial airliners. Ozone is also given off by welding equipment, copy machines, air fresheners, and many household appliances. During wet weather, corona activity on 345 kV transmission lines may also produce very tiny amounts of ozone in the region next to the conductors.

The National Ambient Air Quality Standard for Oxidants is 120 parts-per-billion (ppb), not to be exceeded as a peak one-hour concentration on more than one day a year (the standard for NO_2 is 140 ppb). Ozone is the primary photochemical oxidant, representing 90-95% of the total. In general, the most sensitive ozone measurement instrumentation can measure about 1 ppb. Ozone calculations were performed using a computer program originally developed by the Bonneville Power Administration (BPA 1977). The calculated maximum concentration of ozone at ground level for the proposed 345 kV transmission line during heavy rain is about 1 ppb (and NO_x is even smaller). It is possible that a level this small could not be measured without special efforts, as it is over 100 times less than the National Ambient Air Quality Standard, and far less than ambient levels of 30-50 ppb and up to 150 ppb after thunderstorms (EPRI 1982: 199). Therefore, the proposed 346 kV transmission line would not create adverse effects in the ambient air quality of the project area.

Alternative-Specific Impacts

All potential adverse impacts are addressed in the previous section (i.e., Impacts Common to All Route Alternatives). As noted, all impacts associated with the project are considered minor and will be mitigated to less-than-significant levels. An analysis of potential minor impacts by route alternative or segment is not necessary, as there would be no segment-specific impacts or variables; all minor impacts and associated mitigation measures are listed above. In addition, no site-specific construction specifications have been developed.

Summary Comparison of Route Alternatives

TABLE 3.12-4: SUMMARY COMPARISON OF IMPACTS BY ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Air-1: Construction-Related Air Emissions	X	X	X	X	X
Impact Air-2: Operational emissions associated with maintenance surveys of the lines and towers may produce CO, PM_{10}, NO_X, and VOC emissions	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation, there may be minor residual impacts to the air quality. Depending on weather conditions and proximity of sensitive receptors, PM_{10} dust may cause temporary health and nuisance impacts. The exact nature of the residual impacts would also depend on the routes chosen, the amount of off-road travel, and land disturbance associated with specific construction activities. The centerline road would not be a public roadway and would be used only for the maintenance and inspection of the proposed facilities. For this reason, the residual air quality impacts related to addition off-highway vehicle use are not anticipated to be substantial.

The completed COM Plan will contain detailed mitigation measures requiring SPPC to make every effort to restore disturbed areas to pre-construction conditions. The COM Plan would also contain specific mitigation for re-vegetation of disturbed areas, as well as watering down exposed stockpiles. The COM Plan would also include monitoring protocols to ensure compliance with the mitigation measures. Any residual impacts associated with construction activities would be minimal due to compliance with the COM Plan and specific mitigation measures associated with Mitigation Measure Air-1.

NO ACTION ALTERNATIVE

Under the No Action Alternative, air quality impacts associated with this project would not occur. However, air quality impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

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3.13 LAND USE AND ACCESS

This section provides an overview of land use in the project area. It includes a description of the area of analysis and methodology and analyzes the project in relation to property ownership, land use plans, policies, authorizations, and access issues.

3.13.1 AREA OF ANALYSIS AND METHODOLOGY

The study area for this analysis includes a 3-mile wide corridor along the five route alternatives (i.e., 1.5 miles to each side of the centerline). The methodology involved a review of related county, state, and federal land use plans, as well as master title plats, geothermal plats, oil and gas plats, land use plats, and other land records at the BLM's Battle Mountain, Elko, and Ely Field Offices and the BLM Nevada State Office in Reno, Nevada. The data were compiled to assess potential land use impacts from the construction, operation, and maintenance of the transmission line.

REGULATORY FRAMEWORK

BLM Resource Management Plans

Use of public lands in the study area is planned and regulated by the BLM through its Resource Management Plans (RMPs) for the Shoshone-Eureka, Elko, and Egan planning areas. Relevant land use goals, policies, and objectives are discussed further below.

County Land Use Plans

Use of privately owned lands in the study area is planned and regulated by four county governments: Eureka, White Pine, Lander, and Elko counties. Relevant land use plans, goals, policies, and objectives are discussed below.

3.13.2 AFFECTED ENVIRONMENT

LAND OWNERSHIP STATUS

Two major categories of land ownership status were identified along the route alternatives: 1) federal (BLM) lands, and 2) privately held land. The BLM administers the vast majority of the land in the project area through three BLM Field Offices: the Battle Mountain Field Office, the Elko Field Office, and the Ely Field Office. Approximately 80% of the lands in the project area are managed by the BLM, with the remaining 20% of the lands in private ownership. Land ownership is shown in Figure 3.13-1.

The BLM grants land use authorizations which allow for private entities to use public lands for specific purposes. The majority of land use authorizations in the project area are in the form of rights-of-way for roads and utilities. The privately held lands in the project area are owned primarily by private corporations for mining purposes, or by individuals or families for grazing operations.

LAND USES IN THE STUDY AREA

Land uses within the study area fall within five main categories: 1) grazing allotment, 2) mining districts, 3) agriculture, 4) urban/industrial, and 5) transportation and access (see Table 3.13-1). As shown in Table 3.13-1, the vast majority of land in the project area is in grazing allotments (approximately 94%); these are open range lands used periodically for cattle grazing or that have the potential to be used for

grazing. Different allotments are grazed at different times of the year and at different intensities. Section 3.8, Range Resources, provides additional detail about grazing allotments.

TABLE 3.13-1: GENERALIZED LAND USES IN THE STUDY AREA

Land Use Category	Acres*	Percent	Number of Road Crossings
Grazing Allotment	303,600 -340,400	93.6 - 94.4	
Mining districts	27,900 -44,600	8.0 - 12.4	
Agriculture	5,200 – 9,300	1.6 - 2.6	
Urban/ Industrial	1,300 – 2,800	0.4 – 0.8	
Transportation and Access:			
Paved Roads			14
Dirt Roads			202
Total Crossings			**216**

**Rounded to the nearest 100 acres. Land use percentages do not add up to 100 due to overlap of lands used for both grazing allotments and mining districts. Ranges reflect the different lengths of the alternative routes.*

Sources: GIS analysis prepared by EDAW, Inc. using Stantec and Nevada Ownership 100K GIS database (Land Use categories). Road crossings prepared by EDAW, Inc., based on data provided by Stantec, Preliminary Route Selection Road access Exhibit, September 29, 1999.

There is a significant amount of overlap between lands within grazing allotments and mining districts. Mining districts are the second largest land use in the project area, representing approximately 8.0 – 12.4% of the study area. Not all lands within the mining districts are actively mined, and they only indicate generally the potential for extractive activities in these areas. Within the mining districts, there are a number of active mining claims.

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. There are approximately 122 active mining claims in the study area of which approximately 70 active claims are within or near the project ROW (Hirschman 2000). Existing large-scale mining operations, such as open pits and tailings, are counted as industrial uses under the urban/industrial land use category.

Significantly smaller amounts of land within the study area are used for agriculture (1.6 - 2.6%), including irrigated and non-irrigated crop lands, pasture, and range lands. These agricultural uses are largely contiguous with privately owned land in the project area. Some of the largest tracts of agricultural land occur in northern Eureka County near Interstate 80, as well as in central Eureka County north of the Town of Eureka and adjacent to Highway 278.

Urban/industrial uses constitute a very small proportion of the land uses within the study area (0.4 – 0.8%). These urban uses include development areas in the town of Crescent Valley, Eureka, Ely and McGill. Industrial uses include the open pits and tailings of the Cortez Mine.

Sierra Pacific Power Co.

FALCON to GONDER Project

Land Ownership

- U.S. Forest Service
- U.S. Bureau of Land Management
- U.S. Fish & Wildlife Service
- State Parks & Recreation
- American Indian Reservation
- Private

SPECIAL MANAGEMENT STATUS

- BLM —Wilderness Study Area (WSA)

TRANSMISSION LINE

- Route Alternatives

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

N

GIS Mapping by **EDAW, Inc.** — San Francisco

03/02/01

Figure 3.13-1

There are paved and dirt roads dispersed throughout the area. As shown in Table 3.13-1, there are over 200 road crossings in the study area (i.e., 14 paved roads and an estimated 202 dirt roads). Major paved highway crossings in the study area include the Interstate 80 highway and U.S. Highways 50 and 93, and State Routes 278, 306, and 892. In addition, two railroad lines would be crossed by the project near Interstate 80 along Segment A.

BLM LAND USE AUTHORIZATIONS

The Legacy Rehost 2000 Database located at the Nevada BLM State Office in Reno, Nevada, indicates that the BLM has 221 land use authorizations in the study area, comprising approximately 49,260 acres (BLM 2000)[1]. These land use authorizations are primarily ROWs 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 the Idaho Power Company, the Nevada Department of Transportation (NDOT), SPPC, White Pine and Eureka counties, Nevada Bell, and the BLM. However, many land use authorizations are also held by other entities, including road ROWs belonging to private individuals and telephone or transmission line ROWs belonging to smaller telecommunications companies.

MANAGEMENT PLANS AND POLICIES

Use of federal public land in the project area is planned and regulated by the BLM, and uses of privately owned lands are regulated by the counties of Eureka, Elko, Lander, and White Pine. This section describes the applicable land use plans and policies within the project area, including BLM Resource Management Plans and county land use plans as they relate to the project.

BLM Resource Management Plans

BLM Resource Management Plans (RMPs) 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 RMPs also provide standard operating procedures (SOPs) which are inherent to the implementation of any federal action on public lands, such as completing environmental analysis before project development.

The project would cross through three BLM planning areas: Shoshone-Eureka, Elko and Egan. Applicable land use objectives and policies from these RMPs are summarized below.

Shoshone-Eureka RMP

The Shoshone-Eureka planning area contains 4.4 million acres of public land in north-central Nevada administered by the Battle Mountain Field Office (BLM 1984a). The area includes three principal towns: Austin, Battle Mountain, and Eureka. It encompasses most of Lander and Eureka counties and a portion of Nye County. RMP management objectives related to land tenure adjustments and utility corridors (as related to the project) are listed below.

[1] Authorizations were calculated by providing the BLM State Office with township, range, and section data (from Stantec, Inc. GIS data) for the 3-mile wide study corridor. The database provided land authorizations by section. However not all authorizations would be traversed by, or adjacent to, the project ROW, making the number and size of the authorizations appear high. In addition, only a small portion of certain sections fall within the project area. Authorizations within these sections were also included in the database, also making the number and size of authorizations appear high.

Land Tenure Adjustments

- Increase opportunities for economic development by moderately increasing the amount of privately owned land within the planning area consistent with the objectives of the RMP.
- Adjust the land tenure pattern through the disposal of land from public to private holdings as requested by private citizens consistent with the objectives of the RMP.

Utility Corridors

- Ensure a system for transmission of utilities through the planning area by establishing an east-west and north-south network of utility corridors;
- Designate 112 miles of utility corridors, which include existing transmission lines, and identify an additional 167 miles of planning corridors.
- Require applicants for use of a corridor to locate new facilities proximate to existing facilities, except where considerations of construction feasibility, cost compatibility, resource protection, or safety are over-riding.
- Minimize adverse impacts to the environment by concentrating compatible rights-of-way in designated corridors that avoid sensitive resource values.

Elko Planning Area RMP

The Elko RMP is a long-range plan to manage public lands within the Elko planning area in north-central Nevada (BLM 1986). The planning area consists of three planning units, the North Fork, Buckhorn, and Tuscarora, which cover approximately 5.9 million acres in the western half of Elko County and northern portion of Lander and Eureka counties. Over 3.1 million acres are public lands administered by the BLM. Relevant land use management objectives related to land and realty, utility corridors, and access are summarized below.

Lands and Realty

- Allow disposals, land tenure adjustments, and land use authorizations.
- Make public land available by sale to meet community expansion needs, and to dispose of acreage that is difficult and uneconomic to manage.
- Identify public land for transfer through exchange.

Corridors

- Identify designated corridors and planning corridors in coordination with other multiple-use objectives.
- Designate 243 miles of ROW corridors, including 109 miles of low visibility corridor designation along Interstate 80.
- Identify 130 miles of planning corridors for future facilities.

Access

- Initiate procedures to acquire legal access for routes that would enhance opportunities to use public resources and provide for public land administration.
- Acquire legal access for 60 roads (242 miles) considered high priority for management of all resources.

Egan Planning Area RMP

The Egan RMP is a 20-year plan to manage 3.8 million acres of public land in east-central Nevada, managed by the Ely Field Office of the BLM (BLM 1984b). The majority of the Egan planning area is located in White Pine County, with portions in Nye and Lincoln counties. The RMP focuses on three

resource issues: rangeland management, realty actions, and wilderness study areas (WSA). Included in realty actions is a discussion of utility corridors. The overall objective of this plan is to provide a balanced approach to land management, protecting fragile and unique resources, while not overly restricting the ability of other resources to provide economic goods and services. A summary of the management objectives for realty actions is provided below. Objectives for WSAs are provided in Section 3.14.

Realty Actions

- Dispose of lands to provide for more effective management of the public lands in the planning area. Land disposals should not be in big game or upland game habitat or in wild horse herd management areas. All land disposal 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.
- 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 right-of-way, 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.

BLM's utility corridor policies are analyzed in more depth in Chapter 5, Resource Management Plan Amendments.

County Land Use Plans and Policies

Land use in the project area is also governed by four counties. A description of the general land uses within Eureka, White Pine, Lander, and Elko counties is provided below, as are relevant land use plans and policies.

Eureka County

Land use patterns within Eureka County evolved from economic activities such as mining and agriculture. The greatest land use in the county is agricultural open space, comprised of designated grazing allotments. Approximately 2.4 million acres (90% of lands) are used for cattle and sheep grazing and pasture, as well as for crops such as hay or barley. Mining districts represent the next largest land use designation in the county. Superimposed over these allotments and mining districts, the U.S. Department of Defense has designated certain areas with the county as special use airspace for military training (Eureka County 1997).

The majority of Eureka County is sparsely populated, and most of the residential development is associated with agriculture and ranching. The majority of lands within the county boundary fall under the management authority of the BLM and the US Forest Service. The County of Eureka manages primarily privately owned land in and around the Town of Eureka, as well as a checkerboard pattern of private land in the northern portion of the county.

One of the largest tracts of privately owned land in the county is located in Boulder Valley, north of Interstate 80. Lands in this area, encompassing approximately 530 square miles, are primarily used for agriculture, livestock grazing, mining, and outdoor recreation. Two of the largest gold mining operations in North America, Barrick and Newmont, are located in this area. Other major private land holdings in other areas of the county occur south of Palisades at the northern end of Pine Valley.

Eureka County has four principal towns: Eureka, Diamond Valley, Crescent Valley, and Beowawe. The Town of Eureka is the largest; it has a population of approximately 1,800 and is the County Seat. The commercial core of Eureka occurs primarily at the intersection of US Highway 50 and State Route 278. Surrounding the commercial core are primarily residential land uses with other mixed uses interspersed. The residential areas contain a mixture of conventional housing, modular homes, and mobile homes. A number of historic buildings and homes related to historic mining activities are also located in Eureka. (Eureka County 1997).

The Land Use and Public Lands element of the General Plan was last updated on 1998, and formally adopted into the Eureka County Master Plan in June, 2000 (personal communication with John Hutchings, Public Lands Department, March 5, 2001). The General Plan recognizes six basic types of land use categories in Eureka County:

- Urbanized Areas;
- Permanent Open Space;
- Open Space and Appropriate Associated Uses;
- Agriculture Only, Associated Housing;
- Agriculture, Mining, Limited Housing; and
- Agriculture, Mining, Very Limited Housing.

The proposed project segments within Eureka County are located primarily in the land use category Agriculture, Mining, Very Limited Housing. Eureka County has no adopted zoning ordinance.

Eureka County Master Plan (1997)

The Eureka County Master Plan is a comprehensive, long-term general plan for the physical development of the county, and serves as a basis for the development of the county into the foreseeable future.

The Eureka County goals and policies related to utilities are listed below.

- Goal 16.0: To achieve the efficient use of energy in the county land use pattern, transportation systems, building forms, and consumption patterns.
- Policy 16.1: The county must work closely with all utility providers so that utility services conform to adopted plans, services are on-line when needed, and utility extensions are not used to create a different land use pattern.
- Utility System Recommendations: Future utility improvements should be planned to be consistent with proposed land use patterns (Eureka County 1997).

White Pine County

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. The majority of the land outside of the established communities is designated as Open Range or Federal Reserve. The proposed SPPC route alternatives would be within these land use designations.

Lands within the Open Range designation comprise the vast majority of the land within 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 it to maintain and encourage the resource and

open space uses and value of the land. The corresponding zoning district includes the Open Range District and the Ranch Estates Districts, both with a 5-acre minimum parcel size requirement.

White Pine County Land Use Plan (1998)

The White Pine County Land Use Plan is intended to guide development of land resources in the county through the year 2017. Sustaining environmental values and promoting expansion and diversification of the regional economy are important goals of the plan. The White Pine County Land Use Plan describes land use issues within the county, as well as within 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 (Goal 4.0).

White Pine County Public Land Use Plan (1998)

The White Pine County Public Land Use Plan provides a coordinated land use planning effort among the county, the BLM, and the US Forest Service. The plan was developed by the White Pine County government to guide the use of public lands and resources within 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 Public Land Use Plan applies to public lands designated as Open Range and Federal Reserve in the White Pine County Land Use Plan.

Lander County

Lander County contains five land use designations: Residential, Commercial, Office Commercial, Industrial, and Agriculture (Lander County 1997). Outside the towns of Austin, Battle Mountain, and Kingston, lands are primarily used for agriculture or open space. The portions of the project that would be located within Lander County would pass through lands designated as Agriculture and are within the A-3 Zoning District (Lander County 1997). The A-3 Zoning District, described as the Farm and Ranch District, allows for 20-acre minimum parcel sizes. A number of uses are permitted in this district, including single-family homes, farms and farm-related buildings, recreational and educational uses, as well as utility serving centers, provided they are not located closer than 200 feet from land classified in the Residential District.

Lander County Master Plan (1997)

The Lander County Master Plan is a comprehensive, long-term general plan for the physical development of the county and the communities of Austin, Battle Mountain, and Kingston. It sets forth policies and action programs for the county to follow when making decisions concerning the county's future. The Master Plan has been formulated for a 15-year planning horizon and covers such topics as conservation of natural resources, historic preservation, land use, population and housing, economics, recreation, community design, and public facilities and services.

The land use goals of Lander County are to create growth patterns consistent with designated types, amounts, and intensities of land uses coordinated with cost-effective public service delivery, to develop and utilize vacant lands within Lander County communities, and to preserve agricultural and ranching lands and associated uses. The Master Plan has no land use policies related specifically to utilities or utility corridors, although Policy P4-9 does encourage the provision of buffer zones between major industrial, commercial, and residential areas, as well as the protection of agricultural lands.

Lander County Revised Policy Plan For Federally Administered Land, Draft (1999)
This plan addresses federal land use management issues directly by establishing a set of principles or specific guidelines. Although the plan has no land use policies related specifically to utilities or utility corridors, Lander County supports the concept of Multiple Use Management as an overriding philosophy for management of the federally administered lands. The policies adopted provide for the management and utilization of federally administered lands based on multiple use and sustained yield concepts, and in a way that would conserve natural resources.

Elko County
The primary land uses in Elko County outside of populated areas are agriculture, dispersed recreation, and mineral exploration. The portion of the project that would be located in Elko County would pass through lands designated as Parks, Recreation, and Open Space. This area also lies within the county's Open Space Zoning District.

The Parks, Recreation, and Open Space land use designation consists of both public and private lands used by the public for parks and outdoor recreation. It also includes natural resource and wildlife preservation areas for the public use and enjoyment (Elko County 1996). The Open Space Zoning District is intended to protect agricultural areas from urban development of residential subdivisions, and to serve as an open space area around the more intensive urban uses of Elko (Elko County 1976). Permitted uses include farming and ranching activities, as well as noncommercial seasonal recreation activities. Utilities or public service facilities, when operating requirements necessitate its location, are conditional uses within the Open Space District.

Elko County Master Plan (1996)
The Elko County Master Plan is a 15- to 20-year plan to guide the physical growth of Elko County and the cities within it. The general land use goal stated in the Elko County Master Plan is to enhance existing land uses and to manage and guide future development to maintain the living and working qualities of Elko County. Land use policies relevant to the project include the following:

- Land Use Policy 3.1-11 encourages the county to protect existing utilities, public facilities, and transmission lines, and to provide for their future extension to serve all sectors of Elko County.
- Land Use Policy 3.1-6 encourages land uses that are harmonious with existing natural resources, scenic areas, vistas, and sight lines.

The public services, utilities, and energy element of the plan contains only goals and policies related to city services. No specific goals or policies related to long-distance transmission lines are included in this element.

3.13.3 ENVIRONMENTAL CONSEQUENCES

This section examines the project's potential effects on land use and access. The primary land use issues associated with the project are related to potential physical conflicts with land uses or restriction of access (e.g., conflicts with agricultural operations, grazing areas, mining operations, urban/industrial lands, or transportation routes). Other issues examined in this section include the project's potential conflict with the applicable land use and resource management plans of federal, state, and local agencies.

SIGNIFICANCE CRITERIA

Project construction and operation activities would be considered to have a significant impact on land use and access if they would:

- 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 (i.e., residential, commercial, industrial, governmental, or institutional).
- Conflict with an existing right-of-way.
- Substantially conflict with applicable general and regional plans and/or approved or adopted policies, goals, or operations of communities or governmental agencies.

ENVIRONMENTAL IMPACTS - COMPARISON OF ALTERNATIVES

Impacts Common to All Route Alternatives

The following section analyzes potential impacts to land use and access that would be common to all of the route alternatives.

Construction-related Land Disturbance

Table 2-5 in Chapter 2 estimates the amount of temporary land disturbance that would be associated with the project's construction. Given the fact that only 20% of the land in the project area is privately owned, construction-related land disturbance would occur on a relatively small amount of privately owned land, would be revegetated after construction, and thus would be a less-than-significant impact.

Impacts to Land Uses on Private Property

The project would be located in sparsely populated areas containing little or no development. Impacts to 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. In the few locations where the transmission would cross on or near privately owned residential properties, mining operations, or other sensitive land uses, the specific locations of towers would be discussed with landowners during right-of-way acquisition. Towers would be located to minimize impacts to land holders, land uses, and access roads.

As discussed in Section 3.15, Social and Economic Values, SPPC would compensate private land owners for use of a right-of-way easement across their properties. The compensation would be calculated by an independent real estate appraiser who would estimate a fair market value for the use of the easement, based on the location, size, and uses of the property, as well as negative impacts on surrounding property, if appropriate.

Table 3.13-2 identifies the generalized land uses in the 3-mile wide study area corridor, breaking them down by segment and route alternative. Table 3.13-3 identifies the number of private parcels that would be crossed by each of the route alternatives. Table 3.13-4 identifies the main types of developed land uses that would be within 1,000 feet and within 1.5 miles of the centerline. A detailed list of private developments within the study area is provided in Appendix D.

TABLE 3.13-2: GENERALIZED LAND USES IN THE STUDY AREA*

Segment	Total Area	Public (BLM)		Private (non-BLM)		Grazing Allotment		Mining Districts		Agriculture		Urban/ Industrial	
	Source:	*(BLM 1999)*		*(BLM 1999)*		*(Nevada BLM GIS)*		*(Nevada - Bureau of Mines & Geology)*		*(USFWS - Gap Analysis)*		*(USFWS - Gap Analysis)*	
	Acres	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
A	36,454	6,691	18.4%	29,762	81.6%	16,172	44.4%	1,543	4.2%	1,487	4.1%	0	0.0%
B**	113,732	88,576	77.9%	25,156	22.1%	113,732	100.0%	21,732	19.1%	1,254	1.1%	1,477	1.3%
C	68,217	32,363	47.4%	35,855	52.6%	68,217	100.0%	6,661	9.8%	777	1.1%	0	0.0%
D	32,962	32,924	99.9%	38	0.1%	32,962	100.0%	225	0.7%	0	0.0%	0	0.0%
E	138,246	133,942	96.9%	4,304	3.1%	137,828	99.7%	25,048	18.1%	2,568	1.9%	0	0.0%
F	36,743	35,179	95.7%	1,564	4.3%	36,743	100.0%	5,700	15.5%	1,125	3.1%	0	0.0%
G	33,568	32,500	96.8%	1,068	3.2%	33,568	100.0%	1,241	3.7%	0	0.0%	0	0.0%
H	34,206	31,167	91.1%	3,039	8.9%	34,206	100.0%	3,151	9.2%	2,585	7.6%	0	0.0%
I	58,183	54,013	92.8%	4,170	7.2%	58,183	100.0%	8,767	15.1%	2,525	4.3%	50	0.1%
J	81,376	78,292	96.2%	3,084	3.8%	81,376	100.0%	3,741	4.6%	352	0.4%	1,264	1.6%
Route Alternative													
Crescent Valley													
(a)	360,055	295,251	82.0%	64,804	18.0%	339,774	94.4%	42,724	11.9%	6,743	1.9%	2,790	0.8%
(b)	360,693	293,918	81.5%	66,775	18.5%	340,412	94.4%	44,635	12.4%	9,328	2.6%	2,790	0.8%
Pine Valley													
(a)	347,502	271,961	78.3%	75,541	21.7%	327,221	94.2%	27,878	8.0%	6,266	1.8%	1,314	0.4%
(b)	348,140	270,628	77.7%	77,513	22.3%	327,859	94.2%	29,789	8.6%	8,851	2.5%	1,314	0.4%
Buck Mountain													
	324,293	251,288	77.5%	73,005	22.5%	303,594	93.6%	36,992	11.4%	5,184	1.6%	1,264	0.4%

* *The study area comprises a 3-mile wide corridor along Segments A through J.*

** *Land use acres and percentages for the L and K re-routes are included within Segment B.*

❑ *Impact Land Use-1: Right-of-way Acquisition and Potential Loss of Property Value*

Over the long-term, the land directly under the towers would be removed from private use and future development (see Table 2-6 for acreage required for towers). Some restrictions on land use within the right-of-way would also be necessary to avoid conflicts with the transmission line. The transmission line could also potentially interfere with land uses on properties adjacent to the right-of-way (e.g., cultivation of row crops) and, thus, potentially reduce property value.

❑ *Mitigation Measure Land Use-1*

Land use restrictions within the right-of-way and potential loss of property value would be considered during the right-of-way acquisition process, and SPPC would pay appropriate compensation to private land owners, as discussed above and in Section 3.15, Social and Economic Values, thereby mitigating this potentially significant impact to a less-than-significant level.

TABLE 3.13-3: PRIVATE PARCELS AND LANDOWNERS WITHIN THE PROJECT ROW

Segment	Total Number of Parcels	Total Number of Owners	Number of Developed Parcels/Owner	Type of Development*
A	12	6	1 (APN 004-220-11): Newmont Gold Co.	1 mobile home, 1 fixed residence, and 1 mining area
B**	32	21	2 (APN 007-660-03, -07): Tehama Holdings Inc.	3 mobile homes and 3 travel trailers
C	28	20	0	n/a
D	0	0	0	n/a
E	25	5	0	n/a
F	1	1	0	n/a
G	0	0	0	n/a
H	7	7	0	n/a
I	7	6	2 (APN 007-340-13): John and Nancy Minoletti, (APN 009-090-10): Rapone Family Trust	1 ranch house (Minoletti) 2 ranch houses (Rapone)
J	8	6	0	n/a
Total	**120**	**72**	**6**	
Route Alternative				
Crescent Valley				
(a)	60	40	See Segments A, B and I above	See Segments A, B and I above
(b)	67	47	See Segments A, B and I above	See Segments A, B and I above
Pine Valley				
(a)	56	39	See Segments A and I above	See Segments A and I above
(b)	63	46	See Segments A and I above	See Segments A and I above
Buck Mountain				
	73	37	See Segment A above	See Segment A above

** EDAW GIS analysis using Stantec helicopter reconnaissance (July 2000) and Parcel Database*

*** Includes private parcels within the L re-route. No private parcels are within the K re-route.*

Source: SPPC 2000. Ownership Information for 100 ft. from Centerline.

TABLE 3.13-4: DEVELOPED LAND USES AND DISTANCE FROM CENTERLINE

Segment	Number of Units by Land Use and Distance Categories							
	Residential		Commercial		Industrial		Public	
	1000 ft	1.5 mi	1000 ft	1.5 mi	1000 ft	1.5 mi	1000 ft	1.5 mi
A	1	6		1		1		
B*	11	68		1	1	4		1
C		5						
D						1		1
E		3						
F		2						
G		2				1		
H	3	74	1	3				1
I	3	29		1	1	4		3
J	12	154		1	1	4		1
Total	**30**	**343**	**1**	**7**	**3**	**11**	**0**	**7**
Route Alternative								
Crescent Valley								
(a)	27	261	0	4	3	10	0	5
(b)	30	333	1	7	3	9	0	6
Pine Valley								
(a)	16	198	0	3	2	7	0	5
(b)	19	270	1	6	2	6	0	6
Buck Mountain								
	13	168	0	2	1	2	0	1

** includes development near the L and K re-routes*

Source: EDAW GIS analysis from Stantec helicopter reconnaissance (July 2000)

Agriculture

Impacts to agricultural crops are generally expected to be low given the infrequency of row crops in the study area. Specific locations of transmission line towers on private ranch, range, or pasturelands would be discussed between the utility and the landowner to minimize interference with agricultural operations. Soil disturbance or compaction of soils on cultivated lands is expected to be short-term (i.e., during construction). A number of studies have been conducted on the effects of electric and magnetic fields on food crop production and yields (e.g. AEP 1979, PSU 1985b). No significant adverse effects on plants or crops have been identified.

Although the transmission line towers would 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 unrestricted beneath the transmission lines. Therefore, the project would result in minimal impacts to grazing and agriculture. Section 3.8, Range Resources, provides a more detailed analysis of the impacts to livestock grazing.

Potential Impacts to Mining

Section 3.1, Geology and Minerals, provides an analysis of potential interference with active mining operations and mining claims. Some of the information from Section 3.1 has been summarized here to consider the land use perspective. All of the route alternatives would cross mining districts (see Table 3.13-5). However, very few of these districts are currently being mined, and this land use category only generally indicates areas with mining potential.

TABLE 3.13-5: ACTIVE MINING CLAIMS IN THE STUDY AREA

Segment	In or adjacent to ROW	Out of ROW	Total
A	3	4	7
B*	49	20	69
C	1	1	2
D	1	0	1
E	7	11	18
F	0	0	0
G	0	2	2
H	2	6	8
I	7	6	13
J	0	2	2
Total	**70**	**52**	**122**
Route Alternative			
Crescent Valley			
(a)	59	34	93
(b)	61	38	99
Pine Valley			
(a)	12	15	27
(b)	14	19	33
Buck Mountain			
	11	18	29

Source: Hirschman, 2000.

**Mining claims within Segments L and K are included in Segment B due to the size of the claims. L would contain 1 claim in the ROW and K would contain 7 claims in the ROW and 2 out.*

Within these mining districts are approximately 122 active mining claims in the study area. Active mining claims are concentrated along Segments B, E and I. Segment B is unique to the Crescent Valley (a) and (b) route alternatives, while Segment E is unique to the Buck Mountain route. Segment I is common to

all of the route alternatives except Buck Mountain. The major gold companies with active claims in the study area are Placer Dome, Newmont Gold, Homestake Mining, Cortez Gold, and Oro Nevada Exploration. There are also a few individuals and some small gold exploration companies that have active claims in or near the ROW.

Through early communications with the existing mining companies, SPPC made efforts to site the route alternatives to avoid active mining claims and potential mineral development areas. If there are any mining rights associated with private lands or active claims on public lands, SPPC would attempt to evaluate and compensate for the loss of potential mining profits based on available information (e.g., existing records, site evaluations, etc.) in order to utilize the land to construct the proposed transmission line. As an alternative to compensation for loss to potential mining profits, SPPC and the landower or claim holder may negotiate a settlement covering relocation of the transmission line or specific towers so as to present no substantial limitation to the future development of any mining rights or claims (personal communication with John Berdrow, SPPC, March 22, 2001). Compensation for the loss of potential mining profits and the conditions for relocation would be site specific and handled on a case-by-case basis.

Potential Impacts to Transportation Routes

As shown in Table 3.13-6, all route alternatives would cross existing paved and unpaved dirt roads, as well as two railroad lines along Segment A. Final design of the selected route would place transmission towers to avoid conflicts with transportation routes. There would be a minimum of 26 vertical feet between the transmission lines and roadways, allowing adequate vertical clearance for most vehicles.

During transmission line stringing phases, it may be necessary to erect temporary structures over major roadways to position untensioned 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. The Nevada Department of Transportation (NDOT) would require a permit for every crossing of an NDOT ROW (NDOT 2000). SPPC would apply for these permits upon selection of the preferred route alternative. In some cases, the NDOT may require temporary road closures for some construction activities. This decision would be made during the NDOT permit application process, and would take into account traffic volumes and safety considerations. On major highways, these temporary closures (if required by the NDOT) would be coordinated with the Nevada Highway Patrol. For these reasons, the project would have no substantial adverse effects to transportation routes.

As discussed in Chapter 2, numerous existing dirt access roads have been identified for possible use during construction of the transmission line. Some of these dirt roads would require improvements to enable construction vehicles and large equipment to access the construction areas. In areas where existing roads closely parallel the new right-of-way, 30-foot wide spur roads could be cleared temporarily to provide access from the existing roads to the tower installation sites.

However, in most areas, a centerline travel route would be cleared to provide construction equipment access to the tower sites. The centerline travel route would be 12 to 15 feet wide in most places, but it would be expanded to about 30 feet wide in certain areas to allow for vehicle passing areas and turnouts. The centerline travel route and temporary spur roads would be revegetated and reclaimed after construction, as described in Chapter 2. About once a year, two SPPC line inspectors would ride ATVs along the centerline travel route to inspect the transmission line. Use of ATVs for annual inspections would, over time, create a 12-foot wide two-track path next to the transmission line.

TABLE 3.13-6: ROAD CROSSINGS BY SEGMENT AND ROUTE ALTERNATIVE

Segment	Number of Paved Road Crossings	Number of Dirt Road Crossings	Total Road Segment Crossings
A	1	7	8
B*	1	37	38
C	1	17	18
D	0	8	8
E	1	45	46
F	0	11	11
G	1	9	10
H	1	12	13
I	2	23	25
J	6	30	36
Total	**14**	**199**	**213**
Route Alternative			
Crescent Valley			
(a)	11	117	128
(b)	11	120	131
Pine Valley			
(a)	11	105	116
(b)	11	108	119
Buck Mountain			
	9	99	108

Source: EDAW, Inc., based on data provided by Stantec, Preliminary Route Selection Road Access Exhibit, September 29, 1999.
** includes the L re-route crossings. The L re-route would cross dirt roads (only) in approximately 3 locations. The K re-route would cross no roads.*

The improvements to existing access roads, the centerline travel route and temporary spur roads would not likely alter the underlying land use, nor have a substantial effect on existing development, given the large number of passable dirt roads that currently exist in the project area for such activities as recreational 4WD use or general sight-seeing. In addition, recreational travel on newly accessible roads not would not substantially conflict with existing development given the sparsely developed nature of the project area.

In general, the Crescent Valley (b) route alternative would cross the greatest number of paved and dirt roads, while the Buck Mountain route alternative would cross the fewest (see Table 3.13-6).
SPPC would coordinate with responsible agencies and property owners to acquire the appropriate approvals (e.g., temporary use permits) to use and, in some cases, to improve the access roads. SPPC would restore existing access roads to a pre-construction condition unless the upgraded road is requested by the property owners or the responsible agency. Issues related to specific access road improvements, authorization for use and level of reclamation needed would be described further in the COM Plan.

Potential Impacts to BLM Land Use Authorizations

All of the segments would traverse or be located adjacent to many existing BLM land use authorizations (see Table 3.13-7). These are primarily in the form of rights-of-way for other transmission lines, roads, telephone lines, water facilities, recreation or public purpose leases, airport leases, and material sites for road construction. In most cases, the proposed project would cross over or parallel the existing ROWs with little or no interference. Specific locations of towers would be designed to avoid these land use authorizations by spanning them with adequate distance between towers. This would reduce potential safety issues with crossing oil and gas pipelines, or material sites. SPPC would also properly ground nearby fences in order to minimize potential electrical induction situations (this and other health and safety issues are discussed further in Section 3.10). For these reasons, no substantial adverse effects to BLM land use authorizations are anticipated.

TABLE 3.13-7: BLM LAND USE AUTHORIZATIONS IN THE STUDY AREA

Segment	No. of Land Use Authorizations	Largest Land Holder(s) in Terms of Acreage	No. Land Use Authorizations Crossed	Land Holders Crossed
A	17	AT&T, Nevada Bell, NDOT, SPPC, Williams Communication	2	NDOT, Williams Communication
B*	37	Cortez Gold Mines, Eureka & Lander Counties, Nevada Bell, NDOT, SPPC, Santa Fe Pacific, Southwest Gas Corp.	5	Santa Fe Pacific, NDOT, Wells Rural Electric, Lander County, Southwest Gas Corp.
C	8	SPPC, NDOT, Hale W. Bailey, Edward R. Smith	2	NDOT, Southwest Gas Corporation,
D	6	NDOT, Nevada Bell, Wells Rural Electric	3	Citizens Communication, Wells Rural Electric, Mobile Oil Corporation
E	13	White Pine County, Mt. Wheeler Power Inc., NDOT, Placer Dome, Inc., Wells Rural Electric	6	BLM, NDOT, Nevada Bell, Wells Rural Electric, White Pine County, Mount Wheeler Power
F	10	BLM, Eureka County, NDOT	1	Eureka County
G	14	Federal Highway Administration, Nevada Bell, NDOT	3	NDOT, Nevada Bell, Mt. Wheeler Power
H	31	Eureka County, Mt. Wheeler Power Inc., NDOT	2	NDOT, Mt. Wheeler Power
I	62	Eureka County, Mt. Wheeler Power Inc., Nevada Bell, NDOT, White Pine County	9	Mt. Wheeler Power (3X), NDOT (2X), Nevada Bell (2X), SPPC, White Pine County
J	44	Idaho Power Co., Mt. Wheeler Power Inc., Nevada Bell, NDOT, SPPC, Nevada Division of State Lands, White Pine County	9	NDOT (3X), Mt. Wheeler Power Co., Nevada Bell (2X), FHA, White Pine County
Total**	**221****		**30****	

Source: BLM Legacy Rehost 2000 database

** Land use designations within Segments L and K have been included in Segment B. The L re-route would cross 2 land use authorizations (Lander Co., and Southwest Gas Corp.). The K re-route would cross no authorizations.*

*** To avoid double counting, column totals have been adjusted to account for authorizations occurring near, or crossing, multiple segments*

Potential Conflicts with Land Use Plans and Policies

RMP Policy Summary Regarding Utility Corridors

As shown in Figure ES-1 in the Executive Summary, portions of the proposed route alternatives would extend outside of designated utility corridors and planning corridors identified in the three BLM RMPs that cover the project study area. Potential conflicts with the RMP utility corridor policies are discussed below, as well as in more depth in Chapter 5, Resource Management Plan Amendments.

BLM Resource Management Plans and Policies

The Shoshone-Eureka, Elko, and Egan RMPs contain policies related to existing and planned utility corridors in these planning areas. The RMPs designate utility corridors, as well as identify additional miles of planning corridors. The RMPs contain 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.

Certain segments of the route alternatives would be located adjacent to existing transmission lines, including Segment A and much of Segments B, I, and J. Segments I and J are the only ones that would be within a BLM designated utility corridor (i.e., as shown in the Egan RMP [BLM 1984b]). Thus,

amendments to the RMPs would be needed to designate a new utility corridor along the Falcon to Gonder transmission line. The Shoshone-Eureka RMP would also be amended to eliminate the Highway 305 planning corridor and the Elko RMP would be amended to modify a decision regarding the Low Visibility Corridor along the I-80 highway. Chapter 5 provides further analysis of the environmental and land use implications of the RMP amendments.

County Land Use Plans and Policies

All of the route alternatives would traverse small amounts of private land administered by Eureka, Lander, and White Pine counties. However, the project would traverse no private lands within Elko County. The applicable county plans primarily contain goals and policies that address the urbanized portions of the counties, and contain only general directives related to utilities or utility corridors. The Eureka County Master Plan recommends that utility improvements be consistent with proposed land use patterns. Since the project would not deliver power specifically to Eureka County, except to the existing Falcon substation located in the rural, northern portion of the county, and does not include new local distribution lines, there would be little or no effect to existing land use patterns in the county.

The Lander County Master Plan has no land use policies related specifically to utilities or utility corridors, although Policy P4-9 encourages buffer zones between major industrial, commercial, and residential areas, as well as the protection of agricultural lands. Although it is unlikely that the project would be considered a major industrial use, the 160-foot project ROW would provide a buffer zone between this use and any residential or other uses that may exist along Segment B, the only portion of the project within Lander 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 (Goal 4.0). The proposed project is a 345 kV regional transmission line with little or no effect on local infrastructure.

Segments A and J are common to all route alternatives. The following discussion below provides further information related to land use and access in these areas.

Segment A

Approximately 82% of the land within the Segment A study area is privately owned and 18% publicly owned. Within the ROW of Segment A, there are 12 privately owned parcels held by 6 landowners (see Table 3.13-3). One of these parcels is developed with a mobile home, a fixed residence, and a mining area (these range from 820 to 1,800 feet from the centerline). The proposed transmission line would parallel two existing transmission lines (120 kV and 69kV) for the entire length of Segment A, approximately 250 to 325 feet apart from the nearest line. Impacts and mitigation measures related to land use and access along Segment A would be essentially the same as those previously discussed.

Segment J

Along Segment J, the proposed transmission line would run parallel to and north of SPPC's existing 230 kV transmission line; the distance from the existing line would vary between 300 and 1,100 feet apart. Approximately 96% of the land within the Segment J study area is publicly owned and 4% is privately owned. Most residences near Segment J are in the Cross Timbers subdivision. Of these units, 4 houses and 8 mobile homes would be located within 1,000 feet from Segment J. Segment J would be located approximately 500 feet from the nearest housing unit in this subdivision (APN 005-581-01). The existing 230 kV transmission line is located 200 feet from this parcel. One vacant parcel of the subdivision is currently traversed by the existing 230 kV line and would be approximately 80 feet away from the proposed transmission line (APN 101-270-10).

While future development may occur on this and other vacant lots in the Cross Timbers subdivision[2], residential growth in this portion of the county is slow, and there are no other future residential or commercial developments planned for this area (personal communication with Richard Foreman, White Pine County Consulting Engineer and Surveyor, June 8, 2000). Future development, if any, in the vicinity of Segment J would be set back at least 500 feet from the line. For these reasons, future development would not be significantly affected by Segment J.

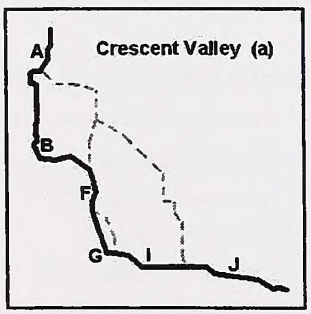
There are two privately owned and occupied residences relatively near the Gonder substation. One is 750 feet north of the substation, and is owned by SPPC (APN 10-320-04). The other occupied residence is located 1,850 feet south of the substation and is owned by a private individual (APN 10-330-01)[3]. As neither the transmission line nor the substation improvements would traverse or restrict access to these properties, there would be no substantial adverse impact to land use or access in this area.

North of Ely, Segment J would cross the northern edge of one undeveloped BLM land use authorization: the White Pine County Airport Lease for Yellend Field. The authorization is approximately 520 acres in size, and is located in Township 17 North, Range 63 East, and Section 13. Segment J would be located approximately 2.2 miles north of Yellend Field, which is operated by the White Pine County Airport Authority. The Airport Authority is in the process of considering lengthening the north-south runway from the current 6,000 feet to 10,000 feet to accommodate larger jets. This expansion may change the approach glide slope in the Instrument Landing System (ILS) for the air traffic approaching Ely from the north. The proposed transmission line along Segment J would not affect the White Pine County Airport ILS glidepath, as the new line would be 2.2 miles north of the airport and also would be placed on the north side of SPPC's existing 230 kV line. The design of the transmission line near the airport will be reviewed and approved by the Federal Aviation Administration.

Alternative-Specific Impacts

The following discussion provides further information about the potential impacts to land use and access by route alternative. Because each of the route alternatives differ by one or more segments, the potential impacts that are alternative-specific are best discussed in terms of their differentiating segments.

Crescent Valley (a) Route Alternative



The Crescent Valley (a) route alternative is comprised of Segments A, B, F, G, I, and J. In addition to the impacts common to all route alternatives discussed above, specific impacts for the Crescent Valley (a) route alternatives are listed below by their general location (segment).

Segment B

Along Segment B, there are 32 privately owned parcels within the proposed transmission line right-of-way. Two of these parcels contain 6 mobile homes (i.e., 3 single-wide trailers and 3 travel trailers). These trailers are approximately 60 feet to 170 feet from the project centerline. If one of the Crescent Valley route alternatives is selected, SPPC would coordinate with property owners during the right-of-way acquisition process to discuss the need to move the trailers out of the right-of-way (refer to previous Mitigation Measure Land Use-1), thus mitigating this impact to a less-than-significant level.

[2] The Cross Timbers subdivision is approximately 20% built-out, with the remaining lots vacant (personal communication with Richard Foreman, White Pine County Consulting Engineer and Surveyor, June 8, 2000).
[3] Letter dated May 22, 2000 from John Berdrow, SPPC, to EDAW, re: Gonder Substation Properties.

Segment B would also be about 0.5 mile to the east of the Cortez Gold Mine. Segment B would be routed to avoid the current Cortez mining operations. Segment B could, however, conflict with expansion plans for the Cortez mining operation, as discussed in Section 3.1, Geology and Minerals. SPPC would coordinate with Cortez Gold Mine's operating company to resolve potential conflicts as described previously. The new transmission line along Segment B would parallel an existing transmission line for approximately 38 miles. The distance of separation between the existing line and the new line would be 220 feet for most of the length.

K and L re-routes (along Segment B)

The K and L re-routes were identified as possible ways to avoid sensitive resources along Segment B. The L re-route would be located on public and private lands. The only development within 1.5 miles from the centerline of the L re-route is an industrial mining operation and a related equipment yard (approximately 1 mile and 0.5 mile away, respectively). The K re-route would be located on public lands with no residential, commercial, industrial, or public land uses near it. For these reasons, the L and K re-routes would have no discernable effect on land use.

Segment F

Segment F would not conflict with any existing developments, as there are no known buildings or facilities within 1,000 feet of the proposed centerline.

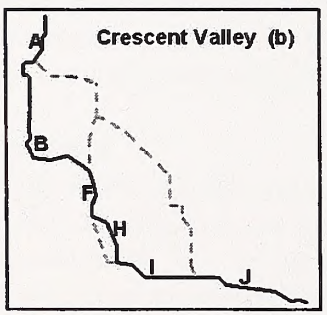
Segment G

In the Segment G study area, the only development includes 2 residential units (2 ranch houses with 3 outbuildings) and 1 active gravel pit (see Table 3.13-4). The transmission line would be approximately 1,300 feet away from the residential uses. None of these uses would be within 1,000 feet of the project.

Segment I

Segment I would parallel existing transmission lines for its entire length, including SPPC's 230 kV line and a 69 kV line between 250 feet and 1,200 feet away. The only developments within 1,000 feet from the centerline of Segment I are 2 fixed homes, 1 mobile home, and an active gravel pit. One ranch house approximately 450 feet away from the centerline. Segment I would be located approximately 2.2 miles north of the Town of Eureka.

Crescent Valley (b) Route Alternative

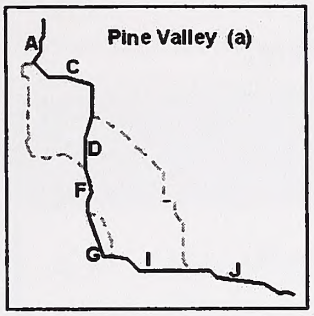


The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a nearly identical alignment with the Crescent Valley (a) route, except that it uses Segment H rather than Segment G, traversing the east side of Whistler Mountain rather than the west. The Crescent Valley (b) route shares the same potential impacts to land use and access associated with Crescent Valley (a) route, except it would avoid the Segment G impacts described above. The potential land use and access impacts associated with Segment H are described below.

Segment H

Developments within 1,000 feet of the centerline of Segment H include 2 fixed homes, 1 mobile home, and one commercial agricultural shop for a ranching operation. However, none of these are within the proposed right-of-way.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B. In addition to the potential impacts common to all route alternatives described previously, the Pine Valley (a) route would involve potential impacts to land use and access along Segments C and D, as described below.

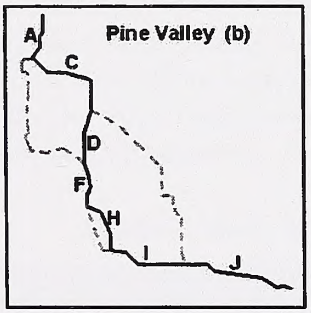
Segment C

The nearest residential unit along Segment C would be approximately 1,900 feet away from the centerline. There are no buildings in the proposed right-of-way. There are 2 active mining claims in the Segment C study area — one within or adjacent to the right-of-way and one outside of the right-of-way (see Table 3.13-5). Potential conflicts with mineral development would be addressed as explained previously in this section under "Potential Impacts to Mining" and in Section 3.1 Geology and Minerals.

Segment D

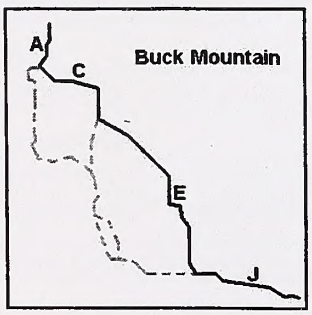
There are no known developments within 1,000 feet of Segment D. There is one mining claim within or adjacent to the proposed right-of-way.

Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west. The Pine Valley (b) route alternative would have largely the same potential impacts as Pine Valley (a) route. This route alternative would avoid any potential impacts associated with Segment G, and shift them to Segment H, described previously.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. It shares the potential impacts common to all route alternatives. Buck Mountain is the only route that uses Segment E, which is one of the most sparsely developed areas in the entire project area, as described below.

Segment E

Along Segment E, there are 3 ranch houses and 4 outbuildings, which are part of Warm Spring Ranch, and would be approximately 1,300 feet away from the transmission line. The transmission line would not adversely affect the private land uses in this area or restrict access to the property. There are seven mining claims within or adjacent to the proposed right-of-way and 11 outside of the right-of-way.

Summary Comparison of Route Alternatives

TABLE 3.13-8: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Land Use-1: Right-of-way Acquisition and Potential Loss of Property Value	X	X	X	X	X

RESIDUAL IMPACTS

The existence of the transmission line, right-of-way grant from BLM, and right-of-way easements on private properties would restrict other uses in the right-of-way, and potentially, on lands adjacent to the right-of-way. However, mitigation measures are expected to reduce this residual impact to a less-than-significant level.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to land use and access associated with this project would not occur. However, land use and access impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

3.14 RECREATION/WILDERNESS

This section describes recreational opportunities in the project area and provides a discussion of the relevant recreation plans and policies. The federal, state, county, and private recreational opportunities within 50 miles of the project area are shown in Figure 3.14-1. Wilderness Areas and Wilderness Study Areas (WSAs) in the project area are also shown in Figure 3.14-1.

3.14.1 ANALYSIS AREA AND METHODOLOGY

The analysis area for recreation/wilderness resources includes all federal, state, local, and private recreational areas within 50 miles of the project route alternatives. This includes recreational opportunities on federal lands managed by the BLM, USFS (including WSAs), and the USFWS. This analysis included a review of available existing recreation information in the project area, including information from the BLM Elko, Ely, and Battle Mountain Field Offices.

3.14.2 AFFECTED ENVIRONMENT

RECREATIONAL OPPORTUNITIES ON FEDERAL LANDS

Bureau of Land Management

The BLM provides a wide variety of dispersed outdoor recreational opportunities within the study area including fishing, hunting, camping, picnicking, hiking, river floating, and wildlife and wild horse viewing. Other activities include photography, nature study, rock climbing, mountain biking, horseback riding, cross-country skiing, snowmobiling, motorcycle, off-road vehicle (ORV) riding, and scenic driving. The BLM also offers a number of developed recreational sites within the project area. Table 3.14-1 identifies the developed recreational areas managed by the three BLM Field Offices within 50 miles of the route alternative segments. Developed recreational areas are described below.

TABLE 3.14-1: DEVELOPED BLM RECREATION SITES WITHIN 50 MILES OF THE PROJECT

Recreational Areas	BLM Field Office	Recreational Opportunities	Annual Visitation*	Approximate Size (acres)
Hickison Petroglyph Recreation Area	Battle Mountain	Geological sightseeing, camping, mountain biking	9,000	160
Mill Creek Recreation Area	Battle Mountain	Geological sightseeing, hiking, mountain biking, and camping	12,250	40
Illipah Reservoir	Ely	Boating/rafting, hiking, camping	41,000	200
Garnet Hill	Ely	Fishing, wildlife observation, hiking, mineral collecting	10,200	1,280
Cleve Creek Campground	Ely	Fishing, hiking, mountain biking, camping, and cross-country skiing	4,000	40
Egan Crest Trailhead	Ely	Hiking, picnicking	N/A	N/A
Zunino Reservoir	Elko	Wildlife observation, hiking, camping, fishing, boating, picnicking	9,000	200

**Visitation figures were provided by Jack Tribble, BLM Ely Field Office, 11/2/00, and Julia Wingard, BLM Elko Field Office, 11/3/00. Visitation figures for the Battle Mountain Field Office were also gathered from the Recreation Management Information System at http://rmis.azso.az.blm.gov/scripts/webobjects.exe/Rmis3-o.woa. No figures for the Egan Crest Trailhead are available, as this site has not yet opened to the public (opening Spring 2001).*
Source: (BLM 1999)

Hickison Petroglyph Recreation Area

Recreational opportunities at the Hickison Petroglyph Recreation Area include viewing prehistoric petroglyphs in the sandstone rocks. Hiking, historic points of interest, and wildlife viewing opportunities are also available. Other facilities include a day use area with 16 campsites, fire rings/barbecues, restrooms, and recreational vehicle (RV) parking. The recreation area is accessed from Highway 50, approximately 27 miles west of Eureka.

Mill Creek Recreation Area

Mill Creek was the site of a 1930s Civilian Conservation Corps work camp. The recreational area is located 20 miles south of Battle Mountain on State Route (SR) 305. Recreational opportunities at Mill Creek include camping, fishing, mountain biking, wildlife viewing, hiking, and geological sightseeing. The campground offers 11 tent sites, picnic tables, fire rings, and accessible vault-type restrooms. Recreational vehicle sites are also available.

Illipah Reservoir

Illipah Reservoir is a 200-acre reservoir at the base of the White Pine Mountain Range, approximately 37 miles west of Ely via Highway 50. Trout fishing, boating, hiking, and camping are popular activities at this site.

Garnet Hill

Garnet Hill is located at the 7,000-foot elevation Garnet Hill approximately 9.5 miles north of Ely via Highway 50. This recreation area provides picnicking opportunities, as well as rock collecting activities at the Garnet Rockhounding Area (BLM 1994).

Cleve Creek Campground

Fishing, hiking, mountain biking, and cross-country skiing are available at the Cleve Creek Campground, approximately 10 miles northeast of Ely. Camping and a group barbecue area are available at the Cleve Creek Campground.

Egan Crest Trailhead

The newly developed Egan Crest Trailhead has two picnic tables, two grills, a graveled parking lot, an informational kiosk, and a developed trail system. The trailhead is accessed on the north side of Hwy 50, approximately 8 miles west of Ely. The trail system has three loops, heads in a northerly direction from the trail head, and will be open in spring 2001 (personal communication, Jack Tribble, BLM Ely Field Office, November 6, 2000).

Zunino Reservoir

Zunino Reservoir is located immediately east of the Ruby Mountains and 30 miles south-southeast of Elko via SR 227 and SR 228. Opportunities for open camping are located on the north and south shores. Other recreational opportunities include fishing, boating, picnicking, hiking, and wildlife observation.

USDA Forest Service

The Humboldt-Toiyabe National Forest provides recreation opportunities in the analysis area. The USFS also manages designated Wilderness Areas and Wilderness Study Areas.

Humboldt National Forest

The Humboldt National Forest is part of the Humboldt-Toiyabe National Forest. This 2.5-million-acre National Forest is composed of nine separate divisions and is the largest National Forest outside of Alaska. Recreational opportunities include hiking, camping, hunting, wildlife viewing, fishing, snowmobiling, cross-country skiing, helicopter skiing, and other activities. The Forest has 20 developed camp and picnic grounds, as well as 900 miles of trails for backpacking and hiking (USFS 2000).

Sierra Pacific Power Co.

FALCON to GONDER Project

Developed Recreation Sites

Facility Management / Ownership

- BLM
- State
- Private
- US Forest Service Facility
- US National Forest
- Designated Wilderness Area
- Wilderness Study Area

National Historic Trails

- Pony Express
- California Trail

Route Alternatives

Scale 1 : 950,400
(33 % reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 15 miles

GIS Mapping by **EDAW, Inc.** — San Francisco 04/25/01

SOURCES: EDAW, Inc. (2000) / US Bureau of Land Management / Nevada —Bureau of Mines & Geology GIS / USGS —DEM

Figure 3.14-1

Portions of the project would be located near, but outside of, two divisions of the Humboldt National Forest. One part of the forest within the Ruby Mountains is located approximately 2 miles from the project. This area is primarily accessed from Highway 228. Another division of the forest is located approximately 4 miles east of Ely. This portion of the forest is accessed primarily by Highways 50 and 93.

Toiyabe National Forest

The Toiyabe National Forest is part of the combined Humboldt-Toiyabe National Forest. The Forest offers a variety of recreational opportunities, including camping, hiking, fishing, hunting, skiing, canoeing, horseback riding, and sightseeing. There are 35 developed public campgrounds on the Forest, with a total of approximately 900 family and group sites. Other developed recreational opportunities include 8 picnic grounds, observation sites, trailheads, snow play areas, cross-country skiing, and 2 ski resorts (USFS 2000). The Toiyabe provides over 1,100 miles of trails for hiking, backpacking, and horseback riding. The Forest also offers over 1,600 miles of recreation roads for travel and viewing scenery. Some of the many trails crossing the Toiyabe include the Pacific Crest National Recreational Scenic Trail, the Toiyabe Crest Trail, Mount Charleston National Recreational Trails, and the soon to be completed Tahoe Rim Trail (USFS 2000). The nearest section of the Toiyabe National Forest to the project area is located approximately 24 miles southeast of the town of Eureka, accessed primarily by Highway 50.

Designated Wilderness Areas

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 areas are defined as areas where "....the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." A Wilderness Area 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." Designated Wilderness Areas in the project area are all within the Humboldt-Toiyabe National Forest and include the following:

- Ruby Mountains Wilderness (Elko County) 90,000 acres
- East Humboldt Wilderness (Elko County) 36,900 acres
- Jarbidge Wilderness Additions (Elko County) 48,500 acres
- Mount Moriah Wilderness (White Pine County) 82,000 acres
- Currant Mountain Wilderness (White Pine, Nye Counties) 36,000 acres
- Quinn Canyon Wilderness (Nye County) 27,000 acres

A portion of the project would be located approximately 28 miles southwest of the Ruby Mountain Wilderness Area and approximately 30 miles from the Currant Mountain Wilderness Area.

Wilderness Study Areas

A WSA is a unit of BLM-administered land whose characteristics meet criteria set forth by Congress for wilderness. Some of these characteristics would include a size greater than 5,000 acres, free from man-made improvements such as roads, and offering outstanding opportunities for solitude and primitive recreation. The BLM's Interim Management Policy for Lands Under Wilderness Review guides management and decisions for specific areas of public lands under wilderness review by Congress. The policy applies to the following:

- Wilderness study areas (WSAs) identified by the wilderness review required by Section 603 of the Federal Land Policy and Management Act (FLMPA);
- WSAs established by Congress; and

- WSAs identifies through the land use and planning process in Section 202 of the FLPMA.

The purpose of the policy is to prevent impairment of wilderness values of WSAs under the BLM's jurisdiction until such time Congress either designates the area as wilderness, or releases it from the wilderness review process through legislation. Congress has recommended a number of WSAs in Nevada for consideration. Each of these areas is roadless, natural in condition, and possesses outstanding opportunities for solitude or primitive unconfined recreation. There are four WSAs within 50 miles of the project area. These WSAs include the following:

- **Roberts Mountain WSA** is located approximately 40 miles northeast of the town of Eureka and approximately 6 miles west from the closest route alternative segment. The WSA consists of 15,090 acres of the rugged Roberts Mountains and its three prominent peaks. Vegetation in this WSA includes willow, cottonwood, aspen, birch, and dogwood trees in deep, narrow canyons. Mountain mahogany trees and limber pine are found in isolated stands on the barren rock ridges.
- **Simpson Park WSA** is located within the Simpson Park mountain range on the Eureka/Lander County border. This WSA is approximately 49,670 acres in size and located approximately 17 miles from the closest route alternative segment. This area offers a variety of wildlife, vegetation, and topography, with three mountain peaks.
- **Red Springs WSA** is located east of the northernmost section of the Humboldt National Forest in Elko County. This WSA is approximately 7,847 acres in size and located approximately 20 miles from the closest route alternative segment. The core of this WSA is an east-tilted block of limestone. The remainder of the area is comprised of sedimentary rocks forming rounded weathered hills and eroded drainages.
- **Cedar Ridge WSA** is located just south of the Red Springs WSA in Elko County. This WSA is approximately 10,000 acres in size and located approximately 15 miles from the closest route alternative segment. This WSA is a densely covered ridge of pinyon pine-juniper, with Hilton Peak as its highest point.

U.S. Fish and Wildlife Service

Ruby Lake National Wildlife Refuge

The Ruby Lake National Wildlife Refuge (NWR) was established by the USFWS in 1939, and lies to the east of the Humboldt National Forest in the southern end of Ruby Valley. It is located approximately 65 miles southeast of Elko and 8 miles northeast from the nearest route alternative segment. The refuge consists of approximately 17,000 acres of marsh and is bordered by meadows, grasslands, seasonal alkali wetlands, and shrub-steppe uplands. The marsh is remnant of an ancient, 200-foot-deep lake and is supplied with water from over 150 springs emerging from the base of the Ruby Mountains. Over 200 bird species, including 25 species of waterfowl, use the refuge during migration and for nesting and feeding. Recreational opportunities at Ruby Lake NWR include kayaking, fishing, waterfowl hunting, bird watching, and nature viewing. Campgrounds and a visitor's center are also available at the South Ruby Campground. Public use has been as high as 70,000 visitors per year, most of which were anglers (Audubon 2000).

National Historic Trails

California and Pony Express National Historic Trails

The California National Historic Trail and Pony Express National Historic Trail were established as National Historic Trails by Congress in 1992. Nearly 200,000 Americans traversed the California National Historic Trail between 1841 and 1860 to settle in California and establish farms or seek gold during the Gold Rush. Approximately 1,136 miles of trails exist in Nevada alone. The Pony Express National Historic Trail was established in 1860 to transport mail from Missouri to California and

demonstrated the viability of an overland mail route to the west. Approximately 400 miles of this trail lie within Nevada. Both trails symbolize American's rapid expansion to the Pacific (NPS 1999). The California National Historic Trail runs through the project area near the southern base of the Ruby Mountains Division of the Humboldt National Forest, and roughly parallels Interstate 80 through the BLM Elko District in the project area. The Pony Express National Historic Trail runs roughly east-west through the BLM Battle Mountain and Ely Districts in the project area. The trails are administered by the Long Distance Trails Office of the National Park Service in Salt Lake City, Utah, but responsibility for the management of the trails lies in the hands of current trail managers at the federal, state, local, and private levels. The California National Historic Trail is located on a patchwork of private and BLM-managed lands in the project area, while the Pony Express Trail is located almost entirely on BLM-managed lands in the project area.

Recreational use of the trails include hiking, biking, horseback riding, and historic reenactments of the trail experience. Usage of the trails is increasing due to heritage tourism (i.e., people rediscovering their past), commemorative activities, and media interest (NPS 1999). Each June, as many as 600 members of the National Pony Express Association reenact the historic ride (GORP 2000). Others reenact the westward trek along the California Trail by covered wagon and on foot.

RECREATIONAL OPPORTUNITIES ON STATE LANDS

Cave Lake State Park

Cave Lake State Park is located approximately 15 miles southeast of Ely via Highway 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 are also available. Weather permitting, Cave Lake is open all year (NSP 2000).

Ward Charcoal Ovens State Historic Park

Ward Charcoal Ovens State Historic Park is located approximately 18 miles south of Ely via Highways 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 the Steptoe Valley and surrounding mountains.

South Fork State Recreational Area

South Fork State Recreational Area, also known as South Fork Reservoir, is located approximately 16 miles south of Elko on State Route 228. The reservoir covers 1,650 acres and is surrounded by 2,200 acres of meadowlands and rolling hills. It is popular for hunting, camping, boating, picnicking, winter sports, and wildlife viewing. The reservoir is best known for its trophy-class trout and bass fishery. Facilities include a boat launch, campground, trailer dump, station, and picnic area (NSP 2000).

RECREATIONAL OPPORTUNITIES ON COUNTY LANDS

Eureka County

Recreational opportunities owned and operated by Eureka County are primarily located in the Town of Eureka. These include the Eureka County Rodeo Grounds and Fair Building, a community indoor swimming pool, two ball fields, and a small county park in the center of town. The Eureka County School District maintains an indoor gymnasium, a running track, and a football field complex in the Town of Eureka. The Town of Crescent Valley, in the northern portion of the county, also offers a

rodeo arena and a town park (Eureka County 1997). None of these community recreation facilities are located near the route alternatives.

White Pine County

Recreational opportunities owned and operated by White Pine County include a golf course, tennis courts, numerous ball parks, six town parks, neighborhood parks, a shooting range, and playgrounds (White Pine County 1998). These facilities are located in the City of Ely and the town of McGill. The county also operates the White Pine County Rodeo Grounds and Fairgrounds facility north of the City of Ely. Additionally, the City of Ely owns and operates the Ghost Train. Other recreational opportunities within White Pine County are similar to those within the BLM Ely Field Office due to the overlap of BLM and county land in this area. The varied outdoor recreational opportunities include camping, hiking, fishing, backpacking, horseback riding, ATVs, mountain biking, cross-country skiing, snowmobiling, nature photography, wildlife viewing, and hunting.

Lander County

In Lander County, the primary recreational opportunities are concentrated in the communities of Austin, Battle Mountain, and Kingston. No community recreation facilities are near the route alternatives. The main recreational opportunities outside of these communities are primarily dispersed outdoor recreational activities, such as hunting, hiking, fishing, camping, and ORV use similar to those available within the BLM Battle Mountain Field Office due to the overlap in these areas.

Elko County

Similar to the other counties in the region, the primary recreational opportunities in Elko County are concentrated in the urbanized areas of Elko, Wells, and Carlin. The Elko County parks and recreation sites identified in the Elko County Master Plan (1996) include the Lamoille Canyon Camp Ground, the Wildhorse Reservoir, the "Snow Bowl," and the Elko County Fairgrounds. None of these recreational facilities are located near the route alternatives. Recreational opportunities in the rural portions of Elko County include hunting, fishing, camping, sightseeing, and rock collecting (Elko County 1996).

PRIVATE RECREATIONAL OPPORTUNITIES

The only private recreational facility near the project area is located near the City of Ely. A privately run KOA Campground is located 3 miles south of the City on State Route 6/50/93. The KOA Campground offers year-round camping on numerous grass tent sites and RV parking areas (KOA 2000).

RECREATION MANAGEMENT PLANS AND POLICIES

A number of land management plans and policies exist within the project area. These include BLM Resource Management Plans, the Statewide Comprehensive Outdoor Recreation Plan (SCORP), and county master and/or land use plans. These plans and policies as they relate to recreation opportunities and WSAs are described further below.

BLM Resource Management Plans

Three field offices of the BLM manage various resource topics within the project area. The Elko Field Office of the BLM manages the Elko resource area, the Battle Mountain Field Office manages the Shoshone-Eureka resource area, and the Ely Field Office manages the Egan resource area. The RMPs for each of these areas contain a number of planning objectives and management actions related to recreation and WSAs.

Shoshone-Eureka RMP

The Shoshone-Eureka Resource Area contains 4.4 million acres of public land in north-central Nevada administered by the Battle Mountain District BLM (BLM 1984a) and encompasses most of Lander and Eureka counties and a portion of Nye County. The RMP provides land use and management objectives related to recreation and wilderness designations. A summary of these is provided below.

Recreation Designation

- Develop the recreational potential of the public lands to a level sufficient to meet the growing demands of recreationists using public lands.
- Encourage recreation use on public lands.
- Ensure protection of the environment and aesthetic qualities within the resource area.
- Improve the opportunities for recreational uses of wildlife and wild horses.

Wilderness Designation

- Recommend wilderness designation for those WSAs where the values of wilderness designation are capable of balancing the other resource values and uses, which would be foregone due to wilderness designation.
- Recommend wilderness designation only for those WSAs that can be effectively managed as wilderness over the long term.

Elko Resource Area RMP

The Elko District RMP is a long-range plan to manage public lands within the Elko Planning Area of north-central Nevada (BLM 1986). The Elko Resource Area consists of three planning units, the North Fork, Buckhorn, and Tuscarora, consisting of approximately 5.9 million acres in the western half of Elko County and northern portion of Lander and Eureka counties. Over 3.1 million acres are public lands administered by the BLM. The RMP provides land use management objectives related to recreation, as summarized below.

- Provide for a wide range of recreation opportunities by maintaining the three existing Special Recreation Management Areas (SRMAs) in the planning area, designating the South Fork of the Humboldt River as an area for water-based recreation uses, designating the Wildhorse SRMA for camping and water-based recreation, and managing the remainder of the planning area for dispersed recreation activities, including ORV use.
- Manage as wilderness those portions of the WSAs that are manageable as wilderness and where wilderness values are capable of balancing other resource values and uses that would be foregone. The RMP contains two management actions related to WSAs: (1) recommend the Rough Hills WSA (6,685 acres) and a portion of the Little Humboldt River (29,775 acres) as preliminary land suitable for wilderness designation; and (2) recommend the Cedar Ridge and Red Springs WSAs and a portion of the Little Humboldt River WSA, totaling 30,294 acres, as non-suitable for wilderness designation.

Egan Resource Area RMP

The Egan RMP is a 20-year plan to manage 3.8 million acres of public land in east-central Nevada, managed by the Ely District of the BLM (BLM 1984b). The majority of the resource area is located in White Pine County, although portions are also located in Nye and Lincoln counties. The RMP focuses on three resource issues: rangeland management, realty actions, and WSAs, but does not contain guidelines related to recreation. A summary of the management objectives for WSAs is provided below.

- Recommend portions of three WSAs as suitable for possible wilderness designation, including Goshute Canyon, Park Range, Riordan's Well, and South Egan Range.
- Designate portions of Riordan's Well and South Egan Range WSAs as "limited" to ORVs. The remainder of the resource area would be designated "open."
- Continue to protect all Wilderness Areas under the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review, until recommended by Congress to become a National Wilderness Area.

National Park Service Historic Trails Management Plan

The Long Distance Trail Office of the National Park Service completed a Comprehensive Management and Use Plan and Final EIS in 1999 for the California National Historic Trail and the Pony Express National Historic Trail. The document focuses on the trails' purpose and significance, issues, and concerns related to current conditions along the trails, 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 (either) 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." 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" (NPS 1999). In the project area, the NPS identifies the Gravelly Ford site of the California National Historic Trail as a high-potential site, and the Overland Canyon to Simpson Park Station segment of the Pony Express National Historic Trail as a high-potential segment.

State Plans and Policies

The Statewide Comprehensive Outdoor Recreation Plan (SCORP), prepared by the Nevada Division of State Parks in 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, including the following in the project area:

- Mill Creek (BLM)
- Zunino Reservoir (BLM)
- Cold Creek Reservoir (BLM)
- Garnet Hill (BLM)
- Hickson Petroglyph (BLM)
- Ward Mountain (USFS)

According to the plan, the outdoor recreational activity with the highest actual participation rate in Nevada (90% of a telephone survey respondents) was defined as "relaxing outdoors." Hiking, walking, picnicking, and pleasure driving were also popular, with about 75% of all respondents participating in these activities (Nevada Division of State Parks 1992).

Areas with high potential for recreational use were also identified. The plan identifies various dispersed areas in the project area with high potential for tent camping, ORV and motorcycle riding, and picnicking/vehicle camping. For example, the southeastern edge of the Humboldt National Forest and the base of Buck Mountain are identified as areas with essential characteristics for tent camping. These characteristics include slopes less than 25%, forest cover, water features, wildlife, moderate temperatures, and suitable soils. This area is in the vicinity of one of the route alternative segments.

The SCORP also identifies future recreation issues and actions for the state as a whole. One of the issues applicable to the 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 which 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. Areas of specific concern within the project area include the Ruby Mountains and the East Humboldt Range. The actions to address this issue include: (1) land exchanges, easements, rights-of-way, purchases, or cooperative agreements; and (2) acquisition of ROWs to public lands that are blocked by private lands and of inholdings to solidify public land parcels.

A final applicable issue identified in the plan 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, and (2) encourage area-wide trail planning to develop master trail systems and connectors.

County Plans and Policies

Eureka County Master Plan (1997)
The Eureka County Master Plan provides general recommendations related to parks and recreation in Eureka County. The county recommends that they determine the number of acres of park land, estimate how often parks are used and by how many people, and determine further needs based on the level of service standard of 100 acres per 1,000 people.

White Pine County Land Use Plan (1998)
The White Pine County Land Use Plan encourages development of county-wide recreation areas and support activities by participating in county-wide youth programs and activities, enhancing and preserving existing recreational facilities, and supporting new recreation facilities in the county. The White Pine County Public Land Use Plan, a coordinated land use planning effort among the county, the BLM, and the USFS, encourages dispersed recreational opportunities.

Lander County Master Plan (1997a)
The goals for recreation in Lander County are: (1) to provide adequate recreational facilities for the residents of Lander County; and (2) to develop, maintain, and improve access to outdoor recreational resources.

Elko County Master Plan (1996)
Goals for recreation in Elko County include identifying, prioritizing, reserving, acquiring, developing, and maintaining a system of recreation areas and programs. Recreation policies include developing and enhancing park use for all age groups, supporting development of new specialty facilities at the Elko County Fairgrounds, and providing accessible recreation opportunities for the disabled.

Statewide Visitation Trends

Visitation of developed and dispersed recreational sites in Nevada, including those in the project area, has been steadily increasing over the past 15 years. Visitation will likely continue to increase proportionately with the growing statewide population (personal communication, Jack Tribble, Recreation Specialist, BLM Ely Field Office, November 2, 2000).

3.14.3 ENVIRONMENTAL CONSEQUENCES

This section describes the effects of the Falcon to Gonder project on recreation and wilderness resources.

SIGNIFICANCE CRITERIA

The project would be considered to have a significant adverse impact to recreational resources and wilderness if it would:

- Directly disturb federal, state, local, or private recreational sites;
- Restrict access to federal, state, local, or private recreational sites or restrict access to public land; or
- Substantially reduce the scenic values of undeveloped federal, state, local, or private recreational sites or wilderness areas or WSAs.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to all Route Alternatives

There are a number of potential effects to recreation/wilderness common to all route alternatives that could occur as a result of the project. These effects include: (1) potential recreational conflicts with construction-related truck traffic, (2) potential conflicts with recreational plans or policies, (3) potential effects of access roads on recreational resources, and (4) potentially restricted access and reduced visitation. None of these effects would have a substantial adverse effect to these resources, as described below.

Potential Conflicts with Construction-Related Truck Traffic

Construction-related truck traffic may have a temporary effect on local roadways by delaying access to recreational areas in the project area due to the slow-moving nature of trucks hauling materials to construction sites. This potential effect would be common to all route alternatives. 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 minor and not considered significant.

Potential Conflicts with Recreational Plans or Policies

The BLM recreation goals and policies as described in the three applicable RMPs are primarily related to WSAs or general enhancements to dispersed recreation on an area-wide basis. The project would avoid all WSAs, and no specific BLM recreational goals or policies are directed toward the areas proposed for the route alternatives. Therefore, the project would not conflict with BLM recreational plans or policies.

Recreational goals and policies contained in the four counties' land use or master plans 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 directed toward the areas proposed for the transmission line routes. As the project would largely avoid populated areas, there would be no conflict between the project and county recreation plans and policies.

Access Road Impacts

As part of the project, many miles of existing dirt roads would be improved for enhanced access, and a few new spur roads would be constructed. These improved or new roads leading from state highways to the project area may increase accessibility into areas that were previously inaccessible. Currently impassable two-track dirt roads may be accessible by 2- or 4-wheel drive (4WD) vehicles. Since the these access road improvements would primarily occur on federal lands and such activities as dispersed recreation and general sightseeing/nature viewing are allowed on federal lands in most locations, there would be no adverse effect to recreational resources. These access roads would not traverse or restrict access to existing developed recreation sites, as none exist in the immediate project area. Improved

access roads may have a slightly beneficial effect by providing increased opportunities for dispersed recreational 4WD use or general sight seeing.

Impacts to Recreational Access and Visitation

Project transmission lines would traverse a number of roadways, providing access to the developed and dispersed recreational resources in the project area. Visitation to these sites is largely dependent on automobile access via local highways. Since no alterations to local roads are anticipated as a result of the project and the transmission lines would span these routes allowing unrestricted access beneath them, the project would have little or no effect on recreational access or visitation rates. During transmission line stringing operations, it may be necessary to close some smaller, dirt roads for the duration of this activity. Some of these road closures may temporarily restrict access to dispersed recreational areas. These areas would likely be accessible via route alternatives, and the road closures would be temporary in nature. As a result, the project would not have a significant adverse effect on dispersed recreational resources.

Segment A

Segment A is common to all route alternatives and would be located approximately 25 miles east from Mill Creek at its nearest point, and would traverse Interstate 80. The Mill Creek Recreation Area is located 20 miles south of Battle Mountain on State Route 305, which is accessed via Interstate 80. Project transmission lines would span I-80, providing unrestricted access along this freeway. In addition, access to recreational areas along State Route 305 would not be impeded. As a result, Segment A would cause no substantial adverse effect to recreational access to the Mill Creek Recreation Area.

Segment A would cross a portion of the California National Historic Trail near the I-80 crossing but would not impede access for recreational users along the trail. Project archaeologists were unable to locate intact segments of the trail during the cultural resources inventory. The trail segment would not be considered historically significant due to the existing modern elements that have diminished the historic-visual context of this area. For these reasons, the project would not have a significant adverse visual effect on the recreational qualities of the trail. (See Section 3.16, Cultural Resources and Section 3.9, Visual Resources, for further detail.)

Segment J

A number of BLM recreational areas are located near (from 4.5 to 8 miles) Segment J, which is common to all route alternatives. These areas include: (1) Egan Crest Trailhead approximately 4.5 miles south of Segment J[1]; (2) Garnet Hill, approximately 5 miles south of Segment J near Ely; (3) Cleve Creek Campground, approximately 17 miles west of the Gonder substation; and (4) Illipah Reservoir, approximately 8 miles south of Segment J at the base of the White Pine Mountains. US Highways 50 and 93 are used to access these recreational areas. Segment J would span three highways and, therefore, would cross US Highway 50 twice and Interstate 93 once, but would not impede access to these recreation areas. Therefore, Segment J would not cause an adverse effect to recreational access of these recreational areas.

Also located approximately 4 miles to the east of the Gonder substation is the eastern section of the Humboldt National Forest. Dispersed recreational activities occur here, including hiking, camping, picnicking, wildlife viewing, and other activities. This area would be accessed from State Highway 486, via US Highway 50/93. Segment J would cross Highways 50 and 93; however, no changes to these routes are planned as part of the project. Segment J would therefore have no effect on recreational access to this area.

Segment J would be located approximately 30 miles north of the Currant Mountain Wilderness Area, within the Humboldt National Forest. Segment J would not be visible from the upper elevations of this

[1] The trail system, developed as part of the Egan Crest Trailhead, would end approximately 0.5 mile south of Segment J.

wilderness area due to the distance and the intervening mountains. For these reasons, Segment J would have no substantial adverse visual effect on the Currant Mountain Wilderness Area. This area is accessed by U.S. Highway 6 from Ely. Segment J would have no effect to U.S. Highway 6, and would therefore have no effect on recreational access to this designated wilderness area.

Two Nevada State Parks are located relatively near (12 to 21 miles) Segment J. These include: (1) Cave Lake State Park, approximately 12 miles southwest of the Gonder substation near Ely; and (2) The Ward Charcoal Ovens State Historic Park, approximately 21 miles southwest of the Gonder substation. Both of these areas are accessed via Highways 50/6/93. Segment J would cross Highways 50 and 93; however, no alterations or access restrictions to these roadways are anticipated as a result of this project. For these reasons, Segment J would have no substantial adverse effect on state recreational areas.

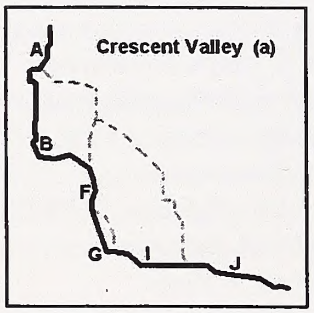
The only White Pine County recreational facility closest to Segment J is the County Fairgrounds, approximately 5 miles to the south of the Gonder substation. Due to the distance between the substation and the fairgrounds, there would be no effect to this county recreational resource.

Finally, Segment J would be located approximately 10 miles north from the privately run KOA Campground. There would be no discernable effects to this private recreation resource.

Alternative-Specific Impacts

None of the transmission line route alternatives would traverse BLM recreation areas, National Forest lands, designated Wilderness Areas or Wilderness Study Areas, or state or private recreation areas. As the route alternatives are differentiated by segment, this discussion of potential impacts by route alternative is presented below by segment. Some proposed transmission line segments would pass within 50 miles of a number of recreation areas, and would traverse roadways that provide access to these areas. These areas, and the project's potential effects to them, are described below by route alternative and segment.

Crescent Valley (a) Route Alternative



The Crescent Valley (a) route alternative is comprised of Segments A, B, F, G, I, and J. In addition to the impacts common to all route alternatives discussed above (including Segments A and J), specific impacts for the Crescent Valley (a) route alternative are described below.

Segment B

Segment B would be located approximately 22 miles east of the Mill Creek Recreation Area and would traverse State Route 305. Transmission towers would span this and other roadways, allowing unrestricted access to recreational opportunities. Since most users access Mill Creek from SR 305, Segment B would cause no substantial adverse effects to recreational access to the recreation area.

Segment F

A portion of Segment F would pass within 4 miles of the Roberts Mountain WSA[2]. This segment may be visible from the upper elevations of Roberts Mountain. The area between the WSA and Segment F has a BLM visual resources management (VRM) rating of Class III, which indicates that moderate changes to the characteristic landscape are acceptable. While this segment may have some degree of visual intrusion on the WSA, due to the relatively far distance of the project and the Class III rating of the area, the visual intrusion would be minor. As a result, Segment F would have no substantial adverse visual effect on the Roberts Mountain WSA. For additional information, please refer to Section 3.9, Visual Resources.

Segment G

Segment G would be located approximately 17 miles northeast of the Toiyabe National Forest. This forest is accessed primarily by Highway 50, which would be traversed by Segment G east of Eureka. Transmission lines would span Highway 50, providing unrestricted access along this highway. As a result, Segment G would cause no substantial adverse effect to recreational access to the Toiyabe National Forest.

Segment G would cross the historic Pony Express National Historic Trail near the southeastern base of the Roberts Mountains. 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 1999). The BLM, however, designates this location near the trail as a Class IV visual resource. The project would span the trail and would allow unrestricted recreational access along this segment of the trail. In addition, this area is heavily wooded, which would minimize the projects visual effects on the trail. For further information on this potential effect, please see Section 3.9,Visual Resources, and Section 3.17, Cultural Resources.

Segment G would also be located approximately 35 miles east of the BLM-managed Hickison Petroglyph Recreation Area. The recreation area is accessed from Highway 50, approximately 27 miles west of the town of Eureka. Segment G would traverse Highway 50 north of Eureka. Transmission lines would span Highway 50, providing unrestricted access along this roadway. Travel along this roadway would continue beneath the transmission lines, and access to recreational areas along Highway 50 would not be impeded. As a result, Segment G would cause no substantial adverse effect to recreational access to Hickison Petroglyph Recreation Area.

Finally, Segment G would be located approximately 17 miles from the Simpson Park WSAs. Due to the distance from this area, the project would have no discernable effects to this WSAs.

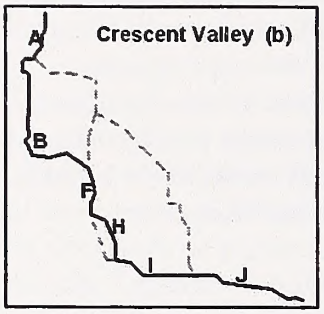
Segment I

No federal, state, local, or private recreational areas are located within or near the study area of Segment I.

In summary, there would be no significant recreation impacts associated with the Crescent Valley (a) route alternative.

[2] Other segments, including Segments B, D, G, and H, would also be within 50 miles from the Roberts Mountain WSA. However, these segments would be located at greater distances than Segment F, and would be even less visible, further reducing their potential effect on this WSA.

Crescent Valley (b) Route Alternative



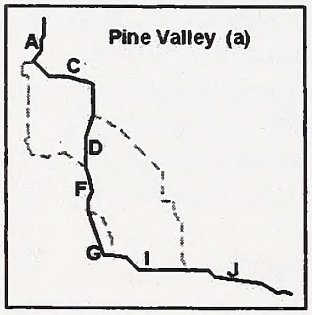
The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segment H instead of Segment G. Potential impacts to Segments A, B, F, I, and J are described above

Segment H

Segment H would also cross the Pony Express National Historic Trail. 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 1999). The BLM, however, designates this location near the trail as a Class IV visual resource. The project would span the trail and would allow unrestricted recreational access along this segment. However, the project would be clearly visible from the trail, diminishing its historic setting and feeling. For further information on this potential effect, please see Section 3.9,Visual Resources, and Section 3.17, Cultural Resources.

In summary, there would be no significant recreation impacts associated with the Crescent Valley (b) route alternative.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B. Potential impacts to Segments A, F, G, I, and J are described above.

Segment C

Segment C would be located approximately 25 miles west of the South Fork State Recreation Area (South Fork Reservoir). The segment would not cross any primary access routes to this reservoir. Due to the distance from this recreational resource, the project would have no discernable effects to this area.

Segment C would also be located approximately 6 miles south from the Gravelly Ford site of the California National Historic Trail, which the NPS identifies as a "high-potential site" for its historic/interpretive value. An historic marker currently marks this spot. Due to the distance from the project, however, there would be no substantial effect to the historic setting and feeling of this site.

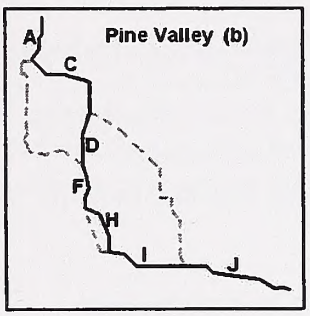
Finally, Segment C would be located approximately 20 miles and 15 miles, respectively, from the Red Springs and Cedar Ridge WSAs. Due to the distance from these areas, the project would have no discernable effects to these WSAs.

Segment D

No federal, state, local, or private recreational areas are located within or near the study area of Segment D.

In summary, there would be no significant recreation impacts associated with the Pine Valley (a) route alternative.

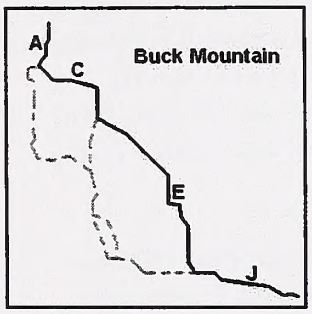
Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west.

As described above, there would be no significant recreation impacts associated with any of these segments.

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. As described above, there would be no significant recreation impacts associated with Segements A, C, or J; Segment E, unique to the Buck Mountain Alternative, is described below.

Segment E

The Zunino Reservoir is located immediately east of the Ruby Mountains and 30 miles south-southeast of Elko via SR 227 and SR 228. Segment E of the Buck Mountain route alternative would be located approximately 24 miles southwest of the Zunino Reservoir, and would traverse State Route 278. The transmission line would span this roadway, providing unrestricted access along this route. As a result, Segment E would have no substantial adverse impact to access to the Zunino Reservoir.

Segment E would also be located approximately 1.5 miles southeast of the Ruby Mountains Division of the Humboldt National Forest. Recreational users of the Ruby Mountains division access this area via State Route 46 from Eureka or State Highways 227 and 228 from Elko. Segment E would cross State Highway 46; however, transmission lines would span this roadway, providing unrestricted access along this route. Travel along State Route 46 would continue to occur beneath the transmission lines, and access to recreational areas would not be impeded. This route would have no substantial adverse impact to access to this portion of the Humboldt National Forest.

Portions of Segment E may be visible from certain areas of the Ruby Mountains Division of the Humboldt National Forest. However, at upper elevations within the forest and at a distance greater than 2 miles, the transmission lines would be nearly invisible against a backdrop of vegetation and would constitute no adverse effect. At the lowest elevations from within the forest at a distance of 2 miles, the transmission line and towers would be minimally visible against the sky. The existence of the transmission line would not substantially diminish the recreational experience from within Humboldt National Forest. As a result, Segment E would have no substantial adverse impact to this recreational area.

Segment E would be located approximately 28 miles southwest from the Ruby Mountains Wilderness Area, also located in the Humboldt National Forest. It is unlikely that Segment E would be visible at this distance, even from the upper elevations of this wilderness area due to the intervening mountains. For these reasons, Segment E would have no substantial adverse visual effect on the Ruby Mountains Wilderness Area.

Segment E would also be located approximately 9.5 miles southeast of the USFWS-managed Ruby Lake National Wildlife Refuge on the east of the Ruby Mountain portion of the Humboldt National Forest. Recreational users of the refuge would access this area via State Routes 46 and 227. As described above, no access restrictions to this roadway are anticipated as a result of the project. At 9.5 miles away, Segment E would be minimally visible, if at all, from the refuge. As a result, Segment E would have no substantial adverse impact to this recreational area.

Segment E would cross the Pony Express National Historic Trail near the southern base of the Ruby Mountain Division of the Humboldt National Forest. 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 1999). The project would span the trail but would not restrict recreational access along this segment of the trail. However, the project could visually intrude upon the trail and diminish its historic setting and feeling. In addition, the BLM has classified this stretch of the trail as a Class II visual resource. As a result, the project would have a significant unavoidable visual impact on the trail. For further information on this potential effect, please see Section 3.9,Visual Resources, and Section 3.16, Cultural Resources.

Segment E would also be located approximately 1 mile southwest of the California National Historic Trail near the southern base of the Ruby Mountains Division of the Humboldt National Forest, and would parallel the trail for approximately 8 miles. This area is not considered by the NPS as a high-potential segment, and the project would likely have a minor visual intrusion on this trail segment due to distance.

The SCORP identifies various dispersed areas in the project area with high potential for tent camping, ORV and motorcycle riding, and picnicking/vehicle camping. Specifically, the southeastern edge of the Humboldt National Forest at the base of Buck Mountain is identified as an area with essential characteristics for tent camping. It appears that Segment E of the Buck Mountain route alternative would traverse this area, potentially conflicting with the state's plans for future tent camping in this area. This area would likely be precluded from tent camping if a transmission line were present in the immediate vicinity. The state plan, however, also identifies a number of other areas in Nevada that would be similarly suited for additional tent camping, and there is no apparent weighting or priority given to any one are over another. For these reasons, the selection of Segment E of the Buck Mountain route alternative would not be considered a significant conflict with the state recreational plan.

Summary Comparison of Route Alternatives

As described above, Segments E and J would be proximate to the greatest number of recreational resources in the project area. Segment E is associated solely with the Buck Mountain route alternative, while Segment J is associated with all five route alternatives. The only significant adverse effects to recreation resources are associated with the Buck Mountain route alternative (along Segment E), as described above. These impacts are associated with the Pony Express National Historic Trail and are addressed in Section 3.16, Cultural Resources. All other potential effects to recreation, along the route alternative segments are considered minor and no mitigation measures are required.

RESIDUAL IMPACTS

No adverse effects to recreation/wilderness resources were identified on a project-wide basis, or for any of the project segments. Therefore, no mitigation measures would be necessary. As a result, the project would have no residual impacts to recreation/wilderness.

NO ACTION ALTERNATIVE

Under the No Action Alternative, recreation-related impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

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3.15 SOCIAL AND ECONOMIC VALUES

This section provides an overview of the social and economic attributes of the four counties in which the project could be located (Eureka, Elko, Lander, and White Pine counties). This section also describes the potential direct and indirect socioeconomic effects that could result from project construction and operation, such as effects on employment, population growth, property tax, sales tax, transient occupancy tax, public services, and property values of private land owners.

3.15.1 AREA OF ANALYSIS AND METHODOLOGY

AREA OF ANALYSIS

The area of analysis for social and economic values is the four-county region in which the project is located. This includes all of Eureka and White Pine counties, the northern portion of Lander County including the towns of Battle Mountain and Austin, as well as the southwestern portions of Elko County. The socioeconomic analysis describes key features of those counties crossed by the route alternatives.

METHODOLOGY

The socioeconomic evaluation focuses on the demographic and economic characteristics of the four-county region. Demographic factors include population size and density, age distribution, and projected population. Economic factors include labor force, employment levels, occupational distribution, average annual personal income, tax rates, and assessed valuation. County-level socioeconomic statistics were obtained from the U.S. Bureau of the Census, the U.S. Bureau of Economic Analysis, the Nevada State Demographer, the Nevada State Department of Taxation, and the Nevada Division of Water Planning. In some cases, data were collected through personal communications.

The assessment of construction impacts involved determining the distance between centers of social or economic activity (cities, towns, and mining operations) and the project. Route alternatives less than 10 miles from any center of social or economic activity were analyzed for their potential effect, while routes beyond 10 miles were considered to have little or no socioeconomic effect.

The assessment also evaluated whether the influx of construction workers would require additional community services or facilities, including accommodations. The construction schedule, size of the work force, project hiring procedures, population distribution, and available accommodations within the counties crossed by the route alternatives were considered. The number of hotel/motel rooms in the project area was obtained from local chambers of commerce.

Potential economic benefits from the influx of workers were also considered. The transient occupancy taxes that would be generated by the construction workers were estimated by multiplying the percentage of out-of-town workers by an average hotel/motel room rate and the number of room-nights per worker. The sales taxes accrued to the local economy from worker spending were estimated by multiplying the percentage of out-of-town workers by a standard monthly sales rate. This figure was then multiplied by the average number of months the workers would be in any one region. An average sales tax rate for the four-county region was then applied to this figure.

Revenues from property taxes assessed on the project would provide long-term benefits not only to those living in the four-county project area, but to all Nevada counties in which SPPC operates. Each county in which SPPC has wire mileage would receive a benefit. However, the counties where wire mileage is added would receive more of a benefit. Property taxes generated by the project were estimated by multiplying the estimated assessed value of the project (i.e., equal to approximately 35% of the total

project cost) by a composite Nevada property tax rate for SPPC's electric department for the 2000-2001 tax year. The assessed value was distributed among the various counties based on the wire mileage that SPPC has in each of the Nevada counties. This assigned value was then multiplied by the appropriate tax rate for each district to arrive at total Nevada property taxes, as shown in Table 3.15-4.

The potential effects on property values were derived from professional studies and academic papers referenced in primary sources published by the International Right-of-Way Association, and through personal communications with local tax assessors and realtors.

3.15.2 AFFECTED ENVIRONMENT

Historically, the economies of the four-county study area have been influenced by the economic health of the mining industries. Since the 1880s, population and economies were subject to "boom-bust" cycles that followed gold and silver strikes in the area. However, in the early 1900s, this pattern changed when copper mining and smelting dominated the economic activity in these counties, providing stable employment opportunities (BLM 1995). Although mining has historically been the primary economic activity in the area, the counties' economies have diversified into other sectors, such as trade, construction, service, and government. The following provides a social and economic overview of the four counties within the study area.

Eureka County

As shown in Table 3.15-1, Eureka County had an estimated population of 1,660 in 1997, which has increased by approximately 6% since 1990. The Nevada State Demographer estimates that Eureka County's population will increase 41% by 2018, to 2,830. In 1997, Eureka County's average age of population was estimated at 36.3 years, similar to Nevada's overall average age of 35.7 years. The County's population density was approximately 0.4 person per square mile in 1997, with the lowest density of any county in Nevada and the lowest density of the four-county project region. This figure compares with an average density for the entire state of 16.1 persons per square mile (NDWP 1999).

Most of Eureka County's population tends to be concentrated in the southern portion of the county near the town of Eureka and in the community of Crescent Valley, near the Cortez mining area. With an estimated population of 1,100 in 1997, the town of Eureka contained about two-thirds of the county's population. The community of Crescent Valley has a population estimate of approximately 200 persons (personal communication with Eureka County Chamber of Commerce, March 3, 2000).

As shown in Table 3.15-1, nearly 90% of employed persons in Eureka County work in the mining industry (3,900 in 1998). Eureka County is also the state's dominant gold producer, with gold production totaling $1.081 billion in 1997 and comprising 34% of the state's total gross proceeds on mines in that year (NDWP 1999). Due to the location of the county's major mines in the northern-most part of the county along the Carlin Trend, most of the county's mining workers reside in, and commute from, the town of Elko in Elko County (NDWP 1999). This is of special concern to county planners and officials who have the economic burdens for providing essential public services, but do not have the sales tax and residential property tax base to more fully support these services (NDWP 1999). The unemployment rate in Eureka County was 4.2% in 1998.

Eureka County's average annual wage rate in 1997 was $49,761 per worker, with the mining industry providing an annual salary of $52,784 per worker (NDWP 1999). The average annual salary of Eureka County's workers in 1997 was the highest of the four-county project region, and the highest of all Nevada's 17 counties. However, the high average salary figure greatly overstates the average salary of the county's "resident" workers, as most of the mine's workers live out of the county.

TABLE 3.15-1: ECONOMIC PROFILE OF ELKO, EUREKA, LANDER, AND WHITE PINE COUNTIES

	ELKO	EUREKA	LANDER	WHITE PINE
Population [1]				
1990	33,463	1,547	6,266	9,264
1997	47,710 Town of Elko: 19,670	1,660 Town of Eureka: 1,100	7,030 Battle Mountain: 4,500	10,640 Town of Ely: 5,190
% Change 1990-1997	+29%	+6%	+10%	+13%
Projected Population 1997-2018	+41% (81,710)	+41% (2,830)	+23% (9,170)	+20% (13,430)
Average Age	31.0	36.3	31.7	36.6
Population Density (persons per square mi.)	2.8	0.4	1.3	1.2
Employment in 1998 [2]				
Labor Force	20,750	4,522	2,760	3,804
Total Employed	19,600	4,340	2,380	3,690
Unemployment Rate	5.4%	4.2%	9.3%	3.1%
Industry Employment (1998)				
Mining	1,210	3,900	1,050	690
Construction	1,210	30	40	110
Manufacturing	240	0	40	40
TCPU*	1,120	20	70	110
Trade	3,650	100	370	660
FIRE**	510	0	30	120
Service	8,230	30	180	620
Government	3,540	250	610	1,340
Income 1997 [3]				
Average annual salary	$25,369	$49, 761	$35,883	$28,507
Average annual mining salary	$52,154	$52,784	$50,508	$48,113

[1]*U.S. Bureau of Census (1990, 1997)*
[2]*State of Nevada Department of Employment, Training, and Rehabilitation (1998)*
[3]*Nevada Division of Water Planning (1999) using 1997 US Department of Commerce data*
**Transportation, communication, and public utilities*
***Finance, insurance, and real estate*

As shown in Table 3.15-2, the current average home value in Eureka County is estimated to be $55,000. According to The Nevada State Department of Taxation, gross taxable sales in Eureka County were $173,649,694 in fiscal year 1998-1999, which is down 2.5% from the previous year (see Table 3.15-3).

TABLE 3.15-2 : CURRENT AVERAGE ESTIMATED HOME VALUES BY COUNTY

County	Current Estimated Home Values [1]
Elko	$100,000
Eureka	$55,000
White Pine	$65,000
Lander	$60,000

[1]*Estimates based on personal communications with County Tax Assessors and Desert Mountain Realty, February 29, 2000.*

TABLE 3.15-3: GROSS TAXABLE SALES COMPARISON BY COUNTY (FISCAL YEAR 1998-1999)

County	Amount	% Change from FY 1997-1998
Elko	$727,860,858	-3.7%
Eureka	$173,649,694	-2.5%
Lander	$97,931,021	-11.6%
White Pine	$109,932,613	-6.3%

Source: Nevada State Department of Taxation, 1999

White Pine County

As shown in Table 3.15-1, White Pine County had a 1997 estimated population of 10,640. The overall county population has increased by approximately 13% over 1990 population estimates. The Nevada State Demographer estimates that White Pine County's population will increase 20% by 2018, to 13,430. The county's population is relatively concentrated in the incorporated City of Ely (with a 1997 estimated population of 5,190 persons, or 49% of the county's total population) and in the nearby unincorporated towns of McGill (1997 estimated population of 1,360 persons, or 13% of the total county population) and Ruth (1997 estimated population of 470 persons, or 4.4% of the county population).

In 1997, the average age of White Pine County's population was estimated at 36.6 years. Based on 1997 population estimates, White Pine County's population density was approximately 1.2 persons per square mile (NDWP 1999). White Pine County has the second lowest density of the four-county study area, behind Eureka County.

Of the estimated 3,690 persons employed in the county in 1998, the highest percentage (36% or 1,340 workers) were employed in federal, state, and local government jobs, while 18% or 670 workers were employed in the mining industry. Although the mining industry has been highly cyclical over the past 20 years, it constitutes a crucial underpinning to the county's socioeconomic growth. Mining jobs in White Pine County averaged over $48,113 in annual salaries, a level of pay much higher than the county average annual wage of $28,507, which is the second lowest in the four-county project region, behind Elko County. The unemployment rate in White Pine County was 3.1% in 1998.

The average estimated home value in White Pine County is $65,000 (see Table 3.15-2). Home prices are down approximately 10 – 40% over the past year due in part to the closure of BHP Mine, one of the area's largest employers (personal communication with Vivian Almberg, Desert Mountain Realty, February 29, 2000). Gross taxable sales in White Pine County were $109,932,613 in fiscal year 1998, down 6.3% from the previous year (see Table 3.15-3).

Lander County

Lander County had an estimated 1997 population of 7,030, which represents an increase of approximately 10% since 1990 (see Table 3.15-1). The Nevada State Demographer estimates that Lander County's population will increase by 23% by 2018, to 9,170. The county's population is concentrated in three unincorporated towns including Battle Mountain, (4,500 residents in 1997 or 64% of the total county population), Austin (420 persons and 6%), and Kingston (250 residents and 3.6% of the total county population).

In 1997, Lander County's average age was estimated at 31 years, making Lander County the youngest county in the state and among the four counties in the project region (NDWP 1999). In 1997, Lander County had the sixth lowest population density of any county in Nevada at 1.3 persons per square miles, compared to an average density of 16.1 persons per square mile for the entire state.

Similar to neighboring Eureka County, mining is by far the dominant industry sector in Lander County. Nearly half of the county's 2,380 employed persons in 1997 were involved in the mining industry. Lander County's mines produced $304.6 million in total gross proceeds, primarily in the form of gold production, making Lander County the fourth most important county behind Eureka, Elko, and Humboldt counties in terms of mine production value (NDWP 1999). The county's average annual wage rate in 1997 was $35,883 per worker, with the mining industry showing the highest annual wage of $50,508 per worker (NDWP 1999). In 1997, the average wage rate in Lander County was the second highest in the state, exceeded only by the mining wage rate of Eureka County. Unemployment in Lander County was 9.3% in 1998, the highest rate among the four counties.

The estimated average home value in Lander County is between $58,000 - $61,000 (see Table 3.15-2). Home prices in Lander County have fallen between 5% and 12% over the past 2 years due to mine foreclosures, layoffs, and local housing supply outstripping demand (personal communication with Laura Duvall, Lander County Tax Assessor, February 29, 2000). Lander County had $97,931,021 in gross taxable sales in fiscal year 1998-1999, which is down 11.6% from the previous fiscal year. The amount of gross taxable sales in Lander County is also the lowest of the four counties (see Table 3.15-3).

Elko County

The population of Elko County was estimated to be 47,710 in 1997, which represents a 29% increase since 1990, and contains the highest population, as well as the greatest population increase, in the four-county region (see Table 3.15-1). The Nevada State Demographer estimates that Elko County's population will increase by 41% by the year 2018, to 81,710. The county's population is primarily concentrated in the towns of Elko (19,670 or 41% of the total county population), West Wendover (3,430 persons, or 7% of total county population), Carlin (2,680 persons, or 5.6% of county population), and Wells (1,540 persons, or 3% of Elko County's total population).

In 1997, Elko County's average population age was estimated at 31.7 years, making Elko County the second youngest of Nevada's 17 counties. Based on 1997 populations, Elko County's population density was approximately 2.8 persons per square mile.

Based on Elko County's 19,600 employed persons in 1998, the 8,230 jobs in the county's service industry accounted for the greatest portion of total employment at 41%. Mining's 1,210 jobs in 1998 accounted for only 6% of total employment. Nonetheless, Elko County's mining industry has constituted a crucial underpinning to the county's growth and economic well-being since the county's founding in the mid-1800s. In addition to mining operations within Elko County, the town of Elko also serves as an important mining center for operations along the Carlin Trend in nearby Eureka and Lander counties. In 1997, Elko County's mines produced $436.3 million in mineral resources, primarily gold, up significantly from $232.5 million in 1996, making Elko County the second-most important mineral producing county after Eureka County in 1997 (NDWP 1999). The highest average annual salary in Elko County in 1997 was $52,154 per worker per year, in the mining industry. This salary level was far greater than the county average annual salary of $25,369 per worker, which is the lowest average annual salary in the four-county area.

Largely due to high mining wages, the average estimated home prices are the highest in the four counties, with an average home value of $95,000 - $105,000 (see Table 3.15-2). Elko County had $727,860,858 in gross taxable sales in fiscal year 1998-1999, which is down 3.6% from the previous fiscal year but by far the highest amount of gross taxable sales of the four counties (see Table 3.15-3).

3.15.3 ENVIRONMENTAL CONSEQUENCES

This section addresses the social and economic effects associated with the project. The following describes the thresholds of significance for social and economic impacts in the four-county study area, followed by an evaluation of the project's potential socioeconomic effects region-wide.

SIGNIFICANCE CRITERIA

Thresholds of significance for social and economic impacts include the following.

- Substantial disruption of local social or economic activities due to proximity of transmission line construction.
- Overburdening of local accommodations for temporary worker housing.
- Substantial changes to local sales taxes.
- Substantial changes to the economic values of private property.

IMPACTS COMMON TO ALL ROUTE ALTERNATIVES

In general, the construction and operation of the project would have no substantial adverse social or economic impacts within the four-county study region, with the exception of potential impacts to active mining operations, which are discussed in Section 3.1, Geology and Minerals. The project would, however, have a number of positive economic effects. These effects are as described below.

Potential for Project-Related Disruption of Local Economic Activities

The primary centers of social and economic activity in the project area are the towns and communities nearest the route alternative segments, as well as the mining operations that are dispersed throughout the project region.

The project would be constructed primarily within rural regions of north-central Nevada. The cities and towns nearest to the project include Crescent Valley and Eureka in Eureka County, and Ely, Ruth, and McGill in White Pine County. None of the transmission line segments would traverse through these population centers. Some transmission line segments (B, I , and J) would pass near a few of these socioeconomic centers. These segments, and their potential effects, are described below. Other segments would be located too far away from existing towns or cities to have any discernable effect on their social or economic structure[1].

Segment B would be located approximately 1 mile west of the community of Crescent Valley, with an approximate population of 200. Due to the distance and the relatively small population of Crescent Valley, this segment would likely have no substantial socioeconomic effect, including disruption of social or economic activities located here. For additional information related to project's potential effects on this community, see Section 3.13, Land Use and Access.

Segment B would also be located approximately 0.5 mile from the Cortez Mining District operations. Potential disruptions to mining operations would be eliminated or minimized through the routing design, tower placement, and other methods of mitigation (see Section 3.1, Geology and Minerals).

[1] Segment B would be located approximately 17 miles southeast of Battle Mountain and approximately 48 miles east of Austin. Segment E would be approximately 38 miles and 40 miles from the towns of Elko and Wells, respectively. The community of Carlin would be approximately 18 miles away from the nearest portion of Segment E. Segments G and H would be approximately 6 miles from the town of Eureka. No towns or cities are located near Segments C, D, or F.

Segment I would be located approximately 2.2 miles north of the Town of Eureka (population 1,100). Due to the relatively far distance between the project from this population concentration, the project would not substantially disrupt the social and economic activities located here. Segment I would also pass within 0.5 mile from approximately 8 trailer homes located near Highway 50. Although the project would likely be visible from these homes, the project would not have a discernable effect on this small subdivision. For additional information related to project's potential effects on private properties near Segment I, see Section 3.13, Land Use and Access.

Segment J would be located approximately 10 miles north of the town of Ely (population 5,190 persons, or 49% of the county's total population), approximately 4 miles south of McGill (population 1,360 persons, or 13% of total county population), and approximately 7 miles north of Ruth (population 470 persons, or 4.4% of the county population). Due to the distance between the population centers of McGill, Ely, Ruth, and Segment J, this segment would not have substantial adverse socioeconomic effects. Potential disruptions to private lands along Segments I or J would be avoided or minimized through the routing design, including distance of tower placement and other methods of avoidance. Segment J would pass within 0.5 mile of a small, residential subdivision near Hercules Gap; however, no substantial disruptions to the social or economic setting of this area is anticipated. For additional information related to project's potential effects on private properties near Segment J, see Section 3.13, Land Use and Access.

Growth Inducing Effects

A potential issue is the degree to which the project could foster population growth. Conceptually, population growth could impose new burdens on existing community service facilities, such as expansion of waste water treatment plants, need for new schools, increased demand for fire suppression services, etc. In addition, population growth could result in the need for construction of new housing with its associated environmental impacts. If the project were to employ a sustained, large labor force drawn from outside of the area, it could induce population growth (temporary construction labor force is excluded form this consideration). If the project were to foster economic growth, it could indirectly result in population growth and the attendant environmental consequences.

In general, the project would have minor growth inducing effects. The project would require only a small number or personnel for regular inspections and maintenance of the transmission line and substations.

Population in SPPC's service area continues to grow rapidly, particularly in the urban centers in and around Reno, Sparks, and Carson City. Population growth within the project study area, however, represents only modest population increases. The project would allow an additional major transmission link to provide reliable service to the large urban centers of the state and out of state areas. It also would provide additional reliability to supply local growth.

The project would accommodate anticipated growth in northern Nevada. The project conceptually could indirectly induce growth by providing electric power to business and industry, which may be attracted to SPPC's service territory; however, the impact is speculative. In general, other forces of economic development drive population growth and development in the SPPC service area and up to now the availability of power has not been an influencing factor in that growth. These conclusions apply to the project as a whole and are not dependent on the selected route alternatives.

Potential Effect on Local Accommodations for Temporary Worker Housing

The influx of the construction labor force can have both adverse and beneficial impacts on local communities. Potential adverse effects could include overburdening existing retail facilities, such as motels and restaurants, as well as public services and facilities, such as law enforcement and public roads.

Some conflicts could exist if the construction work force competes with tourists for space in motels or campgrounds. These potential impacts are temporary and would last only the duration of the construction period in a specific area.

According to SPPC, construction of the transmission line would require at least six construction contractors with a total of about 150 workers at peak times (SPPC 2000). Construction would occur in phases; site preparation crews would be followed by assembly crews, followed by erection and reclamation crews. Material would be brought to the site from pre-determined construction staging areas along the line. Depending on how the construction phases are contracted, the construction activity would likely move in sequence along the proposed alignment. Peak activity in any one location would typically last 3 to 6 months.

Because the construction work has not been contracted yet, it is not possible to determine the geographic region of the work force. Use of the local labor force would depend on the local labor market conditions, the contractor's labor force availability, the construction status, and the time of year. However, it is estimated that local unskilled labor would be between 30 and 40% of the total workforce, and skilled out-of-town labor would be between 60 and 70% of the total workforce (SPPC 2000). The contractor has two options related to the worker housing: (1) house the workforce in hotels located in nearby urban areas and bus them to the job sites, or (2) utilize or negotiate to expand existing long-term camping facilities located near urban areas and bus them to the job sites. As the contractor has not yet been selected, it is unknown which housing option would be chosen. It is possible that the contractor may choose a combination of both housing options.

The demand for temporary accommodations would depend on the workers' home base and percentage of local versus out-of-town labor. Workers from outside the area may be housed temporarily in the towns of Battle Mountain, Elko, or Carlin during construction work along Segments A, B, C, and D. Workers may be housed temporarily in the town of Eureka along Segments E, F, G, H, and I, and the towns of Ely or McGill for Segment J. The available accommodations in Battle Mountain, Carlin, Elko, Eureka, and Ely limit travel time to most parts of the project to less than one hour. For this reason, transporting workers to the job sites from hotels or campsites would likely be the contractor's preferred method of worker transportation.

Given the relatively small size of the construction work force, adequate facilities should exist to provide temporary accommodations. The town of Ely has approximately 680-690 hotel/motel rooms, many of which are available for weekly rental (personal communication with Ely Chamber of Commerce, April 13, 2000). The largest town in the project area is Elko, with a total of 32 hotels or motels (personal communication with Elko Chamber of Commerce, April 13, 2000). The town of Eureka has 3 hotel/motels with a total of 91 rooms, most of which are double rooms (personal communication with Eureka Chamber of Commerce, April 13, 2000).

Lodging of construction crews would create additional transient occupancy tax (TOT) for local communities near the transmission line. To estimate TOT, it was assumed that 80% of the total workforce (about 120 workers) would be on the job for the entire 15-month construction window, when considering construction plus post-construction reclamation activities. It was further assumed that 50% of the out-of-town workforce (approximately 53 workers) would stay in a hotel, while the remaining 50% would stay at a long-term campsite.

TOT revenue generated by out-of-town workers is calculated as follows (note that local workers are not included in this calculation since they would be lodged at home):

53 workers X $50 per room X 450[2] room-nights = $1,192,500 in room sales
$1,192,500 X 8.00% average TOT rate = $95,400

As shown in this calculation, housing of construction workers is estimated to generate $95,400 in TOT revenue for local communities near the transmission line. These communities likely include the cities of Ely, Eureka, and Elko.

It is important to note, however, that this revenue stream does not necessarily correspond to $95,400 in additional TOT revenue that these communities would have received beyond their baseline TOT revenue. Most lodging facilities have average occupancy rates of 70 to 80% for much of the year. During peak visitor periods, this occupancy rate can approach 100%. Lodging of construction crews would likely displace some visitor lodging that would normally have occurred. Therefore, only a fraction of the $95,400 in TOT revenue, perhaps 25 to 50%, represents new, additional revenue that local communities would realize due to the construction of the transmission line.

Potential Effect on Local Sales Tax

Additional revenues may be generated through local sales taxes on purchases made by construction contractors and workers, but these revenues are generally small and transitory. Sales tax revenue would be realized from two sources: construction supplies (e.g., materials and equipment) and worker spending. Given the remoteness of the project area, it is anticipated that most construction supplies would be purchased from outside the project area and shipped to material yards as needed. In this respect, local communities would see little sales tax revenue generated from sales of construction supplies.

If construction crews are temporarily housed in communities near the transmission route, these workers would generate additional local sales tax revenue from food, beverage, and sundry sales. The incremental sales tax revenue generated by these workers is calculated as follows (note that local workers are not included in this calculation since they are already part of the local economy):

53 workers X $400 in taxable sales/month/worker X 15 months = $318,000 in taxable sales
$318,000 X 6.75% average sales tax rate = $21,465

As shown in this calculation, construction worker spending is projected to create $21,465 in additional sales taxes for the state of Nevada and local communities near the transmission line. Approximately $6,440 of this increment would go to the state General Fund, with the balance ($15,025) going to local counties and cities near the project area.

Property Taxes Generated from the Project

Revenues from property taxes assessed on the project would provide a long-term benefit to those living in the four-county project region and to all the Nevada counties in which SPPC operates. This benefit can be particularly important to those counties that have been experiencing declining tax bases, or where taxes are based primarily on one sector of the economy, such as mining. The SPPC Tax Department provided the following information on estimated property taxes generated from the proposed project.

In general, SPPC's assets, termed "electrical department," are valued as a total unit in the State of Nevada.[3] The assessed value from property taxes is calculated as 35% of the total unit value for SPPC's electric department. The county tax rate per $100 of assessed value is then spread to the various counties based on the wire mileage that SPPC has in each of the Nevada counties.

[2] 15-month construction period X 30 nights per month = 450 room-nights. This assumes one worker per room.
[3] This value is calculated using the historical cost less depreciation and the capitalized income approaches. Once each of the values are calculated, a final reconciled value is determined.

For example, first year property taxes by county were calculated by estimating the total cost of the project, multiplying by 35% to estimate the assessed value, and then multiplying the assessed value by the county's property tax rate per $100 of assessed value (2000-2001 tax year). To arrive at an overall first year property tax increase the to State, the Composite Nevada Property Tax Rate was used. The property taxes over the lifetime of the project were calculated by multiplying the estimated first year property taxes by 40 years.

The costs of the project would increase the total value of SPPC's electric department and, therefore, would increase the assessed value that would be spread to the counties. Each county in which SPPC has wire mileage would receive a property tax increase. The counties where wire mileage is added would receive a greater share of the increase than those that do not have additional wire mileage. Table 3.15-4 provides an estimate of the additional property taxes that would be generated from the three route alternatives, by county, and for the entire State of Nevada.

TABLE 3.15-4: ESTIMATED PROPERTY TAXES GENERATED BY ROUTE ALTERNATIVE

County	ROUTE ALTERNATIVES					
	Crescent Valley*		Pine Valley*		Buck Mountain	
	Miles**	Taxes	Miles**	Taxes	Miles**	Taxes
Eureka	88	$26,000	120	$31,000	62	$21,000
Elko	0	$68,000	0	$67,000	12	$66,000
Lander	38	$90,000	0	$76,000	0	$73,000
White Pine	60	$31,000	60	$30,000	93	$40,000
Other Counties	0	$727,000	0	$713,000	0	$680,000
Total State Taxes (first year)	**n/a**	**$942,000**	**n/a**	**$917,000**	**n/a**	**$880,000**
Total State Taxes (over 40-year period)* **	**n/a**	**$37,680,000**	**n/a**	**$36,680,000**	**n/a**	**$35,200,000**

* *Routes variations (a) and (b) have been excluded as the mileage difference between them (0.5 mile) would have a nominal effect on taxes in Eureka County.*

** *Mileage per county had been rounded to the nearest whole mile*

*** *Estimates are based on 40-year period. Actual amounts received will vary. This estimate is not adjusted for inflation or changes in valuation.*

Source: SPPC Rates and Regulatory Affairs Department, January 20, 2001.

As shown in Table 3.15-4, the Crescent Valley route alternatives would generate approximately $942,000 in the first year of operation and approximately $37,680,000 over a 40-year period. The Pine Valley route alternatives would generate approximately $917,000 in the first year of operation and approximately $36,680,000 over a 40-year period. The Buck Mountain route alternative would generate approximately $880,000 in the first year of operation and approximately $35,200,000 over a 40-year period. In summary, there would be very little difference among route alternatives in terms of generated property taxes.

Potential Effects on Property Values

Impacts to private property values may result where the route would be located near enough to private properties to affect their value. Such impacts may include interference with agricultural operations or obstruction of views, as well as the perceived health effects of electromagnetic frequencies (EMF) on nearby private residences (see Section 3.10, Public Health and Safety, for information about public health studies on EMF).

Various technical studies and academic papers have been completed to estimate the impact of high voltage powerlines (345 kV or higher) on nearby property values. One well-known study found that over

a 12-year timeframe, there were no negative effects on the value of vacant land due to the presence of high voltage power lines (International Right-of-Way Association 1991). For developed lots with higher-priced homes (in the $225,000- $250,000 range), there appeared to be a 0 to 5% negative effect on the value of residential lots immediately adjacent to power lines.

Most private property in the project area is in urbanized portions of the four-county region, including the cities of Ely, Elko, Eureka, and Battle Mountain. There are few residences in the rural and sparsely populated portions of the counties where most of the transmission line segments would be located. Fewer still are homes in the $225,000- $250,000 range. Personal communications with tax assessors in Eureka, Elko, White Pine, and Lander counties, as well as local realty professionals, confirm that construction of a transmission line through primarily rural and sparsely populated portions of the four-county region would have no significant adverse effect on local property values[4]. For additional information related to the visual effects on specific properties along the segments, see Section 3.9, Visual Resources.

Potential Effects on Rate Payers

Since the project costs would vary depending on which route was selected, the cost to rate payers would also vary. At 186 miles and costing approximately $97.2 million, the Crescent Valley route alternatives would be the longest and the most expensive route to construct.[5] At 168 miles and costing approximately $91.1 million, the Buck Mountain route alternative would be the shortest and the least expensive route to construct. At 180 miles and costing approximately $95.3 million, the Pine Valley route alternatives would fall in the middle.

The project's impact on SPPC's current rates is estimated to be approximately 10% of the estimated total project cost annually, plus operation and maintenance costs. The 10% annual cost approximates SPPC's rate-of-return authorized by the State of Nevada PUC. Therefore, the Crescent Valley route alternatives would result in an estimated $9.72 million annual cost to rate payers. The Pine Valley route alternatives would result in an estimated $9.53 million annual cost to rate payers, and the Buck Mountain route alternative would result in an estimated $9.11 million annual cost to rate payers.

Before any project costs could be passed along to rate payers, however, SPPC would need to file for a General Rate Increase with the State of Nevada PUC. The PUCN reviews all rate increases and would make a determination on whether to pass on any reasonable costs to the rate payers. Recently, SPPC has had several rate increases related to adjustments for energy costs or for fuel and purchased power. These rate increases do not take into account the costs associated with the construction of new electric facilities, like the Falcon to Gonder project. SPPC has not filed for a rate increase for costs associated with the construction of new electric facilities since 1991. SPPC has been able to avoid rate increases for the cost associated with the construction of new electric facilities by balancing the expenditures for new facilities with the retirement of older facilities and changes in depreciation.[6] For this reason, there would likely be no discernable effects to rate payers as a result of the proposed project.

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[4] Personal communications with Joseph Aguirre, Elko County Assessor; James Ithurralde, Eureka County Assessor; Robert Bishop, White Pine County Assessor; Laura Duvall, Lander County Assessor, and Vivian Almberg, Desert Mountain Realty, with Brad Brewster, EDAW, Inc. February 29, 2000.

[5] The project total cost estimate of $97,190,000 includes 186 miles of 345 kV line, Falcon substation, Gonder substation, environmental permits, lands and rights-of-way, and project administration. According to the SPPC Tax Department, SPPC would pay taxes on all components of project cost, including environmental permits, land, etc., not just facility costs. The estimated cost for the other routes is calculated by reducing the $97,190,000 estimate by a differential cost of $340,000 per mile for transmission line costs. All other cost components are considered equal.

[6] Source: Prepared by SPPC Rates and Regulatory Affairs Department, December 19, 2000.

Potential Effects of Access Roads

As part of the project, many miles of existing dirt roads would be improved for enhanced access, and a few new spur roads would be constructed. These improved or new roads leading from state highways to the project area would be constructed in sparsely developed locations and primarily on public lands. The improved access roads would not create a substantial disruption of local social or economic activities due to relatively remote nature of the project area. These roads would avoid population concentrations such as towns, cities, or rural subdivisions, and would avoid important economic activities such as local mining enterprises. Since most of these roads would be located on public property, the effects on local sales taxes or private property taxes would be negligible. Improved access roads may have a slightly beneficial socioeconomic effect by providing additional employment opportunities for local labor.

ALTERNATIVE-SPECIFIC IMPACTS

As described above, no substantial adverse effects to social and economic values were identified in the four-county project area, with the exception of potential impacts to active mining operations, as discussed in Section 3.1, Geology and Minerals. As described above, Segment B is located proximate to the Cortez mining operation, which is planning an expansion that could conflict with the transmission line if either of the Crescent Valley route alternatives were selected. The estimates of property taxes that would be generated by each alternative over the 40-year period are relatively similar (i.e., between $37,680,000 and $35,200,000).

RESIDUAL IMPACTS

With the exception of potential impacts to mining operations discussed in Section 3.1, Geology and Minerals, no adverse effects to social and economic values are expected as a result of the project. Therefore, no mitigation measures would be necessary. Thus the project would have no residual impacts to social and economic values.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts (including beneficial) to existing socioeconomic resources associated with this project would not occur. However, socioeconomic impacts (either adverse or beneficial) could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

3.16 CULTURAL RESOURCES

This section provides an overview of the cultural resources in the study corridor. Specifically, this section describes the area of analysis and the regulatory setting, defines cultural resources, and describes the inventory methods. This section also analyzes potential project impacts and mitigation measures.

3.16.1 AREA OF ANALYSIS AND METHODOLOGY

AREA OF ANALYSIS

A Class I cultural resource inventory (a literature search) was conducted for the area within a 4 mile corridor following the route alternatives as shown in Figure 3.16-1. A Class III inventory (an intensive pedestrian survey) was conducted along a 500 foot-wide corridor, 250 feet each side of the centerline. A comprehensive report (SEI 2000a) describes the results of the literature search and field survey.

DEFINITION OF THE RESOURCE

A cultural resource is any definite location of past human activity, occupation, or use, identifiable through inventory, historical documentation, or oral evidence. Cultural resources include archaeological, historic, or architectural sites, structures, places, objects, and artifacts (BLM 1989). The cultural resources in the project area are divided into three groups, described below: prehistoric archaeological resources, historic resources, and Traditional Cultural Properties (TCPs).

Prehistoric Archaeological Resources

Prehistoric archaeological resources are any material remains of human life or activities (i.e., sites, features, or objects) that can provide understanding of past human behavior (ARPA 1979). Prehistoric sites within the project area could be considered significant and determined eligible for the National Register of Historic Places (NRHP) if they possess integrity and have a reasonable amount of research potential.[1] Five major prehistoric research issues identified in the project area include:

1. Information about prehistoric land use in relation to site location (how the landscape was used prehistorically);
2. Information about site type, as it related to human behavior and adaptation;
3. Information about temporal change, as it pertained to the development of chronological sequences and human adaptations;
4. Information about resource procurement, trade, and territorial boundaries; and
5. Information about population movements and technological innovations (Criterion D).

Historic Resources

Historic resources are districts, sites, buildings, structures, or other objects that are associated with or convey some aspect of history (American or otherwise), architecture, engineering, and/or culture (USDI 1977). Examples of historic resources potentially occurring in the project area include roads, trails, trash scatters, town sites, sheep camps, ranches, railroads, or other physical evidence of human habitation. Historic archaeological resources are identified or interpreted through archaeological methods and techniques.

[1] While prehistoric sites can also be eligible under any of the criteria (Criterion A-D), prehistoric resources are typically eligible for their research potential (Criterion D).

Historic resources within the project area could be eligible for the NRHP if they relate directly to national, state, regional, or local themes such as exploration, transportation and communication, mining-milling (and their support services such as wood cutting, charcoal manufacture, and water procurement), ranching and farming, urban development, or government and political activity, as described in the Nevada Comprehensive State Plan. Such properties could be eligible under Criterion A of the NRHP when they relate to significant historic events. The NRHP and the criteria under which cultural resources may be eligible for listing are further described in the following section, Regulatory Framework. Properties associated with events specific to Western Shoshone history and culture in the project area also may be eligible under Criterion A. These sites are defined as "Ethnohistoric Western Shoshone Properties" in this section of the EIS. In all cases, NRHP-eligible properties must also retain sufficient integrity to convey their importance.

Historic properties in the project area could also be eligible under Criterion B of the NRHP if they are associated with notable individuals and illustrate an important person's achievements. Examples of important persons specific to Native American history and culture in the project area may include treaty signers, traditional doctors, war chiefs, and mythological heroes of the Western Shoshone.

Properties eligible under Criterion C of the NRHP in the project area may include, but are not limited to, bridges, railbeds, mining structures, stage stations, town buildings, or Native American properties. A mine extraction or milling layout with sufficient integrity and intact remains to demonstrate that important innovations or techniques were practiced, or where evidence of other than standard technologies is present, may be eligible under Criterion C. Significant buildings or structures eligible under the criterion might have been designed by notable architects, or could demonstrate design elements of a type, period, or method of construction unique at the time. Examples of Native American properties eligible under Criterion C include exemplary traditional areas or the work of a master, such as a landmark or feature associated with oral traditions or cultural practices, a prime example of a resource area, or rock art.

Properties significant under Criterion D of the NRHP include, but are not limited to, exploration of the West, mining activities, ranching, traditional Western Shoshone sites, and prehistoric sites. For example mining properties eligible under Criterion D may demonstrate changes in mining technology or its use, or contain intact remains of mining activities that exhibit spatial integrity, with sufficient quantity and variety of artifacts to provide new archaeological information regarding those mining activities. Significant residential properties might also demonstrate the potential to provide information about the domestic arrangements of miners, including unusual and unique kinds of housing or foodways, or information about the presence of poorly documented ethnic or cultural groups.

Ranches or mining/milling facilities eligible under this criterion might contain intact material and features with sufficient integrity to shed light on ways of adaptation to mining or ranching, working conditions, or flow of work, or on lifeways of individuals who were employed in support systems for miners, other workers, or members of ethnic groups. Examples of Native American properties eligible under Criterion D include areas important as settings for eliciting information about the past or for telling a traditional story, or an archaeological site with potential for distinguishing historic Western Shoshone camps from contemporary Euroamerican camps. Other properties eligible under Criterion D may be prehistoric sites with the potential to address unresolved chronological or settlement/subsistence related issues, or sites from underrepresented time periods such as pre-Archaic sites that occur on the margins of Pleistocene lakes.

Sierra Pacific Power Co.

FALCON to GONDER Project

Cultural Resource Survey Areas

Field Survey Area (500-ft study corridor)
BLM Report Numbers:
Battle Mountain 6-2131
Elko 1-1973
Ely 99-1309

Areas Previously Surveyed
BLM Report Numbers:
6-0467 (Mt. Hope Area)
6-1368 (Cortez Area)

Areas Not Surveyed
(due to restricted access)

National Historic Trails
Pony Express
California Trail

Land Ownership
U.S. Forest Service
U.S. Bureau of Land Management
U.S. Fish & Wildlife Service
State Parks & Recreation
American Indian Reservation
Private

TRANSMISSION LINE
Route Alternatives

Scale 1 : 760,320
(33% reduction of original)

Kilometers 5 0 5 10 15 20 25 30
Miles 5 0 5 10 15 20

1" = 12 miles

GIS Mapping by **EDAW, Inc.** — San Francisco

03/02/01

Figure 3.16 - 1

Traditional Cultural Properties (TCPs)

TCPs are historic properties or locations that have associations with cultural practices or beliefs of a living community and are rooted in that community's history and are important in maintaining its cultural identity (NPS 1992). TCPs are recognizable places with boundaries that maintain associations to the events or people referenced, and that continue to confer and reinforce cultural identity. Examples include areas where culturally significant activities and practices have occurred in the past and continue to occur, or may be landmarks that continue to invoke past events or people (physical or intangible). Examples may also include sacred sites; topography associated with oral traditions; areas where ceremonies and other events continue to take place; and locations where traditional economic, artistic, or other cultural practices continue to reinforce cultural identity. Archaeological sites or places may be eligible for listing on the NRHP as a TCP if associated with continuous traditional practices or beliefs important in maintaining cultural identity. These properties are identified by members of the community for whom they are significant, in this case, the Western Shoshone. The ethnographic setting, described in Section 3.16.2, provides a general context for identifying and evaluating the significance of TCPs in the project area.

REGULATORY FRAMEWORK

National Historic Preservation Act

Consideration of the effects of federally regulated undertakings on cultural resources is governed by the National Historic Preservation Act (NHPA) of 1966. Regulations in 36 CFR 800 (revised 1986) outline the process through which this historic preservation legislation under the NHPA is administered. Regulations at the agency level (e.g., BLM 1988) detail the review process.

The National Programmatic Agreement (NPA) among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers regarding the manner in which the BLM will meet its responsibilities under the NHPA is the National BLM authority for meeting requirements of the NHPA. Day-to-day operations are based on the protocols developed by the local BLM offices with each state. In Nevada, the State Protocol Agreement between the BLM and the Nevada State Historic Preservation Office (SHPO) defines how the SHPO and the BLM will interact and cooperate under the NPA, and provides direction for implementing the NHPA.

The National Register of Historic Places (NRHP) maintained by the Secretary of the Interior is the nation's inventory of important historic resources. Section 106 of NHPA stipulates that federal agencies must allow the Advisory Council on Historic Preservation an opportunity to comment on federal agency undertakings, including those that may affect properties eligible for the NRHP.

As the lead federal agency for the project, the BLM is responsible for compliance with Section 106 of the NHPA in coordination with other cooperating federal agencies. This coordination involves review by the Nevada SHPO regarding the significance and effects on properties considered to be eligible for the NRHP. The SHPO has been a cooperating agency with the BLM since the early planning stages of the project.

Qualifications for Listing Cultural Resources on the NRHP

The National Park Service has established three main standards that a resource must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, a resource generally must be at least 50 years old[2]. To meet the integrity criteria, a resource must "possess integrity of location,

[2] Resources less than 50 years old may be eligible for the NRHP if they are of "national significance." No resources less than 50 years old within the project area meet the criteria for national significance.

design, setting, materials, workmanship, feeling, and association" (36 CFR 60.4). Finally, a resource must be significant according to one or more of the following criteria:

1. Possess association with important events that have made a significant contribution to the broad patterns of our history (Criterion A).
2. Have an association with the lives of important persons (Criterion B).
3. Display distinctive characteristics of a type, period of method of construction, such as unique architecture, craftsmanship, or design (Criterion C).
4. Have the capacity to provide important information about the past (Criterion D) (ACHP 1991).

TCPs eligible for the National Register, like other historic properties, must be at least 50 years old and must also meet one or more of the four criteria of significance described above. TCPs must also demonstrate integrity of relationship. For example, the property must be recognized by contemporary groups as important to their cultural heritage, and the physical condition of the property must be sufficiently intact to invoke the historic associations. Under the State Protocol Agreement, the BLM will consider the effects of undertakings on historic properties that are eligible for the NRHP as TCPs according to the guidance in National Register Bulletin 38: Guidelines for Evaluating and Documenting TCPs.

NHPA Amendment for Protection of Native American Values

As discussed above, Section 106 of the NHPA 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 consideration from archaeological sites and historic buildings (NPS 1986) 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 the following: 1) identifying potentially eligible properties and the values that make them eligible; and 2) assessing project effects on such properties, including identification of mitigation measures where possible.

National American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), 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. NAGPRA 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. Repatriation, on request, to the culturally affiliated tribe is required for human remains and associated funerary objects. Repatriation of other cultural items is dependent upon whether or not the original acquisition of an item was from an individual with the authority to alienate it from the tribal group (43 CFR Part 10).

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 in 1978. It requires the following actions from federal agencies: (1) accommodate access to and ceremonial use of sacred sites by Indian religious practitioners; and (2) 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.

American Indian Religious Freedom Act of 1978

The American Indian Religious Freedom Act of 1978 affirms United States policy that federal agencies will ensure 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.

INVENTORY METHODS

A summary of the inventory methods related to cultural resources (prehistory, history, and ethnography) in the study corridor and surrounding region is provided below. The inventory methods are organized in terms of literature searches and field surveys for all types of cultural resources.

Literature Search

The first step of the cultural resource inventory consisted of a literature search of existing records to identify previously recorded cultural resources. Record searches of the original route locations were conducted at the Nevada State Museum and the BLM Battle Mountain, Elko, and Ely Field Offices. Maps and site records covering a 2-mile area on each side of the 500-foot wide corridor were examined for the presence of previously recorded sites. U.S. General Land Office (GLO) plat maps were also examined in the Public Room of the State Office of the BLM as well as at the various field offices for the presence of historic roads, trails, telegraph lines, railroads, ranches, and homesteads.

The records search and literature review indicated that many previous small surveys crossed the proposed route alternatives, while a few areas have received considerable attention as part of extensive developments. Much of Whirlwind Valley had been surveyed as part of a gold mining operation in the early 1990s, while a similar operation in the 1980s was conducted in the Mount Hope Mining District, part of which lies in Crescent Valley. A previous high voltage transmission segment between Eureka and Ely was surveyed in 1971 and site records prepared, but no comprehensive report was written and no historic sites recorded.

Ethnographic studies related to TCPs involved research of published ethnographies and history, unpublished archives, interviews with ethnographers and agency personnel with experience in the area, a series of meetings and interviews with Western Shoshone tribal representatives, presentations to tribal councils, and focused interviews and field trips with individuals especially knowledgeable about the history of land use and traditions associated with the project area. Meetings and interviews were focused on identifying Western Shoshone historic properties and potential TCPs.

Field Survey

An intensive (Class III) cultural resources field survey was conducted on lands within the study corridor to determine the existence of prehistoric and historic archaeological resources (Summit Envirosolutions 2000a). A Class III cultural resources field survey is a walking survey with crew members spaced no more than 30 meters (100 feet) apart. As the alternative routes cross areas administered by three BLM Field Offices (Battle Mountain, Elko, and Ely), the surveyors completed the survey in compliance with a common set of stipulations designed for the project. The field survey was undertaken between May 24 and July 22, 1999.

Archaeological sites were defined as two artifacts or more within 50 meters of one another, separated from other artifacts by a distance of at least 50 meters. Sites such as historic roads identified in the literature search and noted on field maps, but which may have no associated artifacts, were also recorded.

Teams of three to seven archaeologists, headed by individuals meeting BLM professional requirements for crew chiefs, walked the study corridor and recorded archaeological sites at the required 30-meter interval. During much of the survey, a Native American tribal representative participated on each crew. Survey coverage sometimes varied from the 30-meter interval transects due to restricted access, extreme topography, or in areas that were previously inventoried.

Archaeological sites were recorded on Intermountain Archaeological Computer System (IMACS) forms. When sites or isolated artifacts were encountered, the area was transected at closer intervals to identify any additional associated artifacts or features. Sites were photographed, artifacts sketched, and site layout maps prepared. Isolated finds were primarily mapped using GIS mapping units, described, and sometimes illustrated. The site forms are presented as an appendix item to the Class III field survey (SEI 2000a).

Visual impacts to sites eligible for the National Register under Criteria a, b, or c were also evaluated during the inventory.

Privately owned and potentially historic ranches within two miles of a route segment were also recorded for potential visual effects on these resources. Buildings greater than 50 years in age and potentially historic features were recorded, mapped, and photographed. These ranches were recorded on Historic Property Inventory Forms as an attachment to the archaeological IMACS forms.

3.16.2 AFFECTED ENVIRONMENT

PHYSICAL SETTING

Spanning the north central part of the hydrologic Great Basin, an area of internal drainage outlet solely by evaporation, the project route alternatives cross a diverse array of climatic, geological, geomorphological, biological, and hydrological settings (Fiero 1986; Houghton et al. 1975; Stewart 1980). The dynamic nature of these settings undoubtedly influenced past land uses and patterns as evidenced by the varied locations of cultural resources found during the cultural resource inventory.

The project area spans the northern reaches of the physiographic or geologic province of the Great Basin, a region characterized by uplifted and tilted ranges punctuated by intervening valleys (Stewart 1980). Ranges found along the corridor include Malpais (northern arm of Shoshone Range), Cortez Range, Sulphur Spring Range, Roberts Mountains, Whistler Mountain, Diamond Mountains, southern Ruby Mountains, Butte Mountain, Egan Range, and the southern Cherry Creek Range. Valleys include Boulder Flat, Whirlwind, Crescent, Grass, Pine, Kobeh, Diamond, Huntington, Newark, Long, and Steptoe. Major water sources past and present crossed or adjacent to the study corridor include the Humboldt River, Beowawe Geysers, Indian Creek, Shoshone Wells, Pine Creek, Henderson Creek, Vinini Creek, pluvial lakes in Grass, Diamond, Newark, Jakes, and likely Crescent Valleys, and Hercules Gap Spring (Mifflin and Wheat 1979).

Landscapes and their associated landforms also influenced past cultural land use in the project area. Near-flat and gently sloping surfaces such as alluvial fans, fan piedmonts, fan skirts, alluvial flats, and playas, as well as ridge tops, passes, and stream terraces, contained the most cultural resources. These types of landforms convey potential ease of travel, possible water sources, likely prehistoric camping locations, and historic ranch, field, and mining locations (Peterson 1981). Mountain slopes contained the fewest cultural resources, with isolates, quarries, and mining-related endeavors being the primary resource types in these locations.

CULTURAL SETTING

Prehistoric Cultural Setting

The Falcon to Gonder project area occupies a cultural landscape abundant with evidence of past occupation of the region. Archaeological investigations in the region have documented human occupation of the area for approximately the past 11,000 years. Four broad time periods, or "phases," are generally recognized to define the cultural chronology of the region: Pre-Archaic (9000+ – 6000 B.C.), Early Archaic (6000 to 2500 B.C.), Middle Archaic (2500 B.C. to 700 A.D.), and Late Archaic (700 to 1850 A.D.). The temporal periods correspond in a general way with climatic regimes and changing trends in cultural patterns for settlement, subsistence, and material culture. These temporal associations are based on projectile point styles and a small number of radiocarbon dates. The following sections offer further information regarding these four temporal periods.

Pre-Archaic

Implements from this time period include Great Basin fluted points (Clovis). These are rare in the vicinity but include finds from Crescent Valley, Ivanhoe Creek near Tosawihi Quarries (Schmitt and Dugas 1992), the southern end of Big Smoky Valley on the edge of pluvial Lake Tonopah, and in Long Valley. Partial remains of a Pleistocene mammoth were also found on the western flank of the Cortez Mountains. Two fluted point fragments were found associated with Great Basin stemmed points at Rye Patch Reservoir (Rusco and Davis 1987). Two Pre-Archaic site areas lie east of the project area. The Sunshine Locality is about 10 miles east of the project area and the Gravel Bar sites are about 55 miles south of the project area. This last site represents one of the earliest occupations in Nevada. While no intact subsurface deposits have as yet been documented in these areas, they attest to the wide geographic extent of Pre-Archaic activity in the region. Another Pre-Archaic site near the project area is located in the northern part of Grass Valley, where extensive scatters of early basal assemblages have been recorded.

Great Basin stemmed projectile points, concave base lancelet points, crescents, scrapers, knives, and the first, albeit limited, assemblages of groundstone (Grayson 1993:240) denote later parts of the Pre-Archaic. Dated deposits in the Great Basin come from Fort Rock Cave, Connley Caves, Last Supper Cave, Danger Cave, Hogup Cave, and Smith Creek Cave with the earliest being ca. 9200 B.C. and the youngest ca. 5500 B.C. Four Great Basin Stemmed points were found during data recovery of the West Sinter Quarry (Livingston and Pierce 1988). Several sites containing stemmed points, large flake-based scrapers, and late stage bifaces were identified around the western margins of Whirlwind Valley, confined primarily within elevations between 5,000 and 5,500 feet above mean sea level (Ingbar and Ataman 1994). This group of sites is thought to be among the few in the region identified as dating almost exclusively to the Pre-Archaic.

Early Archaic

This era is marked by Large Side-notched (post ca. 5000 B.C.) projectile points in the north, large concave-based Triple-T and Humboldt Series at Gatecliff, and by Pinto Series points in the South Fork shelters. Groundstone tools become more widespread and may suggest greater reliance on higher cost resources, such as seeds. Presumably due to the generally warmer and drier conditions, populations in the central Great Basin seem to decrease during this time with a large growth in population for the area noted at 2500 B.C.

Middle Archaic

Hallmarks of this period include Gatecliff Series projectile points at Gatecliff Shelter, although in the north central and northeastern Great Basin, the Humboldt, Pinto, and even Elko Series projectiles are present. Groundstone tools such as manos, metates, mortars, and pestles also become a noticeable part of the tool assemblage. Elko Series projectile points and use of a variety of environments including mountaintops characterize the end of the Middle Archaic, ca. A.D. 700-850 B.C. Quarrying at Tosawihi

increased, while James Creek and South Fork shelters were inhabited as short-term camps with increasing occupation. A distinctive archaeological assemblage known as Fremont, ca. A.D. 400-1300, appears in limited areas of far eastern and southern Nevada by about A.D. 500, denoted by pit houses and surface structures of masonry and stone as well as distinctive ceramic wares.

Late Archaic

A common chronological marker in the first part of this period (ca. A.D. 700-1300) is projectile points of the Rosegate Series, which include the Rose Spring and Eastgate varieties. A major technological change from atlatl and dart to bow and arrow is associated with the appearance of this point type. Intensive quarrying is discerned at Tosawihi, as are substantial habitations at James Creek Shelter (including bison processing), the Pine Valley sites, and South Fork shelters suggesting long-term (possibly annual) occupation. Generally, the Upper Humboldt region contains a wealth of sites relating to this phase including those in upland areas, suggesting that for many sites the most intensive occupation was at this time. Newark Cave (Fowler 1968), in Newark Valley on the edge of Buck Mountain, is situated near the project area. Point types from the Late Archaic and Middle Archaic were found there, as were examples of Intermountain Brownware and one specimen of older Fremont ceramics.

The period from 1300 A.D. to the pre-contact historic era (1850) is characterized by Desert Series points and Intermountain Brownware pottery. Quarrying activities at Tosawihi sharply intensify, use of uplands is less common, and some breaks in occupation are noted from the early to middle part of this time at James Creek, South Fork, the Rock Creek narrows (Clay 1997; Clay and Hemphill 1986), and the Argenta Rim sites. High altitude villages are found in the White Mountains (Bettinger 1991; Delacorte 1991) and the Toquima Range (Thomas 1982) and may indicate an expansion of close-packed populations from the previous times into less hospitable environments.

Dramatic changes occurred to the local Native American culture due to intensive contact with Euroamerican settlers, beginning in the mid-nineteenth century. For example, resources such as grasses and springs were destroyed or made inaccessible as stock animals grazed and the concept of private ownership was imposed. The native people retained many beliefs but found that traditional patterns of settlement and subsistence were no longer possible. They gradually oriented to a labor-based cash economy, often on the margins of ranches, mining towns, and other settlements. Impoverishment and discrimination often characterized their condition.

Archaeological sites are recognized through the presence of a combination of Euroamerican and aboriginal artifacts. Site types may include homesteads, farms or ranches, pinyon gathering camps, neighborhoods on the fringes of mining towns, and reservation settlements. Among the Numic speakers, the Western Shoshone people are dispersed near the project area in individually owned properties, allotments and reservation lands, and mixed into the present economy as ranchers, miners, etc.

Historic Cultural Setting

The earliest exploration in northern Nevada occurred in 1826 by trappers led by Peter Ogden along the headwaters of the Bruneau and Owyhee rivers. In 1828, Ogden's group trapped east along the Humboldt River, camping about 2 miles north of present-day Beowawe near Segment A of the project (Roberts 1989:257). The central and eastern portions of the project area were not explored during these earliest periods, although fur trapper Jedediah Smith crossed Nevada in 1827 along a route approximating modern Highway 6 south of the project area.

Exploration continued with migration and overland travel. Early emigrants established several routes to California and Oregon using a variety of passes and cutoffs. In 1841, the Bidwell-Bartleson group became the first wagon train to reach California via fur trapper routes along the Humboldt River. In Nevada, the California Trail followed the Humboldt River but branched after it emerged from Emigrant

Pass west of Carlin, one route going west and north and a second turning south to cross the Humboldt at Gravelly Ford, about 3 miles east of present-day Beowawe. The two routes are located not far apart at present-day Dunphy, near the north end of Segment A of the project.

The Hastings Cutoff, another alternate route of the California Trail, went south along the East Humboldt Range and the Ruby Mountains, then north through Huntington Valley (near Segment E) and along the Humboldt's South Fork to the main river (Hunt 1980:66, 97-98). In just a few years, emigrants flooding the Humboldt River disrupted centuries-old Shoshone settlement and subsistence patterns. Incidents between European Americans and Native Americans began in 1833 when American fur trapper Joseph Walker resorted to arms against Native Americans. The emigrants continued this pattern of conflict.

Most emigrants followed the Humboldt River route, but early explorers penetrated some valleys within the vast unexplored interior of Nevada. In 1845, exploration in central Nevada began with John Fremont's third expedition. Sending the Walker party along the Humboldt River, Fremont led a group from Franklin Lake in Ruby Valley across Harrison Pass and Huntington Valley into Diamond Valley, heading southwest to pass south of Roberts Mountains (Vlasich 1981:215).

In 1853, Captain John W. Gunnison and then Lieutenant E.G. Beckwith led a party to explore a railroad route that would avoid the Humboldt River corridor. The party moved south through Ruby Valley, across the Ruby Mountains at Overland Pass, across the north end of Diamond Valley into Garden Valley and Pine Valley, and probably used Cortez Canyon to enter Crescent Valley and rejoin the Humboldt (Vlasich 1981:216). John Reese explored a route in 1854 that entered Nevada somewhat south of Fremont's trail, which it joined near the south edge of Roberts Mountain (Bancroft 1981:75). Reese and Captain James H. Simpson's wagon road survey of 1859 established the Central Route, a faster, shorter route across the country that avoided Native American hostilities along the Humboldt River.

Native American bands organized to resist the emigration, preserve their own lives, and protect native lands and food sources. A Reese River Valley band consisting of 300-400 persons negotiated a treaty in 1861 granting travel concessions but retaining ownership of lands and resources.

In the spring of 1860, the Pony Express service began to provide mail delivery between Salt Lake City and Sacramento. The Central Route was used and 28 stations were developed for riders and horses. Stations in the project vicinity included Dry Creek at the east foot of the Simpson Park Mountains, Grubs Well in Kobeh Valley, Robert's Creek south of Robert's Mountains, and Sulphur Springs on the west side of Diamond Valley. Grub's Well, Robert's Creek, and Sulphur Springs stations were shared with the stage and mail services (BLM 1997). The Pony Express operated between April 1860 and October 1861. The service was expensive, and riders and station keepers faced constant danger. The demise of the Pony Express was assured when the transcontinental telegraph line, constructed along the Central Route, opened in October 1861, sending in ten seconds a message that took the Pony Express 10 days to deliver.

Settlement and mining began almost concurrently in the 1860s. Stage and freight lines connected communities and booming mining camps, to be abandoned as camps went "bust." The railroad period of 1867-1883 occurred within the longer span of settlement and mining, and portions of abandoned railbeds, along with stage and freight trails, evolved into the state and federal highway transportation system.

Mormons were the first European American group to settle in the Great Basin, at Salt Lake in 1847. The 1848 discovery of gold in California and subsequent hordes of emigrants helped support the settlement, whose members exchanged grain and produce for clothing, other goods, and livestock (Bancroft

1981:65; Vlasich 1981:222). Mormons and others soon established trading posts and small settlements along the Humboldt River route. Salt Lake City governed the unsettled eastern regions where the project is located. The Territory of Nevada was established in 1861, and Nevada became a state in 1864 (Elliott 1984:50-69).

The 1860s saw the birth of mining in Nevada, when unsuccessful Comstock Lode miners fanned out into Nevada. Mining camps went boom and bust during the 1860s and 1870s, and counties were formed and reformed. When the Reese River Mining District was formed at Austin in 1862, Lander County, encompassing about one-third of the area of Nevada, was created from Humboldt and Churchill Counties (Angel 1958:461). In 1869, White Pine County was created from Lander County, which was further reduced in 1873 when Eureka County was created. Mining farther north commenced in 1862 with the discovery of minerals in the Cortez region, followed in 1863 by finds of silver ore at Galena near the Humboldt River.

The Cortez Mining District, at the south end of Crescent Valley and straddling the Lander-Eureka county line, is historically significant and well documented. Three other communities in the Cortez District included Shoshone Wells, situated at a spring at the foot of the Toiyabe Range 2 miles west of the town of Cortez; the camp of St. Louis at the west foot of Mount Tenabo; and Garrison, a small community near the Garrison Mine on the upper reaches of southern Mount Tenabo, the last of which was occupied between approximately 1900 and 1910 by a large group of Chinese mine laborers (Paher 1970; Zeier 1993:14-17).

In northern Eureka County, the Beowawe Mining District was operating by 1880. The Modarelli Frenchie Creek District lies in northwest Pine Valley on the northeast side of the Cortez Mountains. In 1908, the Buckhorn Mining District was organized on the southeast side of the Cortez Mountains. The Mineral Hill Mining District was established on the northwest slope of the Sulphur Spring Range on the east side of Garden Valley in 1868 by miners from Austin, where ore was initially processed.

Before and during the mining boom, ranches and farms developed along the Humboldt and its tributaries, while settlements and trading posts grew into major commercial settlements (Patterson et al. 1969:211-268). Some large ranches (e.g., approximately 20,000-150,000 acres) came to exist such as the T Lazy S Ranch in Boulder Valley and Rock Creek near Midas, the Horseshoe Ranch (begun in 1872) near Maggie Creek north of Carlin (Patterson et al. 1969), and the W.T. Jenkins Ranch, founded in 1877 near Battle Mountain.

In Eureka County, the Eureka mining district is the most important, discovered in 1864 and producing $52.2 million between 1866 and 1940. High temperature smelting required vast amounts of charcoal, and the most important ancillary service in the Eureka District was charcoal production. This voracious demand resulted in the total loss of pinyon, pine, and juniper forests surrounding Eureka. By the mid-1870s, Eureka was the second largest town in Nevada and reached its maximum population of more than 7,000 people.

Railroads, and later highways, were also influential in the settlement patterns of the region. Settlement was galvanized by the construction of the Central Pacific Railroad (CPRR) which, by 1869, produced a relatively reliable and safe means of transport across the continent, including sidings or stations at strategic locations such as Argenta, Battle Mountain, Beowawe, and Palisade (Mordy and McCaughey 1968:85, 88; Myrick 1962:1-19). The Eureka and Palisade Railroad (E&P) was completed in 1875, tying Eureka to the transcontinental Central Pacific; the smaller Ruby Hill Railroad, moving ores from mines to smelters, was completed the same year. By 1891, the major smelters were closed. The Ruby Hill Railroad was abandoned in 1893.

Land use in the area also reflects governmental attempts to attract settlers, including the Desert Land Act of 1877, the Enlarged Homestead Act of 1909, and the Cattlemen's Homestead Act of 1916, among others.

In Nevada history, the twentieth century is associated with a second mining boom, this time with copper discoveries spurring the boom. In the project area, the Robinson/Ely District, a relatively unproductive district from 1868 to 1902, accounted for about 95% of White Pine County's total historic production of $400 million (Couch and Carpenter 1943:143), more wealth than generated by any other district in Nevada (Smith 1976:65). New copper prospects brought more than 50 new mining companies into the area between 1902 and 1907 (Smith 1976:67). The Nevada Consolidated-Kennecott opened in 1909 and consolidated claims through the years. Molybdenite was first recovered in 1941, highlighting the diversity of the copper mining enterprise, which thrived until the late twentieth century.

World War I and World War II stimulated mining and increased production, but Nevada suffered through the Depression with the rest of the United States. Federal spending programs, such as loans, funds from the Civil Works Administration (CWA) and Civilian Conservation Corps (CCC), and public road monies, sustained Nevada from 1933 to 1939 (Elliott 1973:297). These funds supported programs that built roads, ditches, and canals; drilled wells; painted buildings and structures; and conducted archival surveys throughout Nevada.

Many quantitative changes occurred in Nevada during the twentieth century. Individual endeavors were replaced with or consolidated into corporate enterprises in mining, commerce, and ranching. Mining and agricultural centers either died or shifted their services to the tourist trade, especially along transportation corridors such as the Lincoln Highway and the Victory Highway.

In 1917, the Nevada Department of Highways was organized in response to the Federal Aid Road Act, which promised money for work on roads carrying mail-in states with highway departments and road surveys. Principal wagon roads evolved into primary auto routes, while smaller, rural feeder routes were either ignored or upgraded, depending upon the amount of use they received. The Lincoln Highway, later US 50, was the nation's first attempt at a transcontinental motorway, preceding any formal federal or state improvement programs. East to west, the highway was slated to pass through ten states before entering Tippett, Nevada on the Utah State line southwest of Salt Lake City and northeast of Ely.

It proceeded from Ely westward to Eureka, Austin, Fallon, and finally Reno, largely following the route of the Pony Express and, incidentally, not that of the Transcontinental Railroad or Humboldt Route of the Emigrant Trail. The Department of Highways changed the designation of the roads over the years from named roads to route numbers and eventually to US Highways. Road surfacing changed with the designation; in 1929, gravel oiling was introduced and by 1936, most highways were paved with asphalt and Portland cement (State of Nevada 1919-1936; Stornetta 1993). By the 1960s, State Route 50 (previously the Lincoln Highway) was generally realigned to its present configuration and redesignated US Highway 50.

Ethnographic Setting

In the project area, the distinction between prehistory and history corresponds to contact between the Western Shoshone (the Newe) and Euroamerican fur trappers in 1827 and the beginning of written records about central Nevada. Ethnographic sources (e.g., Steward 1938) provide valuable descriptions about the Newe culture after contact, which provides insight into elements of pre-contact culture, social organization, and land use. The Newe, although devastated by Euroamerican encroachment and appropriation, persist as a people with a history of their own.

Ethnohistory draws on both ethnography and history not only to construct a unique cultural history from their perspective, but to reconstruct the role of the Western Shoshone in a collective history. This

section summarizes the overview drawn from various ethnographies, histories, and contributions from tribal representatives and cultural specialists. This review of Newe cultural history provides a chronological and thematic framework for evaluating TCPs as defined by Bulletin 38 (NPS 1992) within the project area, and a context for understanding the inalienable relationship to the land that is fundamental to Newe worldview.

The Aboriginal Lifestyle - Hunting and Gathering

According to recent ethnohistories (Crum 1994; Inter-Tribal Council 1976; Janetski 1981), extended kin groups of Western Shoshone people, or Newe, have occupied the project area as part of a larger traditional territory, roughly from southern Idaho to Death Valley, bounded to the west by the Smith Creek Mountains in central Nevada, and to the east by the area around Ely, Nevada, in the Great Basin region from time immemorial. Ethnographic sources (e.g., Janetski 1981; Steward 1938; Thomas et al. 1982) concur that the Newe were well established in the area by the time of the first Euroamerican encounter (i.e., fur trappers ca. 1827). Scholars continue to debate the arrival of the Newe and other Numic speakers into the Great Basin. Most linguists support a fan-like migration from a southern homeland, somewhere near Death Valley about 2,000 years ago. Others view the Great Basin as the Numic homeland.

Traditionally, the Newe were hunter-gatherers. Generally, extended family groups wintered together in traditional campsites of 2 to 10 camps spaced one-eighth to one-quarter mile apart, located near permanent springs from fall until spring in dome-shaped houses of willow or tule (Steward 1938:232). In spring, family groups dispersed to harvest resources as they became available. Particularly rich and large resource areas such as the Owyhee River Basin, the Humboldt River, and the Ruby Mountains concentrated groups into large camps of up to 50 households for weeks at time. Fish spawns were particularly important in the spring along the Humboldt and its tributaries.

Groups converged for the fall pine nut harvest, critical for winter stores, and for the pine nut ceremony, the *Gwinii*, called for by one of the leaders who also directed the harvest. The *Gwinii* was a religious ceremony that entailed important political and social exchange; new leaders and marriage partners were chosen and people exchanged information about resources. Groups from pine nut areas, such as those at the base of the Roberts Mountains, wintered nearby, while others relayed baskets of nuts to caches en route to their own wintering grounds and home bases.

Religious Traditions and Connection to the Land

Traditional observances and round dances before and after the pine nut harvest, which became the fandango in more recent times, are particularly important social gatherings with a strong emphasis on community and cultural reinforcement with roots in the tradition of honoring nature and spiritual observance.

Contact

The first written accounts of contact with Euroamericans in the project area date from fur trapping expeditions in the late 1820s, and these and later explorations initiated profound environmental degradation already visible by 1845. In 1849 alone, it is estimated that over 50,000 people traveled to California along the overland route through Newe country (Crum 1994:18). Euroamerican ranchers and other settlers soon followed, appropriating the resources they did not destroy, and then a subsequent history of conflict and displacement lead to various federal programs to "mainstream" the Newe (Crum 1994:51).

By 1857, it was apparent that whites were settling and the need for resolving the "Indian problem" eventually lead agents to set aside "six miles square" in Ruby Valley in 1859. The Tosawihi leader, Sho-kup (Tsokkope), and Temoke moved their bands to the Ruby Valley reservation, hoping cattle raising and farming would replace rapidly disappearing native resources. Meanwhile, white immigration and

overland travel began encroaching into other parts of Newe territory with the establishment of the Central Route of the California Trail in 1859, also used by the Pony Express until 1861 and then by the Butterfield Overland mail company. The Newe in this region also organized retaliatory bands to fight whites. The largest (about 300 to 400 people) and best known of the retaliatory bands was led by Tu-tu-wa (Toi-Toi) of the Reese River Valley.

Treaties and the Reservation Era

In 1863, the Ruby Valley Treaty (ratified in 1866) was signed by roughly one-fourth of the Newe bands. Termed the "Western Shoshone" for the first time, 12 band leaders signed the Ruby Valley Treaty (Crum 1994:26). By 1877, Tosawihi leader Captain Sam had requested and obtained land in Duck Valley where a "Western Shoshone" reservation was created, acceptable to the Tosawihi as it was within a traditional resource area. By 1880, however, only about a quarter of the Newe had moved to the Duck Valley, since "groups remained deeply attached to their own particular regions" (Crum 1994:59).

Many Western Shoshone continued to live in traditional bands in ancestral areas located in the project area, including Diamond and Pine Valleys (Steward 1938). Some traditional activities generated modest income as they reinforced cultural identity, including bartering pine nuts and selling baskets. During the early part of this century, fandangos (i.e., multi-day cultural celebrations featuring traditional foods, round dances, songs, and hand games) provided a forum for socializing, political discussion, and elections, in ways the *Gwinii*, had once functioned. In later years, the fandango incorporated rodeo and baseball and became associated with mainstream holidays such as the Fourth of July and Labor Day.

The Indian Reorganization Act of 1934 (IRA) is the centerpiece of New Deal policies affecting Indians that reversed what has been called the cultural ethnocide of former federal policies (Clemmer and Stewart 1986:546; Crum 1994:85). The IRA gave tribes the means to consolidate allotments and buy lands, organize councils with elected officials, and pursue economic development. Land-based tribal entities could pursue legal action to reclaim lost lands. Cultural pluralism and the revitalization of native customs, including language and religion, was another emphasis. The IRA generated three new Western Shosone tribal organizations: the Te-Moak Bands of Western Shoshone Indians, the Yomba Shoshone Tribe of the Yomba Reservation, and the Duckwater Shoshone Tribe of the Duckwater Reservation. However, most of the Western Shoshone widely dispersed throughout and adjacent to the study area remain unaffiliated, primarily because participation in the Te-Moak organization was perceived as compromising the position of those pursuing recognition of the government's obligation to meet the terms of the treaty of Ruby Valley.

Following World War II, post-war conservatism led to a new federal policy directed toward "preparing all Indians for termination of federal trust responsibility; abolishing reservations; and providing assistance to nuclear families, rather than to communities, to become integrated into the dominant society" (Clemmer and Stewart 1986:549). One component of termination was the creation of the Indian Claims Commission (ICC) in 1946. In short, the purpose was to settle and extinguish claims prior to termination. Only four Western Shoshone tribal organizations considered participating in submitting a claim – Duck Valley, Elko, South Fork and Battle Mountain, and Battle Mountain later withdrew its representative.

Many Western Shoshone boycotted the claims proceedings, perceiving another attempt to sidestep the treaty of Ruby Valley, and like the IRA had before, the ICC polarized traditionalists wanting to sue for entitlement and "New Dealers' who wanted to fund reservation-based economic development (Crum 1994:124). For the Western Shoshone, the legacy of the treaty of Ruby Valley is the definitive point of departure for consultation, collaboration, cooperation or negotiation over land management issues, exemplified by the vicissitudes and political fall-out of the *United States v. Mary and Carrie Dann.*

Traditional Resource Areas

The following information about the valleys in the project area identify resource areas and residential bases used most consistently by three to four nominal groups. These valleys provide a basis for identifying properties in the project area associated with some of the people and historic camps important in Western Shoshone history.

Crescent Valley

The White Knife Shoshone, the *tosawihi*, had winter camps north of Battle Mountain and along the Humboldt in the vicinity of Beowawe. These people had access to Crescent Valley, known for its seed resources, and sometimes wintered near Cortez or in Grass Valley. They could, with permission, gather seeds in Pine Valley, or pine nuts in the Roberts Mountains and visited Diamond Valley area and winter camps in the eastern foothills of the Sulphur Springs Range.

Pine and Diamond Valleys

People from Pine Valley were known as the *pasiatekka* (redtop grass-eaters). Their residential bases included a fishing village along the Humboldt River at Palisade where 56 people were recorded under the leadership of a Chief *Pit-si-nain* in 1872; *Bauwiyoi*, a group of at least 6 encampments at the foot of the north slopes of the Roberts Mountains and an important pine nut destination; *Tupagadu*, west of an alkalai flat in Diamond Valley along the eastern slopes of the Sulphur Springs Range also known as a fishing location and where spring and fall festivals were held with *Wovigunt* as director; and *Todzagadu* named for a medicinal plant, on the western side of the Sulfur Spring Range where 15 families of perhaps 90 individuals were scattered at springs a few miles apart. Pine nuts occurred most abundantly on the western slopes of the Sulphur Springs Range and the Roberts Mountains, with some in the Cortez Mountains.

Newark Valley

Ruby Valley people from Medicine Spring foraged seeds somewhere in Newark Valley (Steward 1938).

Long Valley and Butte Valley

Long Valley was called *Yogumba*, "flat," and was reported to be nearly devoid of water, except at the extreme north. Villages in both valleys in the north were visited by Ruby Valley people for antelope drives because both had antelope shamans.

Steptoe Valley and Ely Vicinity

Steptoe Valley was called *Bahanai*, the location of several villages, at Ely, and on Duck Creek, 8 miles north. Pine nut camps were located in the Egan and Shell Creek Ranges.

FINDINGS

The following sections describe the NRHP-eligible cultural resources identified in the project area resulting from the Class III survey, including: 1) prehistoric and historic archaeological resources, 2) historic ranches, 3) cultural resources near access roads, 4) TCPs, and 5) ethnohistoric properties.

Prehistoric and Historic Archaeological Resources

In total, 501 prehistoric and historic archaeological resources (excluding isolated finds) have been identified within the 500-foot-wide study corridor along the route alternatives (SEI 2000a). A summary of all sites listed by route alternative is provided in Table 3.16-1. A site-by-site summary list is provided in the cultural resources inventory (SEI 2000a). Of the 501 recorded sites, 236 were new prehistoric archaeological sites, 148 were new historic archaeological sites, and 76 sites contained both prehistoric and historic components. One new, modern mining site and a site of indeterminate date were also recorded. In addition, 233 isolated finds were recorded and 26 previously recorded sites were relocated

and re-recorded (SEI 2000a). Fourteen of these previously recorded sites were in parts of the corridors that were not surveyed due to restricted access or extreme topography. In addition, 15 previously recorded sites could not be relocated; these sites are not included in the record of known cultural resources.

Of the 501 recorded cultural resources, 26% (n= 131) were recommended significant and eligible for listing in the NRHP, 70% (n= 350) were recommended not significant, and 4% (n= 20) were unevaluated. Of the 131 resources recommended significant, 61% (n= 80) are prehistoric sites and 7% (n= 10) are historic sites. Thirty one percent (n= 41) of the significant sites contain both historic and prehistoric components. All but two of the combination sites are significant for their prehistoric components rather than their historic components.

As shown in Table 3.16-1, the highest number of significant and unevaluated sites (87) were identified in the Crescent Valley (a) and (b) route alternatives study corridor, while the lowest number of sites (70 and 69, respectively) were identified in the Pine Valley (a) and (b) alternatives route study corridors. The Buck Mountain route alternative falls in the middle with 77 significant and unevaluated sites identified in this study corridor. The distribution of site types across the Crescent Valley and Pine Valley route alternatives are approximately 50% prehistoric, 34% historic, 15% multicomponent, and 1% modern resources (or of unknown date). The Buck Mountain route alternative exhibits a slightly higher percentage of prehistoric sites (58%) over historic sites (24%). The percentage of sites recommended as significant resources was approximately 30% for each alternative route.

Prehistoric sites outnumber historic sites; they consist primarily of lithic debitage, tool scatters, and debitage scatters. Tool and debitage scatters contain fragments of stone implements, while debitage scatters are comprised only of stone waste flakes, a byproduct of tool-making. These two site types comprise 39% of all recorded sites. Complex prehistoric sites containing groundstone, pottery, and surface features and patterning are more rare (9%). Only three prehistoric sites did not contain debitage: a pot drop, a group of fire-cracked rock features, and a tool scatter. Other site types included quarries (n=11) and a single hunting blind with an associated lithic scatter.

TABLE 3.16-1: SUMMARY OF CULTURAL RESOURCE SITES BY ROUTE ALTERNATIVE

Route Alternative	BLM Field Office			Land Status			Site Type				Total	
	Battle Mountain	Elko	Ely	BLM	Private	Both	Prehistoric	Historic	Both (P/H)	Modern	Sites	Significant and Unevaluated Sites
Crescent Valley (a)	162	12	135	275	24	10	154	108	46	1	309	87*
Crescent Valley (b)	167	12	135	280	24	10	157	111	45	1	314	87*
Pine Valley (a)	87	33	135	232	12	10	122	92	39	1	254	70*
Pine Valley (b)	92	33	135	237	12	10	125	95	38	1	259	69*
Buck Mountain	10	62	178	230	12	8	145	60	44	1	250	77

Source: SEI 2000a

**Sites A-111 and 63-3134 are located on multiple routes (Segments F, G, and H); site 63-3134 is located on Segments G and H. The total number of sites has been tallied so that Sites A-111/63-3314 and 63-3134 were counted only once. Totals also include unevaluated sites, since these are treated as significant until determined eligible or not eligible. Site numbers may change after agency determination.*

The historic sites are dominated by historic roads/trails, some with associated debris scatters (16% of all sites), but trash scatters representing a variety of activities, wood cutting, shepherding, and more enigmatic scatters are also common (9.5% of all sites). Less common site types include transmission lines of various types, ranching-related sites, mining-related sites (including charcoal platforms and a carbonari camp), an historic townsite, and an historic railroad grade (the Eureka-Palisade Railroad). Several linear sites including segments of the Pony Express National Historic Trail, and other named and unnamed historic roads (including the Lincoln Highway and Hercules Gap Road) were also identified and evaluated. The Pony Express National Historic Trail was designated as a National Historic Trail by Congress in 1992 and may be eligible for the NRHP under Criteria A, B, C, and in some cases D. Other historic roads include the Hill Beachy Toll Road, which opened in 1869 between Elko and Hamilton in Newark Valley, and the Eureka-Palisade Road.

Sites containing both prehistoric and historic components consist of a wide variety of types, including lithic scatters and complex prehistoric sites, simple historic debris scatters, complex historic sites, and a wide variety of other types. Together, they comprise 16% of all sites.

Recommendations of eligibility would be reviewed by the BLM in each of the three field offices where the project is located. The BLM would make eligibility determinations, which would then be reviewed by the Nevada SHPO. As such, the total number of sites may change after BLM determinations and SHPO review.

Historic Ranches

Nine ranches over 50 years old were identified as potentially of historic value within 2 miles of the various alternative route segments. Of the nine ranches, surveyors were allowed access to four of these privately owned properties. The four ranches that were accessed include:

- **JD Ranch:** The JD Ranch is located in Pine Valley near the intersection of Segments B and D. Once the home of the prominent Eureka County stockman Joe Dean, the ranching complex consists of approximately 17 historic and 6 non-historic structures. Aside from the main residence with 1870s Italianate fenestration, the historic structures date mostly from the 1920s to the 1930s.
- **Hay Ranch:** The Hay Ranch is located on the old Lincoln Highway near Segment G. The ranch is linked to the historic era of the Eureka Mining District, providing beef, vegetables, and ice to miners since the 1860s. The ranch contains seven historic structures and numerous other outbuildings and landscape features integral to a working operation.
- **Pinto Creek Ranch:** This ranch is located north of Highway 50 in White Pine County just south of Segment I. The ranch complex contains several sod roof buildings of rubble construction. A pole barn, a company house moved from Ely, and several wooden shacks were augmented by later owners. Concrete cinder block garages and stables reflect the additions of 1950s landlords.
- **Warm Springs Ranch:** Warm Springs Ranch is located near Buck Mountain and Segment E. Historically, the ranch is connected to the operation of the Hill Beachey Toll Road. The ranch is part of a large corporation ranch. The main residence is a 1920s-1930s era company house moved from Ely. A railroad tie barn possibly indicates an earlier owner's expansion of the ranch. A quonset hut equipment structure indicates more recent additions to the complex.

None of the four ranches inventoried were evaluated for their historic significance. Complete documentation for historic properties eligible for the NRHP at the local or state level entails submission

of a report detailing the historic context and significance of the property by a qualified architectural historian, architectural and engineering plans, and photographs of the properties.

Cultural Resources Near Access Roads

Existing access roads (some of which would require improvements), a new centerline travel route, and new temporary spur roads would be used to construct and maintain the project. Most access roads for construction were analyzed for the existence of cultural resources during the literature search. All sites within 250 feet of an access road (or crossing the access road in the case of an historic road) were tallied, and a total of 310 sites were recorded in the project area. Of these, a total of approximately 136 cultural sites along all route segments are located near, or would be crossed by, access roads that may need improvements.

Table 3.16-2 identifies the number of cultural sites by route alternative that would be potentially affected by access road construction. Not all of these sites, however, are considered significant, nor have all of them been evaluated for significance. Table 6.17 in the Class III Cultural Resources Inventory (SEI 2000a) provides further information on recorded sites along potential access roads. Additional inventories would be conducted and site-specific analysis of this information, including impacts and mitigation measures for the preferred alternative route, will be provided in the HPTP and the COM Plan.

As shown in Table 3.16-2, the Crescent Valley (b) route alternative could affect the highest number of cultural sites due to road improvements (111). The Buck Mountain route alternative could affect the least (55), while the Pine Valley route alternatives (a) and (b) would fall in the middle (69 and 88, respectively).

TABLE 3.16-2: SUMMARY OF CULTURAL RESOURCE SITES NEAR ACCESS ROADS

Route Alternative	Number of Cultural Sites Potentially Affected by Access Road Improvements*
Crescent Valley (a)**	92
Crescent Valley (b)**	111
Pine Valley (a)	69
Pine Valley (b)	88
Buck Mountain	55

* *Not all of these sites are considered significant, nor have all of them been evaluated for significance.*

** *Includes L and K re-routes.*

Source: SEI 2000a

Traditional Cultural Properties and Ethnohistoric Sites

Nine ethnohistoric areas were identified for consideration as Traditional Cultural Properties (TCPs) during the ethnographic studies, interviews with tribal elders, and meetings with archaeological inventory participants and tribal representatives. They are all associated with one or more event, theme, or person important in Western Shoshone history. A sufficient amount of information was gathered to recommend three TCPs eligible for listing in the NRHP (SEI 2000b)[3]. All of these NRHP-eligible TCPs are located along the Crescent Valley route alternatives. One TCP was determined ineligible. Three TCPs in the study area remain unevaluated, but all unevaluated TCPs are considered eligible until a determination of significance has been made by the BLM in consultation with the Western Shoshone.

[3] The federal agencies involved have yet to make formal determinations of eligibility for these TCPs.

Two areas that incorporate archaeological remains are associated with events important in Western Shoshone history. Due to the confidential nature of these resources, none of these sensitive areas are described further in this document. The BLM retains the maps of these areas to protect the resources.

As shown in Table 3.16-3, the highest number of significant and unevaluated TCPs (5) would be located near the Crescent Valley route alternatives. The Pine Valley route alternatives would be located near 2 unevaluated TCPs. The Buck Mountain route alternative would be near 1 unevaluated TCP and 2 ethnohistoric areas.

TABLE 3.16-3: SUMMARY OF TCPS BY ROUTE ALTERNATIVE

Route Alternative	Number of Significant TCPs	Number of Unevaluated TCPs	Total
Crescent Valley (a)*	3	2	5
Crescent Valley (b)*	3	2	5
Pine Valley (a)	0	2	2
Pine Valley (b)	0	2	2
Buck Mountain	0	3	3

* *Includes L and K re-routes.*
Source: SEI 2000b

3.16.3 ENVIRONMENTAL CONSEQUENCES

This section summarizes the inventory findings of sites and features of cultural significance in the project area, including prehistoric and historic archaeological resources, and potential TCPs. This section also describes the potential direct and indirect impacts of the project on significant cultural resources. These potential impacts may relate to the entire corridor or to specific segments of the corridor, as discussed below.

SIGNIFICANCE CRITERIA

Project construction and operation activities would have a significant impact on cultural resources if they would:

- Directly or indirectly..."diminish the integrity of the property's location, design, setting, materials, workshop, feeling, or association." [36 CFR 800.9(b)]
- Otherwise directly or indirectly..."harm characteristics that qualify the property for inclusion in the National Register of Historic Places." [36 CFR 800.9(b)]

These criteria are in accordance with the directives of the State Protocol Agreement between the Nevada BLM and the Nevada SHPO for the assessment of adverse effects on historic properties, as defined in the regulations implementing Section 106 of the National Historic Preservation Act. The phrase "adverse effect" (as used in Section 106 consultation) and "significant impact" (as used in NEPA analysis) are not equivalent terms, but are similar in concept. In this document, an adverse effect that would occur to a resource deemed eligible for inclusion on the National Register of Historic Places (as determined by BLM in consultation with the SHPO) would be considered to be a significant impact under NEPA.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Project construction and operation would produce direct and indirect impacts to cultural resources. Impacts common to all route alternatives are discussed first, followed by an analysis of impacts that would be specific to each alternative.

Impacts Common to All Route Alternatives

Potential impacts to cultural resources that are common to all route alternatives include the following and are described in detail below.

- Direct impacts to prehistoric and historic sites.
- Discovery of unanticipated finds during construction.
- Discovery of human remains during construction.
- Visual impacts to cultural resources.
- Increased traffic and accessibility.
- Impacts to remaining unevaluated sites.
- Access roads impacts.

Direct Impacts to Prehistoric and Historic Sites

As shown in Table 3.16-1, prehistoric and historic sites eligible for listing in the NRHP are distributed throughout the project area. Direct impacts to prehistoric and historic sites, including surface or subsurface disturbance incurred during project construction, operation, or maintenance, could occur anywhere along the proposed route alternatives. Activities such as access road improvements; transmission line and substation construction, including foundations, tower pads, and guy wire anchor points; vegetation management; and material yards for construction equipment and personnel have the potential to disturb cultural resources eligible for listing in the NRHP. These impacts would most likely occur during the construction phase, although disturbance could potentially occur during operation and maintenance of the facility (e.g., emergency repairs).

The physical removal of brush and/or trees would primarily involve hydro-axing (using a type of mower machine), which does not typically result in subsurface impacts to prehistoric and historic archaeological resources. Surface impacts during this vegetative removal would most likely result from pnuematic tire pressure from vehicle traffic and could occur during the construction, operation, or maintenance phases.

Direct impacts would occur as a result of the construction of the transmission line; however, the individual sites cannot be precisely identified until the preferred route is selected, tower locations are determined, and detailed engineering plans are completed. In many cases, impacts can be minimized by strategic tower and facility placement and access restrictions. With these considerations, the following mitigation measures are recommended to reduce or eliminate direct construction-related impacts to NRHP-eligible cultural resources.

❑ ***Impact Cultural-1: Direct Impacts to NRHP-Eligible Sites***

Surface or subsurface disturbance incurred during construction, operation, or maintenance of the project could adversely impact NRHP-eligible sites.

❑ ***Mitigation Measure Cultural-1a***

Final design of the project (for example tower placement and access road locations) will include measures to avoid NRHP-eligible sites where feasible. The final list of sites to be avoided during construction will be specified in the Historic Properties Treatment Plan (HPTP) and the COM Plan, along with detailed measures to ensure this avoidance is implemented during construction

(such as flagging/fencing protocols and the establishment of site buffers). Sites that would be monitored, and procedures to implement this monitoring during construction, will also be provided in the HPTP and COM Plan. Temporary flagging or fencing would be implemented in consultation with the BLM on a case-by-case basis and in a manner that does not draw attention to a specific site location, and specified in the HPTP and COM Plan.

- ***Mitigation Measure Cultural-1b***

  An archaeological monitor will be retained during the construction phase of the project and will have the authority to halt construction activities in the immediate construction area if these activities disturb a site that has been identified for avoidance. An archaeological monitoring plan detailing this procedure will be provided in the HPTP and the COM Plan.

- ***Mitigation Measure Cultural-1c***

  If avoidance of NRHP-eligible sites is infeasible, treatment procedures such as archaeological data recovery, photo documentation, or other efforts (for example, creation of interpretive displays) would take place prior to the start of construction. These treatment measures would be determined on a site-by-site basis and established in the HPTP to be approved by the BLM and SHPO.

The objective of Mitigation Measures Cultural-1a and 1b is to ensure that cultural resources that are eligible for inclusion on the NRHP would not be adversely affected by the project. Specific sites identified for avoidance would be addressed in the HPTP and the COM Plan. Monitoring protocols to be set forth in the HPTP and the COM Plan would ensure compliance with the avoidance measures. Site monitoring would also occur in some instances to assess whether the mitigation measures were effective upon completion of construction.

Sites determined eligible to the NRHP, or that are unevaluated, would be treated as significant cultural resources (unless found not eligible to the NRHP by the BLM with concurrence by the SHPO). The preferred action is to avoid or reduce impacts to eligible sites, although some impacts may remain significant and unavoidable[4]. In the event 100% avoidance of such a site is not possible and it appears the project would have adverse effects, the BLM will implement site-specific steps necessary to reduce these impacts.

Typically, these steps would entail some form of treatment, ranging from surface collection, historic research, interpretive efforts, and/or archaeological excavation and analysis. This action is discussed in Mitigation Measure Cultural-1c. Such treatment efforts would be described in detail in the HPTP. For sites subject to data recovery, the most common approach to archaeological sites that are eligible to the NRHP as a result of their informational potential, the HPTP would outline the data potential of the property, present a research design and field and laboratory methods to be used in mitigation of the affected property, and make provision for the curation of artifacts recovered and for dissemination of the resulting report. Other treatment plans might involve detailed recording, archival research, or the development of public interpretation measures such as the placement of historic markers. Such treatment or data recovery plans would be developed and approved in consultation with representatives from the BLM and the SHPO.

The objective of mitigation through data recovery is to acquire substantive data relative to the research issues posited in the research design of the treatment plan. These data are intended to ameliorate the loss of information important to history or prehistory relative to the characteristics that rendered the site eligible for inclusion into the NRHP. Data recovery on most sites would consist of sample excavation.

[4] The BLM may determine that there is no way to eliminate an adverse effect to some sites eligible under Criteria A and B. In addition, data recovery does not completely eliminate impacts to sites eligible under Criterion D.

Only on very small sites would complete excavation be considered an appropriate treatment. Other forms of mitigation may also include the collection of oral histories, historical documentation, including architectural and engineering documentation, preparation of a scholarly work, or some form of public awareness or interpretation.

Discovery of Unanticipated Finds During Construction

Potential for the discovery of unanticipated cultural resources during construction exists along the entire construction corridor and could result in a direct impact.. Should such finds be discovered during construction, all potentially destructive activities will cease within the affected zone, and steps will be taken to protect the site from vandalism or further damage until such time as a BLM officer can be contacted to evaluate the nature of the discovery as outlined in the SPA. If possible, the resource would be avoided. Should avoidance prove infeasible, the resource would be evaluated and mitigation procedures would be determined by the BLM.

❑ ***Impact Cultural-2: Accidental Discovery of Cultural Resources***

Project construction involving subsurface excavation could adversely affect the integrity of previously undiscovered cultural resources anywhere in the project area.

❑ ***Mitigation Measure Cultural-2a***

Upon such discovery, all potentially destructive activities will cease within the affected area, and steps taken to protect the site from vandalism or further damage until a BLM officer can be contacted to evaluate the nature of the discovery. A buffer of 50 meters would be left around the discovery, and ground disturbing work would not resume until authorization was given by the officer. If possible, the resource should be avoided. The resource would be evaluated to determine whether or not avoidance is possible. If avoidance is possible, stabilization and measures to mitigate construction would also be required. If avoidance proves infeasible, appropriate mitigation procedures would be determined by the BLM and SHPO. The time factor for such procedures would be determined and specified in the COM Plan and HPTP.

Discovery of Human Remains During Construction

Another potential direct impact that could occur within any segment is disturbance to unanticipated and unmarked human remains that may be present in the construction area. Human remains found on federal lands are managed under the NAGPRA. Remains found on state and private lands are managed under Nevada law.

In the event that a human burial or suspected human burial is encountered during construction, work in its immediate area would be suspended. The BLM would be notified immediately, and a temporary 50-m diameter buffer around the discovery area would be flagged and protected from disturbance until a representative arrives at the site and issues further instructions, including establishment of an appropriate working buffer.

❑ ***Impact Cultural-3: Discovery of Human Remains***

Project construction involving subsurface excavation could adversely affect the integrity of an unmarked human burial site. Such sites, while not anticipated, may be discovered anywhere in the study corridor.

❑ ***Mitigation Measure Cultural-3***

Upon such discovery, all activities will cease within the affected zone, the BLM will be notified immediately, and a temporary 50-meter diameter buffer will be marked around the discovery area to protect it from disturbance. Work would not resume until permission was given by the officer. If the discovery is on federal lands, the BLM would manage such remains under the

direction of the NAGPRA. If the discovery is on state or private lands, the BLM would manage the remains under the directions of Nevada law concerning the protection of such findings.

Visual Impacts to Cultural Resources

Impacts to cultural resources along the entire project corridor may be caused by visual intrusions of the transmission line. The presence of any prominent feature, such as a large transmission line, introduced to the surroundings of an historic property may potentially create adverse impacts to such a property, if the characteristics which qualified the site for inclusion in the NRHP are affected (such as its historic setting or other characteristics). This is most likely to occur when the property qualifies for the National Register under Criteria A, B, or C, because these qualities cannot easily be mitigated through data recovery. Transmission lines, poles, substations, and permanent roads can undermine the historical impression that a cultural property can elicit to the viewer. In addition, project components can diminish the visually sensitive setting of important traditional cultural sites that may also be eligible for the NRHP.

In most cases, standard mitigation measures can be applied to reduce the project's visual impacts on these historic sites. For example, such mitigation measures may include: 1) tower spacing, 2) limited vegetation removal, 3) restriction of construction access in sensitive areas, 4) limiting ground disturbance at each tower location, 5) reclamation of access roads to pre-existing conditions, 6) use of non-specular conductors, 7) use of non-reflective neutral colors for the insulators, and 8) interpretive efforts if appropriate. In some cases, the impacts cannot be completely mitigated, constituting a significant, unavoidable visual impact. Some of the figures in Section 3.9 simulate the project's visual impacts to historic sites.

Several historic properties recorded in the inventory may be adversely affected by the presence of the transmission line. The following potential impacts are common to all route alternatives:

California Trail (Segment A)

The California National Historic Trail that brought many thousands of settlers, prospectors, and speculators to the Western United States runs along the Humboldt River and would be crossed just east of Dunphy by Segment A. This historic trail is eligible for the NRHP under Criteria A, B, and C, but at the point where the transmission line would cross the trail, no physical traces remain. This point is very near an elevated portion of Interstate 80, and the Western Pacific Railroad runs close to the assumed alignment of the original trail route. Since no trace of the original trail can be located at the point where the transmission line would cross the trail route and several transmission lines currently exist within the viewshed, no impact would be created by construction of the project. No other intact portions of the California Trail could be identified.

TCPs

Visual impacts to eligible and unevaluated TCPs are common to all route alternatives. Unevaluated TCPs are treated as if they were eligible until determined otherwise. The impacts and suggested mitigation measures related to the significant and unevaluated TCPs are described below:

- ***Impact Cultural-4: Visual Impacts to NRHP-eligible TCPs***

  The project may have significant adverse visual impacts on NRHP-eligible TCPs.

- ***Mitigation Measure Cultural-4a***

  If feasible, re-route portions of the transmission line to avoid potential visual impacts to eligible TCPs.

- ***Mitigation Measure Cultural-4b***

  For the NRHP-eligible TCP where boundaries have not been defined, the BLM would consult with the Western Shoshone to determine the most appropriate mitigation measures to reduce

visual impacts. As described in the State Protocol Agreement, consultation will be guided by BLM Manual 8160, *Native American Consultation and Coordination*, and BLM Handbook H-8160-1, *General Procedural Guidance for Native American Consultation.*

❑ ***Impact Cultural-5: Visual Impacts to Unevaluated TCPs***

The proposed project may have an adverse visual impact on unevaluated TCPs in the project area.

❑ ***Mitigation Measure Cultural-5***

The BLM will consult with the Western Shoshone to determine if there is sufficient information to locate the boundaries of the TCP, and to determine the most appropriate mitigation measures to reduce visual impacts. As described in the State Protocol Agreement, consultation will be guided by BLM Manual 8160, *Native American Consultation and Coordination*, and BLM Handbook H-8160-1, *General Procedural Guidance for Native American Consultation.*

Pony Express Trail

The Pony Express National Historic Trail is eligible for listing in the NRHP under Criteria A, B, and C. All route alternatives would traverse this historic trail at some point (i.e., Segments G, H, and E), creating a significant adverse visual impact to the trail's historic setting. The California-Oregon Trail Association gives this trail a Class 2 integrity rating for retention of its original location, association, and evoking the setting of 1860-1861. Similarly, the National Park Service identifies this portion of the trail as a "High Potential Segment," including "those portions of the 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" (NPS 2000). Finally, the BLM has classified this stretch of the Pony Express National Historic Trail as a Class II visual resource. The proposed transmission line and towers would be clearly visible from the trail at two of the three crossings, thus creating an adverse visual impact on the trail.

❑ ***Impact Cultural-6: Visual Impacts to the Pony Express National Historic Trail***

The proposed project would pass directly over the Pony Express National Historic Trail, creating an adverse visual impact to this National Register-eligible historic resource. The crossings in two locations (Segments E and H) are visually open, and the visual impacts are unavoidable. The third crossing (Segment G) would occur in a more visually concealed area, where the significant visual impact could be mitigated to some degree.

❑ ***Mitigation Measure Cultural-6a – Visually Open Areas (Segments E and H)***

The proposed project would traverse the trail in open areas relatively devoid of vegetation in the area of Segments E (see KOP 15, Figure 3.9-16, in Section 3.9, Visual Resources) and Segment H. The visual impacts to the Pony Express National Historic Trail cannot be totally mitigated in these areas. The impacts to the trail will be minimized, however, through strategic placement of poles, reclamation of access roads, revegetation, and minimization of tree cutting and trimming. An interpretive kiosk would also be constructed and maintained at Jacob's Well, a Pony Express Station located in Huntington Valley approximately 3.2 miles from Segment E. The site would offer an opportunity for public awareness of this historic property in a more accessible area than the other crossings, and would lessen additional change to the historic landscape. An interpretive kiosk or historic marker along Segment H may also be appropriate.

❑ ***Mitigation Measure Cultural-6b – Visually Concealed Areas (Segment G)***

Impacts to the Pony Express National Historic Trail can be mitigated at the Segment G crossing due to the heavily wooded location. Existing tree cover should be maintained to the greatest extent possible to screen the transmission line from view along Segment G (see KOP 19, Figure 3.9-20, in Section 3.9, Visual Resources). In addition, towers could be placed with maximum

and equal separation to the grade and nearby access road improvements could be returned to pre-existing conditions. During construction, travel between the two nearest towers could be restricted and/or the centerline travel route and spur roads located to minimize visual impact on the trail.

Eureka-Palisade Railroad

The Eureka-Palisade Railroad grade, which dates to 1875, is considered eligible for the National Register under Criterion A and possibly Criterion D. Segment C would be parallel the railroad grade for a distance of about 34 miles ranging between 0.6 and 2 miles (averaging approximately 1.5 miles) to the west of the proposed route. Judging from topographic maps and a series of photos taken from the grade toward the proposed transmission line route, it appears that the transmission line would be highly visible for approximately 30% of the 34-mile segment of the grade. The segment would be slightly visible for approximately 50% of the 34-mile stretch of the transmission line, and it is unlikely to be visible for 20% of the grade. Segment D would parallel the Eureka-Palisade Railroad for approximately 28 miles and would be visible for approximately 80% of the route, creating an adverse visual impact to this NRHP-eligible resource (see KOP 10, Figure 3.9-11 in the Visual Resources section). In total, Segments C and D would parallel the route for a total of 62 miles. Segment E would traverse the historic Eureka-Palisade Railroad grade (see KOP 12, Figure 3.9-13 in the Visual Resources section), as would Segment I. As a result, any of the route alternatives may create an adverse visual impact to the historic setting of this NRHP-eligible resource.

❑ ***Impact Cultural-7: Visual Impacts to the Historic Eureka-Palisade Railroad Grade***

The proposed project would be visible from the historic Eureka-Palisade Railroad grade, either by paralleling this resource for a number of miles, or by traversing it. Under either scenario, the proposed project would create an adverse visual impact to the historic setting of this NRHP-eligible resource.

❑ ***Mitigation Measure Cultural-7a – Parallel Segments (Segments C and D)***

The 62-mile stretch of the Eureka-Palisade Railroad grade will be thoroughly recorded using complete photographic recordation in the location of Segments C and D. Interpretive signs at two locations will be placed where the grade is visible from State Highway 278. Archival research and preparation of a final report will also be completed for a thorough recordation of the railroad. These measures will help reduce but not entirely mitigate the impact. Thus, this impact would be considered significant and unavoidable.

❑ ***Mitigation Measure Cultural-7b – Traversing Segments (Segments E and I)***

Design the crossing using normal height towers for maximum and equal separation to the grade, and reclaim all access roads to pre-existing conditions. In addition, consider appropriate landscaping techniques that may be used to reduce the visual impacts of the project.

Unevaluated Historic Ranches

The survey identified nine potentially historic ranches within 2 miles in the study corridor. The project may have an adverse visual impact to potentially historic ranches if these ranches are determined eligible for listing in the NRHP. Only four of these ranches were accessible during the survey inventory, and none of them have been evaluated for their historic significance by a professional architectural historian. These include JD Ranch in Pine Valley (Segment B), Hay Ranch (Segment G), Pinto Creek Ranch (Segment I), and Warm Springs Ranch (Segment E).

After selection of the preferred alternative, an effort should be made to evaluate the significance of those ranches which may be affected, and provide mitigation measures to avoid or reduce visual impacts to eligible properties.

❑ ***Impact Cultural-8: Visual Impacts to Unevaluated Historic Ranches***

If determined eligible, the project may create adverse visual impacts on unevaluated historic ranches along the proposed project. These include JD Ranch in Pine Valley (Segment B), Hay Ranch (Segment G), Pinto Creek Ranch (Segment I), and Warm Springs Ranch (Segment E).

❑ ***Mitigation Measure Cultural-8***

After selection of the preferred route, an architectural historian will evaluate the ranches that were recorded along the preferred route during the inventory for their historic significance. If determined ineligible, no further mitigation measures are needed. If determined eligible, measures to reduce the visual impact of the project would be included in the HPTP and the COM Plan. Transmission tower locations will be selectively sited along the proposed centerline to reduce the visual impacts to eligible ranches, within design constraints. For example, transmission towers can be located in more obscure locations relative to the view aspect of the ranch or main ranch buildings. In addition, landscaping could be used to reduce some visual impacts. Finally, other measures to reduce visual impacts could be in the form of archival research and gathering of oral histories.

The Lincoln Highway

The Lincoln Highway (US 50), which spans the width of Nevada, is eligible for the NRHP as an entire corridor. Certain remaining segments of this highway contribute to its overall significance, while others are non-contributing segments. Segments common to all route alternatives, specifically Segments G, H, I, and J would cross non-contributing segments of the Lincoln Highway. As a result, the project would have no significant adverse visual impact on the NRHP-eligible Lincoln Highway. No mitigation measures are required.

Hercules Gap Road

Hercules Gap Road appears to follow the route of an aboriginal trail through a steep-sided canyon just north of Ely in Steptoe Valley (Amme 1990). The road qualifies for inclusion on the NRHP under Criteria A, B, and possibly D. Segment J, which is common to all route alternatives, would not run through the canyon itself but would cross the historic road at a distance of about 450 meters to the south. An existing transmission line already crosses this area, and the area of the proposed crossing is considered to be a non-contributing element of the eligible property. However, the new transmission line may be visible from other eligible portions of the resource that could affect the setting, feeling, and association of the site and an adverse visual impact would ensue.

❑ ***Impact Cultural-9: Visual Impacts to Hercules Gap Road***

The project would cross the Hercules Gap Road along Segment J, creating an adverse visual impact to this NRHP-eligible resource.

❑ ***Mitigation Measure Cultural-9***

An historic interpretive sign will be placed at Hercules Gap Road explaining the historic and prehistoric importance of the road and the traditional cultural importance of the nearby distinctive rock formation.

Increased Traffic and Accessibility

Indirect impacts to cultural resources along the entire project corridor may be caused by increased traffic and accessibility. Increased visitation to now relatively isolated regions of Central Nevada could increase the potential for unauthorized collection and vandalism at significant archaeological sites. Such visits could occur before, during, or after construction of the transmission line. The study corridor may be visited during construction planning, during construction itself, or after construction in association with maintenance or recreation activities (all made easier by the improvement of existing access and

maintenance roads). Any unauthorized excavation or collection of artifacts at sites determined eligible for the NRHP would constitute a significant impact.

- ***Impact Cultural-10: Unauthorized Artifact Collection Due to Increased Traffic and Accessibility***

  Increased traffic and accessibility to the project corridor may increase the potential for unauthorized collection or vandalism at significant archaeological sites.

- ***Mitigation Measure Cultural-10a***

  An environmental compliance monitor will conduct pre-construction briefings to educate and train construction supervisors, managers, general foremen, and foremen about the regulations and penalties involving disturbance of archaeologically or culturally sensitive properties and about unauthorized collection of artifacts. This would also include signatory acknowledgement by all SPPC and contract personnel upon completion of the training. Due to the high turnover rate associated with construction crews, general foremen and foremen will be required to keep track of and train all construction personnel under their supervision of the regulations and penalties involving disturbance of archaeologically or culturally sensitive properties and unauthorized collection of artifacts. Training would involve multi-hour environmental education for personnel with the positions of foremen and above, and less than one-hour training sessions for the construction crew. The training would place the knowledge and responsibility with the leadership, and would require them to keep track of and train new project personnel under their supervision. If an employee or a contractor were caught collecting artifacts, SPPC would terminate that individual.

- ***Mitigation Measure Cultural-10b***

  During construction activities, exclusionary flagging or fencing will be used to protect sensitive areas. Also, the centerline travel route and new spur roads would be restricted or signage would be posted to discourage unauthorized vehicle access. After construction, new spur roads and portions of the centerline travel route leading to sensitive areas would be revegetated and reclaimed to preclude unauthorized overland vehicle access. Once these areas are closed, inspections of the lines by SPPC personnel would be conducted by the occasional use of ATVs or by helicopter.

The objective of these mitigation measures is to ensure that those cultural resources eligible for inclusion on the NRHP would not be subject to either deliberate or inadvertent disturbance, unauthorized collection by those associated with the construction and maintenance of the transmission line, or subsequent visitors to the area.

Impacts to Remaining Unevaluated Sites

In total, 20 sites identified during the survey process remain unevaluated either because their boundaries extended beyond the 500-foot study corridor, because they are located in areas previously surveyed, or because additional work will be needed to complete an evaluation of the site. The areas not surveyed are identified in Figure 3.16-1. These sites occur throughout the project area and include a number of prehistoric and historic sites. Six unevaluated sites are in the Mt. Hope area alone, which was not included in the 1999 survey.

As mentioned previously, all unevaluated sites would be treated as if eligible for the NRHP unless found ineligible by the BLM with concurrence by the SHPO. However, depending on the route that is chosen, many of these sites could fall outside of the project area on BLM lands. It is BLM policy to evaluate all sites within its territory for NRHP eligibility. The unevaluated sites will be revisited and evaluated after selection of the preferred alternative and prior to submission of the HPTP to the BLM and SHPO.

❑ ***Impact Cultural-11: Remaining Unevaluated Sites***

A number of unevaluated cultural resource sites exist both within and outside of the selected route alignment. These unevaluated sites may be eligible for the NRHP. It is BLM policy to evaluate all sites within its territory for NRHP eligibility, when feasible.

❑ ***Mitigation Measure Cultural-11***

Sites left unevaluated after selection of the preferred route will be further examined by the BLM, by way of field visits and/or archaeological testing. The methods and schedule for evaluating these sites may be included in the COM Plan. Testing would typically consist of 1 meter by 1 meter excavation units excavated in 10 cm levels to sterile soil. Information collected in the course of this project would be evaluated, and any sites determined through agency review to be eligible for the NRHP would be treated in accordance with the prepared treatment plan.

Access Road Impacts

Other potential direct and indirect impacts to cultural resources common to all route alternatives would stem from the improvement of access roads, construction of the centerline travel route, and new temporary spur roads. Direct impacts to cultural resources could result from construction-related disturbance (i.e., compaction of soils, subsurface disturbance, etc.), while indirect impacts could include unauthorized collection during construction or from increased accessibility through time. After the preferred route has been selected, the HPTP and the COM Plan would address site-specific impacts to cultural resources resulting from use of or improvements to access roads. The types of mitigation measures that could be used to reduce or eliminate the impacts of access road construction are listed below.

❑ ***Impact Cultural-12: Access Road Impacts***

Direct and indirect impacts to cultural resources may occur from access road improvements, centerline travel route construction, and new temporary spur roads in the project area.

❑ ***Mitigation Measure Cultural-12***

After selection of the preferred route, the HPTP and the COM Plan would contain an inventory and evaluation of sites near the access roads that may require improvements, the centerline travel route, and new temporary spur roads, and provide mitigation measures for potential impacts to cultural resources resulting from access roads. These could include:

(a) Inventory all access roads within a 200-foot corridor (100 feet on each side of the access road centerline), excluding areas previously surveyed in the 500-foot wide study corridor. Inventory efforts would occur only for non-paved access roads that may require improvements.

(b) Evaluate sites located during the inventory for NRHP eligibility.

(c) Prepare a Treatment Plan for all significant sites that would be directly affected by access road construction.

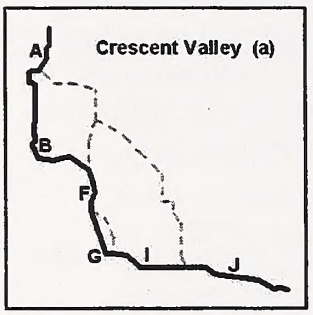
(d) Data recovery on 10% of sites that would receive indirect impacts as a result of increased vehiclular access will be used to mitigate for impacts to sites located along access roads proposed for improvement. To maximize the research potential of the study, sites along the access roads would be selected in combination with the sites selected for treatment along the preferred route.

Sites eligible under Criteria A, B, or C may also receive treatment, such as preparation of interpretive displays, additional archival research, etc.

Alternative-Specific Impacts

In addition to the impacts that would be common to all route alternatives, the following presents impacts that would be associated with specific route alternatives. Because each of the route alternatives differ by one or more segments, these alternative-specific impacts are best discussed in terms of their differentiating segments.

Crescent Valley Route Alternative (a)



The Crescent Valley route alternative (a) is comprised of Segments A, B, F, G, I , and J. In addition to the impacts common to all route alternatives discussed above (i.e., Impact Cultural 1-12), specific impacts for the Crescent Valley route alternative (a) are listed below by their general location (segment). The greatest concentration of cultural sites were identified in the study corridor of this route alternative (87 significant or unevaluated cultural sites – see Table 3.16-1). This alternative would also be located near a number of NRHP-eligible TCPs. These issues are discussed below by segment.

Segment B

The Crescent Valley route alternative (a) would pass by four NRHP-eligible TCPs. As described under Impact Cultural-4, the project may create visual impacts to these NRHP-eligible TCPs. If feasible, re-routing would be recommended to avoid three significant TCPs (Mitigation Measure Cultural 4a). For the remaining TCP, the BLM will consult with the Western Shoshone to determine if there is sufficient information to locate the boundaries of the TCP, and to determine the most appropriate mitigation measures to reduce visual impacts (Mitigation Measure Cultural 4b). As noted above, these TCPs are confidential in nature, and the BLM contains the maps of these areas to protect the resource.

Segment B would also be within 2 miles of the JD Ranch, which is potentially eligible for the NRHP upon further review. Segment B may have an adverse visual impact on this property if determined eligible. Mitigation measures for unevaluated historic ranches are provided in Mitigation Measure Cultural-8.

The following mitigation measure would apply if Segment B were used to construct the transmission line (this is a site-specific mitigation measure that is related to the previous Impact Cultural-2):

- ***Mitigation Measure Cultural-2b***

  Due to the relatively high probability that construction of Segment B may directly impact hidden, subsurface cultural resources in the Whirlwind Valley, all tower construction areas in the Whirlwind Valley would be tested for the presence of buried material through the use of test excavation units prior to the start of construction if either of the Crescent Valley routes were selected. These typically consist of 1 meter by 1 meter units excavated in 10 cm levels to sterile soil.

K re-route (along Segment B)

The K re-route has been proposed to avoid sensitive resources along Segment B. However, 5 cultural sites are within the 500-foot wide study corridor of the K re-route, and may be potentially affected by new access roads required to construct it. Three are historic, and two are a combination of both prehistoric and historic. Three of these sites are potentially eligible for the National Register. Mitigation Measure Cultural-1a, b, and c described above would apply to these potential direct impacts to NRHP-eligible sites.

L re-route (along Segment B)

The L re-route has been proposed to avoid sensitive resources along Segment B. However, six prehistoric sites are within the 500-foot wide study corridor of the L re-route. None of these sites are eligible for the National Register. As none of these sites are NRHP-eligible, no impacts to cultural resources are anticipated along the L re-route. No mitigation measures are required.

Segment F

Segment F would be constructed near an unevaluated TCP. Mitigation measures to protect unevaluated TCPs are described under Mitigation Measure Cultural-5.

Segment G

Segment G would cross the NRHP-eligible Pony Express National Historic Trail in a relatively wooded location (see KOP 19, Figure 3.9-20 in the Visual Resources section) where the significant visual impact could be mitigated through tower placement and/or other techniques, as described in Mitigation Measure Cultural-6b. Segment G would also cross the NRHP-eligible Lincoln Highway. Segment G would cross a non-contributing segment of this highway. As a result, Segment G would have no adverse visual impact to the NRHP-eligible Lincoln Highway. No mitigation measures are required.

Segment G would also pass within 2 miles of the Hay Ranch, a potentially significant historic ranch located on the old Lincoln Highway. Segment G may have an adverse visual impact on this property if determined eligible for listing in the NRHP. Complete documentation regarding this property's significance would be required for mitigation of eligible ranches affected by the project. Mitigation measures for unevaluated historic ranches are described in Mitigation Measure Cultural-8.

Segment G would also be constructed near an unevaluated TCP. As discussed previously, mitigation measures to protect unevaluated TCPs are described under Mitigation Measure Cultural-5.

Segment I

Segment I, common to the Crescent Valley and Pine Valley route alternatives, would cross the historic Eureka-Palisade Railroad grade, considered eligible for the NRHP under Criterion A and possibly D. The location where the route would cross the grade is in a canyon adjacent to a segment of the Eureka-Palisade Railroad and an historic telephone line (see KOP 24, Figure 3.9-25 in the Visual Resources section). However, three previous transmission lines cross the canyon overhead, somewhat diminishing the setting of the railroad, the telegraph line, and the historic road[5]. One of these lines is visible in the background of KOP 24. An additional transmission line would add to the existing impacts to the setting, but the new line would span the canyon, somewhat limiting the visual impacts to the historic resource located at the bottom of the canyon. Nevertheless, Segment I may create an adverse visual impact to this NRHP-eligible resource. The proposed mitigation measures to reduce visual impacts to the Eureka-Palisade Railroad are described under Mitigation Measure Cultural-7b.

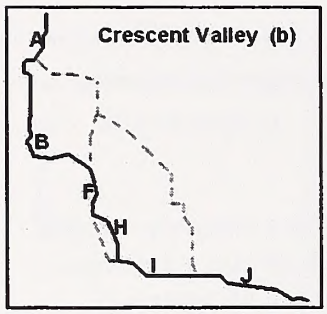
Segment I would also cross the NRHP-eligible Lincoln Highway. Segment I would cross a non-contributing segment of this highway. As a result, Segment I would have no adverse visual impact to the NRHP-eligible Lincoln Highway. No mitigation measures are required.

Segment I would pass within 2 miles of the Pinto Creek Ranch, located north of Highway 50 in White Pine County. Segment I may have an adverse visual impact on this property if determined eligible for listing in the NRHP. Complete documentation regarding this property's significance would be required for mitigation of eligible historic ranches affected by the project. Even if the Pinto Creek Ranch were determined eligible, the viewshed has been previously disturbed by construction of other transmission

[5] These existing transmission lines include one SPPC 230 kV line and two Mt. Wheeler Transmission lines (one 60 kV and another 25 kV).

lines. In addition, the project would be less intrusive than the exiting transmission lines, since they would be constructed on the opposite (north) side of these lines. Mitigation measures for unevaluated historic ranches are described in Mitigation Measure Cultural-8.

Crescent Valley (b) Route Alternative



The Crescent Valley (b) route alternative is comprised of Segments A, B, F, H, I, and J. It follows a nearly identical alignment with the Crescent Valley (a) route, except that it uses Segment H rather than Segment G, traversing the east side of Whistler Mountain rather than the west. The Crescent Valley (b) route shares the impacts common to all route alternatives (i.e., Impact Cultural-1 through -12) and the impacts associated with Crescent Valley (a) route, except it would avoid impacts associated with Segment G (discussed above), and would create other impacts on Segment H (described below). The same number of cultural sites were identified in the study corridor of this route alternative as the Crescent Valley (a) route alternative (87 significant or unevaluated cultural sites – see Table 3.16-1).

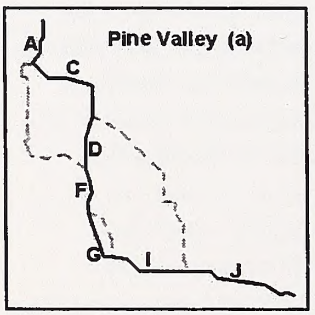
Segment H

Segment H would cross the NRHP-eligible Pony Express National Historic Trail in a relatively open area (see KOP 21, Figure 3.9-22, in the Visual Resources section). The proposed transmission line and towers would be visible from the trail, thus creating an adverse visual impact that cannot be completely mitigated. The impacts to the trail can be minimized, however, through strategic placement of poles, reclamation of access roads, revegetation, minimization of tree cutting and trimming, and interpretive efforts (see Mitigation Measure Cultural-6a).

Segment H would also cross the Lincoln Highway (State Highway 50). Segment H would cross one of the non-contributing segments to this highway. As a result, Segment H would have no adverse visual impact to the NRHP-eligible Lincoln Highway. No mitigation measures are required.

Segment H would also be constructed near an unevaluated TCP. As discussed previously, mitigation measures to protect unevaluated TCPs are described under Mitigation Measure Cultural-5.

Pine Valley (a) Route Alternative



The Pine Valley (a) route alternative is comprised of Segments A, C, D, F, G, I, and J. It follows a similar alignment to the Crescent Valley (a) route, except that it uses Segments C and D instead of Segment B. In addition to the impacts common to all route alternatives described previously (i.e., Impact Cultural-1 through -12), the Pine Valley (a) route would involve other impacts to cultural resources along Segments C and D, as described below. The second lowest concentration of cultural sites were identified in the study corridor of this route alternative (70 significant or unevaluated cultural sites – see Table 3.16-1).

Segment C

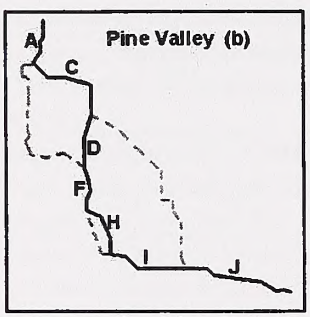
Segment C would parallel the NRHP-eligible Eureka-Palisade Railroad for approximately 34 miles, and would be visible for approximately 80% of the route, creating a significant adverse visual impact to this NRHP-eligible resource (see KOP 10, Figure 3.9-11 in the Visual Resources section). Mitigation measures suggested to reduce the visual impact to this historic site include the installation of interpretive signs at two locations where the grade is visible from State Highway 278, archival research, and preparation of a final report (see Mitigation Measure Cultural-7a). While these measures would help reduce the level of impact, they would not fully mitigate it. Thus, the visual impact to the Eureka-Palisade Railroad grade along segments C and D is considered a significant and unavoidable impact.

Segment C would also be constructed near an unevaluated TCP, which may have an adverse visual impact on this resource. Mitigation measures to protect unevaluated TCPs are described under Mitigation Measure Cultural-5.

Segment D

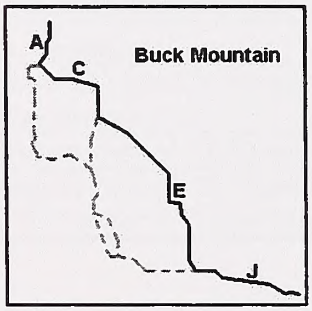
Segment D would also parallel the Eureka-Palisade Railroad for approximately 28 miles and would be visible for approximately 80% of the route, creating an adverse visual impact to this NRHP-eligible resource. Segments C and D would parallel the route for a total of 62 miles. Mitigation measures for Segment D are the same as for Segment C described above (see Mitigation Measure Cultural-7a). They would not completely mitigate the impact, however. Thus, the visual impact to the Eureka-Palisade Railroad grade along segments C and D is considered a significant and unavoidable impact.

Pine Valley (b) Route Alternative



The Pine Valley (b) route alternative is comprised of Segments A, C, D, F, H, I, and J. It follows a nearly identical alignment with the Pine Valley (a) route, except that Pine Valley (b) uses Segment H rather than Segment G, traversing the eastern side of Whistler Mountain rather than the west. The Pine Valley (b) route alternative would have largely the same impacts as Pine Valley (a) route, except the transmission line would cross the Pony Express Trail in a relatively open area, which would be highly visible and could not be easily mitigated. Impacts of the transmission line in the area of Segment H, and proposed mitigation measures to reduce the visual impact, are described above under the Crescent Valley (b) route alternative (Segment H – Mitigation Measure 6a). The lowest concentration of cultural sites were identified in the study corridor of this route alternative (69 significant or unevaluated cultural sites – see Table 3.16-1).

Buck Mountain Route Alternative



The Buck Mountain route alternative is comprised of Segments A, C, E, and J. It shares the impacts common to all route alternatives (Cultural Impact-1 through-12). Buck Mountain is the only route that uses Segment E, which would also cross the Pony Express Trail and the Eureka-Palisade Railroad grade. Approximately 132 cultural sites were identified along the study corridor of Segment E, 40 of which are significant or unevaluated. This segment has a higher number of significant and unevaluated sites than any other segment, largely due to its length, and the relatively remote and pristine area it would traverse. This segment would also traverse near an unevaluated TCP, and would cross the NRHP-eligible Hill Beachey Toll Road. These issues are described below.

Segment E

Segment E would cross over the historic Eureka-Palisade Railroad grade, considered eligible for the NRHP under Criterion A and possibly D (see KOP 12, Figure 3.9-13 in the Visual Resources section). As a result, Segment E may create an adverse visual impact to the historic setting of this NRHP-eligible resource. As described in Mitigation Measure Cultural 7b, the towers will use normal height towers for maximum and equal separation to the grade, and all access roads will be reclaimed to pre-existing conditions.

Segment E would also be constructed near an unevaluated TCP, which may have an adverse visual impact to this resource. Mitigation measures to protect unevaluated TCPs are described under Mitigation Measure Cultural-5.

Segment E would be located approximately 0.25 mile from the Warm Springs Ranch located near Buck Mountain. Segment E may have an adverse visual impact on this property if determined eligible for listing in the NRHP. Mitigation measures for all unevaluated historic ranches are discussed under Mitigation Measure Cultural-8

Segment E would also cross the Hill Beachey Toll Road, which is considered eligible under Criteria A and B. The segment may have an adverse visual impact on this historic toll road.

❑ ***Impact Cultural-13: Visual Impacts to the Hill Beachey Toll Road***

If selected, Segment E would traverse the historic Hill Beachey Toll Road, creating a potentially adverse visual impact to this NRHP-eligible resource.

❑ ***Mitigation Measure Cultural-13***

To mitigate visual impacts, an interpretive sign will be placed at the toll road crossing which describes the history and importance of the road to the regional transportation network.

Summary Comparison of Route Alternatives

Table 3.16-4 summarizes the impacts by route alternative.

TABLE 3.16-4: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Cultural-1: Direct Impacts to NRHP-Eligible Sites	X	X	X	X	X
Impact Cultural-2: Accidental Discovery of Cultural Resources	X	X	X	X	X
Impact Cultural-3: Discovery of Human Remains	X	X	X	X	X
Impact Cultural-4: Visual Impacts to NRHP-eligible TCPs (Segment B)	X	X			
Impact Cultural-5: Visual Impacts to Unevaluated TCPs (Segments C, F, G, H, and E)			X	X	X
Impact Cultural:-6: : Visual Impacts to the Pony Express National Historic Trail (Segments G, H, and E)	X	X	X	X	X
Impact Cultural-7: Visual Impacts to the Eureka-Palisade Railroad (Segments C, D, E, and I)	X	X	X	X	X
Impact Cultural-8: Visual Impacts to Unevaluated Historic Ranches (Segments B, E, G, and I)	X	X	X	X	X
Impact Cultural-9: Visual Impacts to Hercules Gate Road (Segment J)	X	X	X	X	X
Impact Cultural-10 : Unauthorized Artifact Collection Due to Increased Traffic and Accessibility	X	X	X	X	X
Impact Cultural-11: Remaining Unevaluated Sites	X	X	X	X	X
Impact Cultural-12: Access Road Impacts	X	X	X	X	X
Impact Cultural-13: Visual Impacts to the Hill Beachey Toll Road (Segment E)					X

RESIDUAL IMPACTS

After mitigation, there may be minor residual impacts to cultural resources, depending on the selected route alternative and the number of eligible sites in the path of that route. After selection of the preferred route and final design (i.e., tower placement, centerline route, etc.), the residual impacts to cultural resources will be more clear. For example, one residual impact may be the unavoidable visual impacts of the transmission line on the NRHP-eligible Pony Express Trail at the crossings of Segments H and E. If selected, the Pine Valley (b) route alternative would likely have a continuing visual intrusion upon this trail and a permanent reduction of its historic setting, as these impacts cannot be completely mitigated (see Impact Cultural-6). Similarly, the Buck Mountain route alternative would have a residual effect on this trail if it is selected.

As mentioned above, a detailed COM Plan will be completed after the selection of the preferred alternative, providing site-specific mitigation measures for those cultural resources potentially affected by

the construction, operation, and maintenance of the project. The COM Plan would also contain monitoring protocols to ensure compliance with the mitigation measures. While avoidance is the preferred mitigation measure, avoidance will not always be feasible due to engineering constraints, topography, or other conditions. An HPTP describing site-specific mitigation measures for impacts to historic properties will be completed and submitted to the BLM and the Nevada SHPO for their review and approval prior to construction. Depending on the resource type affected, interested Native American tribes may also be consulted regarding the COM Plan and the HPTP. However, the BLM would make the final approval of these treatment plans. Both the COM Plan and the HPTP will be used to apply the approved mitigation measures and to reduce residual impacts to the greatest extent possible.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to cultural resources associated with this project would be avoided. However, cultural resource impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

3.17 PALEONTOLOGICAL RESOURCES

This section provides an overview of the paleontological resources in the project area. Specifically, this section describes the area of analysis and the regulatory setting, defines paleontological resources, and describes the inventory methods. This section also analyzes potential project impacts and mitigation measures.

3.17.1 AREA OF ANALYSIS AND METHODOLOGY

A paleontological characterization report completed for the project (Firby 1999) encompassed a 500-foot wide study corridor along 345 miles of the route alternatives. Paleontological resources are fossilized remains of multicellular invertebrate and vertebrate animals and multicellular plants, including imprints thereof (36 CFR 261.2). Fossilized remains are any non-manufactured evidence of prehistoric life, including skeletal remains, impressions of these remains, or their chemical signatures (personal communication with Dr. James Firby, April 11, 2000). The significance of paleontological resources is subjectively ranked based on the presumed scientific value of proven fossil content. For example, vertebrate fossils are typically both less common and less abundant than invertebrate fossils, and are usually (but not always) rated as more significant. Exceptions are common, however, as in the case of well-preserved soft-bodied organisms such as worms, insects, and spiders, or in the case of rare invertebrate fossils, which have a unique occurrence.

METHODOLOGY

A summary of the inventory methods related paleontological resources in the study corridor and surrounding region is provided below. The inventory methods are organized in terms of literature searches and field surveys, as described below.

Literature Search

Existing literature on the geology and paleontology 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. Prime sources used in the literature review were computerized databases such as GEOREF, which include articles in scientific journals as recent as the last 6 months, as well as the investigators' personal knowledge of the area's literature accumulated over a combined 70 years of experience. Locality databases from institutions such as the Keck Museum of the Mackay School of Mines, University of Nevada Reno, University of California Museum of Paleontology, and published localities of the USGS were consulted as necessary. Areas with high and moderate paleontological potential were then ranked for significance. The ranking of significance potential was based on the experience of the evaluating paleontologist with the type of geologic deposit, familiarity with the specific deposit, and the literature referring to that deposit.

Field Survey

Geologic formations in the study corridor with moderate to high paleontological potential and significance were examined in the field from July 19 through July 23, 1999 by Dr. James Firby. The field survey also confirmed the existence of certain important geological units.

REGULATORY FRAMEWORK

Code of Federal Regulations

The BLM manages paleontological resources under a number of federal regulations. Principally, paleontological resources on BLM lands are protected under Title 43, Subpart 8365.1-5 of the Code of Federal Regulations, which prohibits the willful disturbance, removal, and destruction of scientific resources or natural objects. Subpart 8360.0-7 identifies the penalties for such violations.

Federal Land Policy and Management Act

In addition, the Federal Land Policy and Management Act of 1976 (P.L. 94-579) requires that the 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 which is 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 the BLM Manual 8720 (BLM 1998). The specific objectives of this program are to:

- Locate, evaluate, manage, and protect, where appropriate, paleontological resources on public lands.
- Facilitate the appropriate scientific, educational, and recreational uses of paleontological resources, such as research and interpretation.
- Ensure that proposed land uses, initiated or authorized by BLM, do not inadvertently damage or destroy important paleontological resources on public lands.
- Foster public awareness and appreciation of our nation's rich paleontological heritage.

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).

3.17.2 AFFECTED ENVIRONMENT

The setting for paleontological resources is defined by the geologic setting of a given area through geologic time. These geologic units are also called "lithostratigraphic units," which are rock formations, beds, groups, and informal units assigned to a stratigraphic horizon and lithotype. Lithostratigraphic units in the study corridor that would be crossed by the project right-of-way, or are close enough to the surface to be potentially disturbed by construction activities, are listed in Table 3.17-1, along with a ranking of paleontological potential and significance. Additional information regarding each unit is available in the paleontological characterization report (Firby 1999).

As shown in Table 3.17-1, only the Undivided Quaternary and Late Tertiary sediments (Qtsu) in the project area contain both high paleontological potential and significance. Undivided Quaternary and Late Tertiary sediments are variously assigned to the Carlin and Hay Ranch formations located primarily in Pine Valley. This formation is primarily made of sandstone, vitric tuff, limestone, and siltstone.

The Hay Ranch Formation is equivalent to the Humboldt Formation, and is used here as a lateral equivalent. The Hay Ranch (Humboldt) Formation is known to contain fossil mammals, plants, and invertebrates. Wherever encountered, Qtsu must be considered to have a high degree of both potential

and significance for paleontological resources (Firby 1999). This formation occurrence in the study corridor is shown in Figure 3.17-2.

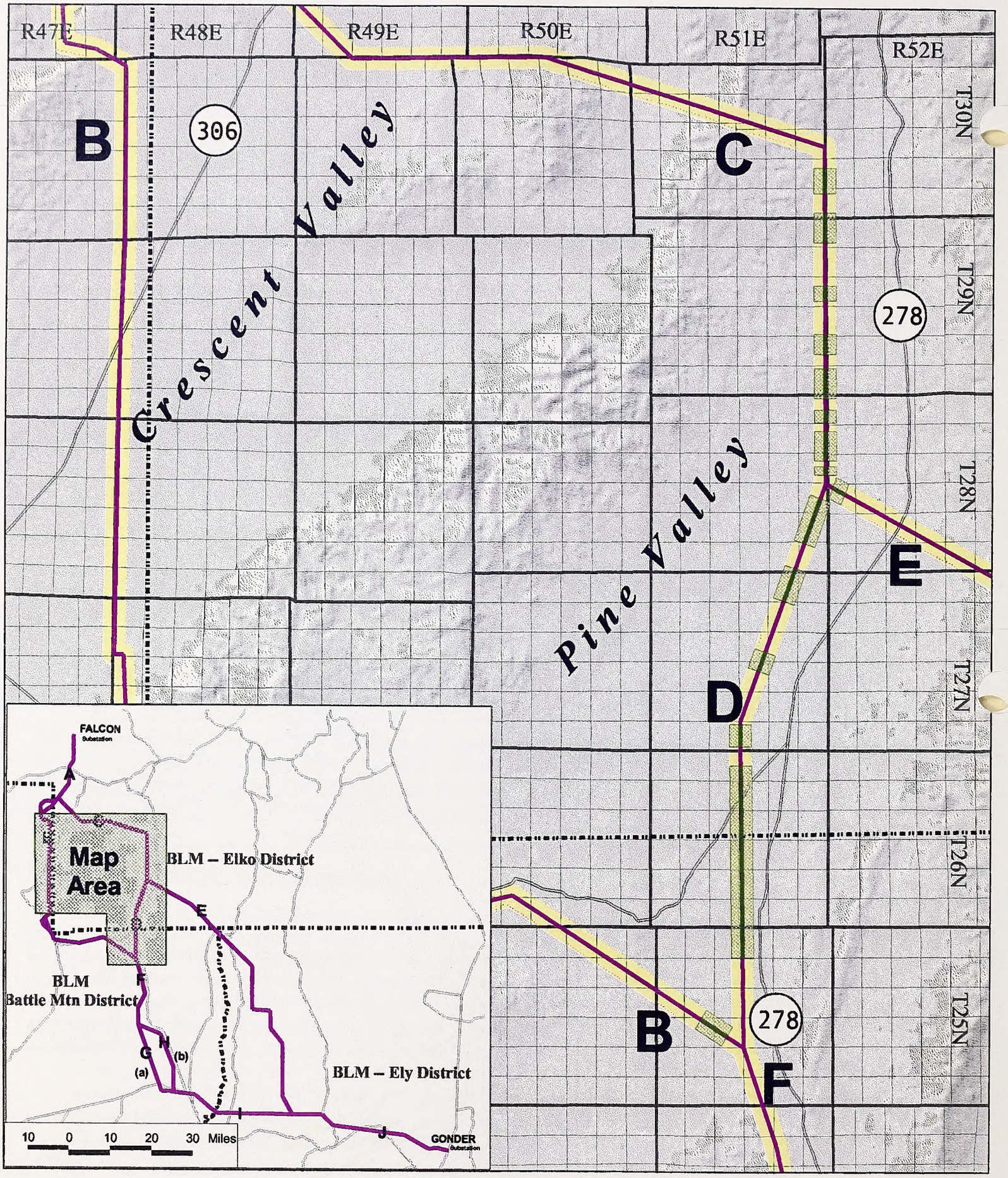
TABLE 3.17-1: GEOLOGIC FORMATIONS IN THE PROJECT AREA RANKED BY PALEONTOLOGICAL POTENTIAL AND SIGNIFICANCE

Formation Name and Scientific Abbreviation	Paleontological Potential	Significance Potential
Quaternary and Tertiary Units (65 million years ago to present day)		
Playa deposits (Qp)	Low	Low
Quaternary alluvium (Qa, Qs, Qal)	Low	Low
Older Quaternary sediments (Qoa)	Low	Low
Undivided Quaternary and Late Tertiary sediments (Qtsu)	High	High
Tertiary gravels (Tg)	Low	Low
Undifferentiated younger sediments (Tys)	Moderate	High
Undivided Tertiary Volcanic Rocks (Tvu)	Low	Low
Tertiary andesite and basalt (Ta2)	Low	Low
Mesozoic Units (65 million – 200 million years ago)		
Newark Canyon Formation (Kn)	Low	Low
Jurassic and Cretaceous volcanic rocks (KJv)	Low	Low
Jurassic granites (Jg)	Low	Low
Paleozoic Units (200 million - 500 million years ago)		
Garden Valley Formation (Pg)	Moderate	Low
Riepe Spring Formation (PIP)	Moderate	Low
Diamond Peak Formation (IPMdp, Md)	Moderate	Low
Mississippian Chainman Shale (Mc, MD)	Moderate	Low
Undivided Mississippian sedimentary rocks (Mu)	Low	Low
Devonian (Dd, Dn, Dl)	Moderate	Low
Middle to Upper Devonian Slaven Chert (Ds)	Low	Low
Early and Middle Ordovician rocks (Ovi, Ov)	Moderate	Low

Source: Firby 1999.

Paleontological Resources Survey Results

A review of the literature and fossil databases did not reveal any recorded fossil localities within the project area. Lithostratigraphic units within the project area range in age from Quaternary to Middle Ordovician. While most of the older units are known to contain fossils, those resources are not believed to have a high degree of significance, except for the Hay Ranch (Humboldt) Formation, which is known to contain significant fossil mammals, invertebrates, and plants. The Hay Ranch (Humboldt) Formation would be crossed by Segments B, C, D, and E. This unit, rated as high for both paleontological potential and significance, was examined in the field as part of this investigation. While no fossils were found during this examination in 1999, there exists the potential for fossils to be discovered during the course of construction. For example, a BLM archaeologist discovered fossilized vertebra of a large mammal at the western end of Segment E in fall 2000.



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Source: Firby 1999

Geologic Formations Potentially Containing Significant Paleontological Resources

4 0 4 Miles

Scale 1 : 253,440
(1" = 4 miles)

QTsu (Undivided Quarternary and Late Tertiary sediments) Hay Ranch Formations

Figure 3.17 - 1

3.17.3 ENVIRONMENTAL CONSEQUENCES

This section describes the potential direct and indirect impacts of the project on significant paleontological resources, as well as mitigation measures to reduce or eliminate these potential impacts.

SIGNIFICANCE CRITERIA

Project construction and operation activities would have a significant impact on paleontological resources if they would:

- Substantially compromise a significant paleontological site's scientific and educational values.

IMPACTS COMMON TO ALL ROUTE ALTERNATIVES

Potential for the discovery of significant paleontological resources is high where all route alternatives would cross Undivided Quaternary and Late Tertiary Sediments (Qtsu), also known as Hay Ranch Formation (see Figure 3.17-2). Disturbance of the surface of the Hay Ranch Formation could possibly damage subsurface fossils that may be present. Portions of Segments B, C, D, and E specifically cross the Hay Ranch Formation.

❑ ***Impact Paleontological-1: Potential Discovery of Significant Paleontological Resources***
Subsurface excavation along the portions of Segments B, C, D, and E, which cross the Hay Ranch Formation, may adversely affect significant paleontological resources if present in the construction area.

❑ ***Mitigation Measure Paleontological-1***
The portions of Segments B, C, D, and E that cross the Hay Ranch Formation shall be: (1) monitored during construction by a paleontologist who meets Nevada BLM qualifications; (2) if paleontological resources are discovered during construction, the BLM would be notified immediately and measures taken to protect the resource. A buffer of 50 meters would be left around any discovery and work would not resume until authorization was given by an authorized officer. The significance of the resource would be evaluated and whether or not avoidance was possible. Stabilization and measures to mitigate construction damage might also be required even if avoidance is possible. Should avoidance prove unfeasible, further mitigation procedures to protect the resource would be determined by the BLM.

Summary Comparison of Route Alternatives

TABLE 3.17-2: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Paleontological-1: Potential Discovery of Significant Paleontological Resources	X	X	X	X	X

RESIDUAL IMPACTS

After mitigation, there may be minor residual impacts to paleontological resources, depending on the selected route alternative and the number of eligible sites in the path of that route. After selection of the preferred route and final design (i.e., tower placement, centerline route, etc.), the residual impacts to paleontological resources will be more clear.

As mentioned above, a detailed COM Plan would be completed after the selection of the preferred alternative, providing site-specific mitigation measures for those resources potentially affected by the construction, operation, and maintenance of the project. The COM Plan would also contain monitoring protocols to ensure compliance with the mitigation measures.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to paleontological resources associated with the project would be avoided. However, paleontological resource impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

3.18 ENVIRONMENTAL JUSTICE

In February 1994, Executive Order 12898 was signed requiring all federal agencies to seek to achieve environmental justice by "... identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations." This section provides an overview of minority and low-income populations in the project area, and addresses potential effects that the project may have on these populations.

3.18.1 AREA OF ANALYSIS AND METHODOLOGY

The study areas for environmental justice include identified minority or low-income populations likely to be affected by the project within Elko, Eureka, Lander, and White Pine counties. County-level statistics on minority or low-income populations were gathered primarily from the Nevada State Demographer and the U.S. Bureau of Census. Statistics on Native American populations in the project area were obtained primarily from the Bureau of Indian Affairs (BIA).

REGULATORY FRAMEWORK

Executive Order 12898

As explained above, Executive Order 12898 directs federal agencies to analyze environmental justice issues that could be involved in relation to a federal action (e.g., in this case, the action would be BLM's approval of SPPC's right-of-way grant application and the RMP amendments).

3.18.2 AFFECTED ENVIRONMENT

This section provides an overview of minorities and low-income populations in the project area. The distribution of all races, including minority populations residing in the four-county project area and in the State of Nevada, is shown in Table 3.18-1. The demographic information presented was compiled from the Nevada State Demographer using 1997 population estimates. Minority populations in the four-county project area include African American, American Indian, Asian/Pacific Islander, and Hispanics. Persons of Hispanic origin may be of any race and are counted in the other racial categories.

TABLE 3.18-1: POPULATION CHARACTERISTICS OF NEVADA COUNTIES (1997 ESTIMATES)

Race	COUNTY				
	Elko	Eureka	Lander	White Pine	Nevada
White	43,570 (91%)	1,595 (96.1%)	6,638 (94.4%)	10,001 (94%)	1,558,629 (88%)
African American	364 (0.8%)	5 (0.3%)	10 (0.1%)	210 (2%)	131,323 (7%)
American Indian	3,387 (7%)	48 (3%)	366 (5%)	391 (4%)	31,366 (2%)
Asian/Pacific Islander	390 (0.6%)	12 (0.7%)	18 (0.3%)	39 (0.4%)	58,532 (3%)
Total	**47,710**	**1,660**	**7,030**	**10,640**	**1,779,850**
Hispanic Origin*	7,143 (15%)	160 (10%)	1,001 (14%)	1,066 (10%)	225,621 (13%)

** Hispanic origin indicates an ethnicity, not a race, explaining the discrepancy in percentages*
Source: Nevada State Demographer 1998

In Elko County, with a total 1997 population estimate of 47,710, the largest minority population is those of Hispanic origin, comprising 15% of the population. Native Americans comprise the second largest minority group, with 7% of the population. In Eureka County, with a total 1997 population estimate of 1,660, the largest minority population is those of Hispanic origin, with 10% of the population. Native

Americans comprise the second largest minority group, with 3% of the population. Lander and White Pine counties display similar population characteristics, with those of Hispanic origin and Native Americans forming the largest and the second largest minority populations, respectively. Compared with the State of Nevada as a whole, the four-county region has a slightly lower number of Hispanics, yet a slightly higher number of Native Americans. After Hispanics, African Americans make up the second largest minority population in the state, yet African Americans form a much smaller percentage of the population in the four-county project area.

The U.S. Bureau of Economic Analysis provides information on per capita income in the four-county project area and ranks counties for comparison within the State of Nevada. As shown in Table 3.18-2, residents of White Pine County have the lowest per capita income of the four-county region. The residents of this county also have the second lowest per capita income in the state of Nevada (ranked 16 out of 17 counties). Elko, Eureka, and Lander counties have slightly higher per capita incomes and rank near the middle of all counties in the state.

TABLE 3.18-2: PER CAPITA MEDIAN INCOME BY COUNTY (1997)

Area	Per Capita Income (Dollars)	State Ranking (out of 17 counties)
Elko	22,333	7
Eureka	21,961	8
Lander	20,985	10
White Pine	18,510	16
Nevada	26,514	-

Source: U.S. Department of Commerce. Bureau of Economic Analysis 1999

According to the U.S. Census, low-income persons are defined as those living in households that reported an annual income less than the United State official poverty level. The poverty level varies by size and relationship of the members of the household. In 1995, the poverty level for a family of four was $15,500 (U.S. Census 1995). Table 3.18-3 provides 1995 information related to poverty for people of all ages within the four-county project region and compares them with the State of Nevada. As shown in Table 3.18-3, White Pine County had the highest percentage of people living in poverty (11%) of the four-county region. This figure is the same, however, as the percentage of people living in poverty in the State of Nevada.

TABLE 3.18-3: COUNTY ESTIMATES FOR PEOPLE OF ALL AGES IN POVERTY (1995)

County and State	Number	Percent
Elko	3,015	7%
Eureka	158	10%
Lander	533	8%
White Pine	1,040	11%
Nevada	167,315	11%

Source: U.S. Census Bureau 1995

NATIVE AMERICAN COMMUNITIES IN THE PROJECT AREA

Population and income statistics provided previously were derived from county-level information. These figures are typically driven by populated areas of the county, such as towns and cities, since rural populations in this part of the state are relatively low. As a result, statistics on minority and low-income populations, including African Americans and Hispanics in the project area, are also derived from the county's urbanized areas, such as the towns and cities of Elko, Wells, Eureka, Ely, Crescent Valley,

Austin, and Battle Mountain. Minority and low income populations of Native Americans, however, are primarily located on reservations in the project area. In the United States, rural poverty is disproportionately found on American Indian reservations (Summers 1995). There are eight Native American reservations in the project area[1], with a total estimated resident population of approximately 3,000 tribal members.

Table 3.18-4 provides a summary of Western Shoshone population estimates, employment, and poverty statistics by title and reservation location. Most of the reservation statistics were compiled by the Nevada Indian Environmental Coalition (NIEC) for the BIA. As shown in Table 3.18-4, of the nearly 3,000 reservation residents in the project area, approximately 1,400 tribal members were available for work, and 830, or 60%, of the work force was unemployed in 1997. On average, 45% of the employed reservation residents in the project area lived below the poverty level (BIA 1997). A brief description of the reservations and their distance from the project is provided below.

TABLE 3.18-4: NATIVE AMERICAN RESERVATION POPULATION, EMPLOYMENT, AND POVERTY IN THE PROJECT AREA (1997)

Western Shoshone Tribe/Reservation	Location	Total Residents	Labor Force	Employed	Percent Below Poverty Level (Employed)
South Fork Band	Lee	101	82	39	13%
Elko Band	Elko	616	352	250	36%
Wells Band	Wells	77	54	17	82%
Battle Mountain Band	Battle Mountain	178	100	46	52%
Ely Shoshone Tribe	Ely	350	139	49	33%
Duckwater Reservation	Duckwater	318	205	41	24%
Duck Valley Reservation (Nevada only)	Owyhee	1,233	732	357	39%
Yomba Reservation	Austin	112	52	28	86%
Total		**2,985**	**1,416**	**827**	**45% Average**

Source: Bureau of Indian Affairs, Labor Force Report (1997)

South Fork Band

The South Fork Band of the Te-Moak Tribe of Western Shoshone has 15,680 acres of tribal lands located in the town of Lee, approximately 30 miles south of the City of Elko in Elko County via State Route 228. Approximately 100 people live on this reservation, which was established in 1934 under the Indian Reorganization Act. The South Fork Band is located approximately 28 miles away from the closest proposed transmission line segment and approximately 33 miles from the Falcon substation.

Elko Band

The Elko Band of the Te-Moak Tribe of Western Shoshone has 192 acres of land within the City of Elko. Approximately 352 people live on this reservation, which was established in 1918 by Executive

[1] Native American reservations within the project area encompass a larger study area than for other minority or low income populations (the four-county region), as these tribal entities are the "Falcon to Gonder Project American Indian Tribal Organizations of the Region," and are interested parties in the public participation process of this EIS.

Order. The Elko Band is located approximately 32 miles away from the closest proposed transmission line segment and approximately 37 miles from the Falcon substation.

Wells Band

The Wells Band of the Te-Moak Tribe of Western Shoshone has 80 acres of land approximately one-quarter mile west of the City of Wells in Elko County. Approximately 77 people live on this reservation, which was established in 1977 by Public Law #95-133. The Wells Band is located approximately 85 miles northeast from the Falcon substation.

Battle Mountain Band

The Battle Mountain Band of the Te-Moak Tribe of the Western Shoshone has 683 acres of land about one mile west of Battle Mountain in Lander County. Approximately 178 people live on this reservation, which was established in 1918 by Executive Order. The Battle Mountain Band is located approximately 20 miles away from the closest proposed transmission line segment, and approximately 30 miles from the Falcon substation.

Ely Shoshone Tribe

The Ely Shoshone Tribe has nearly 100 acres of tribal land in three separate locations on the southwest and southeast sides of the City of Ely in White Pine County. There are approximately 350 people living on the tribal lands, which were established in 1931 by Authority of the Act of 27 June 1930, and increased in size in 1977. The Ely Shoshone tribal lands are located approximately 10 miles from the Gonder substation.

Duckwater Shoshone Tribe of the Duckwater Reservation

The Duckwater Reservation is located in Duckwater, Nye County, approximately 19 miles northwest of Currant, on State Route 379. The reservation is 3,814 acres in size and was established in 1940 by the Indian Reorganization Act. There are approximately 318 people living on the reservation, which is located approximately 30 miles away from the closest proposed transmission line segment.

Shoshone-Paiute Tribes of the Duck Valley Reservation

The Duck Valley Reservation is located in Owyhee on the Nevada-Idaho border, approximately 96 miles north of Eureka County via State Route 225. The reservation is 289,819 acres in size and was established in 1934 by the Indian Reorganization Act. There are approximately 1,233 people living on the reservation, which is located approximately 75 miles north from the Falcon substation.

Yomba Shoshone Tribe of the Yomba Reservation

The Yomba Reservation is located approximately 55 miles south of the town of Austin in Nye County via State Route 21. The reservation is 4,718 acres in size and was established in 1934 by the Indian Organization Act. Approximately 112 people live on the Yomba Reservation, which is approximately 80 miles west from the nearest proposed transmission line segment

3.18.3 ENVIRONMENTAL CONSEQUENCES

This section identifies the project's potential for disproportionate effects on minority and low-income populations. This section also provides a discussion of the proactive efforts taken by the applicant to ensure meaningful participation in the project from minority and low-income groups.

SIGNIFICANCE CRITERIA

The project would be considered to have a significant adverse impact to minority or low-income communities if:

- The transmission line would pass directly through or adjacent to a minority or low-income community, such that the community would be subject to a disproportionate share of adverse health effects, reductions in land values, or restricted access to needed services.

POTENTIAL EFFECTS ON MINORITY AND LOW INCOME COMMUNITIES IN THE PROJECT AREA

All corridor segments would be aligned through unpopulated or sparsely populated areas. None of the segments would pass through or near minority or low-income communities. The three segments closest to populated areas include the following:

- Segment B, approximately 2 miles west of the town of Crescent Valley.
- Segment I, approximately 28 miles north of the town of Eureka.
- Segment J, approximately 6 miles north the town of Ely.

Due to the distance between these segments and the towns of Crescent Valley, Eureka, and Ely, the project would have little or no discernable effect on minority or low-income populations who may reside in these towns. Due to the sparsely populated nature of the project area, the project would not affect substantial numbers of minority or low-income populations in the rural portions of the counties.

An average of approximately 45% of employable Native American reservation residents in the project area live below the poverty line. However, none of the route alternatives would pass through or near the eight identified Native American reservations in the area. The reservation closest to any segment is the Ely Reservation, located approximately 10 miles from the Gonder substation and Segment J and, thus, would not have any discernable effect on Native American populations in this area.

As a result, none of the route alternatives would disproportionately affect concentrations of minority and low-income populations, including those living nearby cities, and towns, or rural areas or on Native American reservations. Therefore, no mitigation measures would be required.

The project may have positive effects on minority and low-income populations in the project area. Benefits may include increased construction-related employment, increased spending, and expanded tax bases in the local economies (see Section 3.15, Social and Economic Values). Native Americans in the project area may benefit from further Western Shoshone studies, such as the development of oral history projects, associated with cultural resource mitigation measures (see Section 3.16, Cultural Resources).

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to all Route Alternatives

In general, the construction and operation of the project would have no substantial adverse effects to minority or low income communities within the project area. The project may, however, have a positive indirect effect on low income or minority communities. These effects are as described below.

Project Participation by Minority and Low Income Communities

The BLM has undertaken a number of efforts to ensure meaningful participation from minority and low income populations. Representatives from local tribes have participated in the cultural resource studies

initiated by the BLM, including participation by Western Shoshone tribal representatives in cultural resource surveys and inventories, as well as oral interviews and meetings with Western Shoshone tribal members and as survey crew members for traditional cultural property (TCP) and ethnohistoric/ethnographic studies.

The BLM also held a series of public meetings in the towns of Ely, Eureka, Carlin, and Crescent Valley to encourage public participation in the project's review, including public scoping meetings and other public process meetings, as required by NEPA. The BLM has specifically targeted Native American organizations in the region to participate in the public process.

SPPC has hiring and contracting policies in place to ensure meaningful participation from minority and low-income populations. Approximately 30 to 40% of the project workforce (45 to 60 people) would be local unskilled labor (see Section 3.15, Social and Economic Values, for further detail). The project work force would be directly hired by the prime contractor selected to complete the project. The prime contractor would then most likely hire other subcontractors to fulfill the labor requirements (personal communication with John Berdrow, SPPC, August 14, 2000). Depending on the availability of the local workforce and whether the selected prime contractor is a union contractor, these jobs may be advertised in the local Ely, Battle Mountain, or Elko newspapers as an opportunity to apply for project-related employment (personal communication with Randy Kashaba, SPPC, August 15, 2000). It is uncertain how many minority and low-income individuals would be hired specifically for the project, however, increases in project-related employment and other expenditures in the region may also bring indirect and temporary economic benefits to low-income and/or minority populations.

Proposed Measures to Avoid Impacts to Minority and Low-Income Communities

BLM has taken a number of measures to avoid impacts to minority and low income populations. These measures include intentional routing of transmission line segments away from populated areas that may contain low income and minority communities, as well as away from Native American reservations. Route alternatives and segments were selected to optimize the use of public land and minimize the use of private land.

The general public, including minority and low-income communities, is encouraged to become involved in project review and the selection of the preferred route alternative through the NEPA- public participation process and the local permitting process.

Access Road Impacts

The improved access roads leading to the project construction sites would be located within a sparsely developed region. The roads would not pass through or adjacent to a minority or low-income community. No Native American reservations would be affected by access road construction activities. For this reason, access road improvements would have no effect on minority or low-income communities.

Alternative-Specific Impacts

No direct or indirect impacts to minority or low-income communities were identified for any of the route alternatives.

RESIDUAL IMPACTS

No adverse effects to minority or low income communities were identified on a project-wide basis, or for any of the project segments. Therefore, no mitigation measures would be necessary. As a result, the project would have no residual impacts to minority or low income communities.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to low-income or minority populations could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy shortfall.

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3.19 NATIVE AMERICAN 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. Toward this end, the BLM has initiated coordination with Native American tribal representatives in the project area through data-gathering efforts. This process has provided tribal entities the opportunity to identify potential effects of the project on Native American interests.

This section describes the background study, which facilitates the coordination process between the BLM and Native Americans, identifies the Native American resource areas of interest, as well as the project's potential effects on Native American concerns. Also included are recommended mitigation measures to avoid or reduce potential effects to Native American concerns. This section primarily focuses on ethnobiotic concerns (i.e., culturally important plants and animals); Native American heritage concerns are addressed are Section 3.16, Cultural Resources.

3.19.1 AREA OF ANALYSIS AND METHODOLOGY

The analysis area for Native American concerns is defined as the 500-foot wide study corridor, 250 feet to each side of the proposed centerlines of the route alternatives. The methodology for the analysis of Native American concerns included a review of correspondence and/or communication records and ethnographic studies that address potential Native American issues and concerns within the analysis area. The process for identifying project-related Native American concerns involved a background study and interviews with concerned Native Americans. This process is described below. An ethnographic contact log summarizing the process is provided in SEI (2000b).

Background Study to Facilitate BLM Coordination with the Western Shoshone.

This study involved research of published ethnographies and history and unpublished archives, interviews with ethnographers and agency personnel with experience in the area, and a series of meetings and interviews with Western Shoshone tribal representatives, presentations to tribal councils, and focused interviews and field trips with individuals especially knowledgeable about the history of land use and traditions associated with the project area. Meetings and interviews were open-ended but guided by the research questions, and focused to identify Western Shoshone historic properties and potential traditional cultural properties. The study included three tasks: identifying primary contacts, identifying issues and potential properties and areas of concern, and disclosure (reporting the results).

First contacts between the ethnographer, Penny Rucks, and tribal representatives were made by phone on April 13, 1999, two weeks after the Battle Mountain Field Office had initiated formal coordination with a "project initiation letter." The letter, introducing both the ethnographer and the project, was sent to 21 people representing 14 separate tribal governments or inter-tribal organizations. Roberta McGonagle, the Tribal Relations Coordinator, has developed this list of contacts over several years. A series of phone conversations with tribal representatives initiated meetings to identify the primary contacts and to establish the protocol for conducting the research, coordinating with and informing all interested parties, and preparing the reports. While Western Shoshone history makes it clear that all 14 tribal governments and organizations would have a concern about the project area and that all property owners and tribal colonies or reservation areas were likely to include residents with ancestral ties to the study area, representatives worked with Rucks to initiate procedures to identify primary contacts and facilitate interviews and reviews of the reports.

Meetings ensued to establish these procedures. Kevin Brady, Sr. and Maurice Frank-Churchill, Chair and Vice Chair of the Yomba Shoshone Tribal Council suggested many of the procedures after coordinating with other tribal organizations. Other key contacts who participated in initial meetings included Lydia

Johnson, Chair, and Bernice Lalo of the Battle Mountain Band of the Te-Moak Tribe of Western Shoshone; Carrie Dann of the Western Shoshone Defense Project; and Lorrinda Sam, Kathy Griffin, and Cindy Marques of the Ely Shoshone Tribe. Information about the project and unfolding protocol for data collection was presented to the Ely Tribal Council June 18, 1999, and to the Yomba Tribal Council, July 8, 1999. SPPC, the archaeological consultant (SEI), and Western Shoshone representatives worked together to address the primary issue immediately raised by all Western Shoshone participants: how to effectively incorporate Western Shoshone expertise into data collection and how to protect cultural knowledge.

The Western Shoshone agreed to limit the scope of inquiry to primary contacts as long as all the contacts initially identified by the BLM had opportunities to review and comment on reports. In turn, SPPC authorized SEI to include two Western Shoshone cultural specialists as crew members for the archaeological survey already in progress. In addition, Carrie Dann and other staff of the Western Shoshone Defense Project were designated to work with Rucks to contribute to the inventory report, subject to review by other tribal organizations and individuals. The collaborative report would be based on the observations of the cultural specialists and identify sites potentially eligible as Western Shoshone historic properties and as TCPs, as a basis for identifying potential effects from the project and to propose mitigation.

At the same time, any of the tribal groups or representatives could identify individuals for focused interviews with Rucks about the analysis area. Field trips and interviews were conducted with individuals particularly knowledgeable about the project area. Additional contacts are available for interviews and additional field trips may be appropriate once the preferred alternative is identified.

REGULATORY FRAMEWORK

NHPA Amendment for Protection of Native American Values

As discussed in Section 3.16, Section 106 of the NHPA 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 consideration from archaeological sites and historic buildings (NPS 1986) 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 the following: 1) identifying potentially eligible properties and the values that make them eligible; and 2) assessing project effects on such properties, including identification of mitigation measures where possible.

National American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), 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. NAGPRA 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. Repatriation, on request, to the culturally affiliated tribe is required for human remains and associated funerary objects. Repatriation of other cultural items is dependent upon whether or not the original acquisition of an item was from an individual with the authority to alienate it from the tribal group (43 CFR Part 10).

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 in 1978. It requires the following actions from federal agencies: 1) accommodate access to and ceremonial use of sacred sites by Indian religious practitioners; and 2) 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.

American Indian Religious Freedom Act of 1978

The American Indian Religious Freedom Act of 1978 affirms United States policy that federal agencies will ensure 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.

Consideration of the proposed action in relation to these laws and regulations is provided below, as well as in Section 3.16, Cultural Resources.

3.19.2 AFFECTED ENVIRONMENT

ETHNOBIOTIC RESOURCE TOPICS OF INTEREST TO THE WESTERN SHOSHONE

Ethnobiotic resources are plants and animals that continue to play an important part in maintaining cultural traditions. The plant and animal resources described below are important in maintaining the cultural traditions of the Western Shoshone and have been summarized from the Class III Cultural Resources Inventory (SEI 2000a).

PLANT RESOURCES

Human settlement and travel are dictated by access to water and proximity to key resources, including plants and animals. Cultural plant species collected for food, medicines, and construction purposes are themselves key resources that condition human activity and components of plant communities that generate habitat for animals. In the central Great Basin, economic plants (plants used for construction and/or trading) are distributed in four vegetation zones; (1) saltbrush zone, (2) sagebrush zone, (3) pinyon-juniper zone, and (4) riparian zone (SEI 2000a).

It is important to acknowledge that climatic, cultural, and technological changes have significantly altered the distribution of some of these plants and even caused extinction. Climate fluctuations in particular have affected the ranges of entire vegetation zones. Yet, with the exception of pinyon, most of the plants that occur in these zones today are likely to have been present somewhere in the project area throughout most of the Holocene period (the last 10,000 years). The distribution and seasonality of economic plants important to the Western Shoshone may contribute insight into the relative intensity and timing of human activity within these vegetation zones.

As recounted to ethnographers and in tribal histories (Crum 1994; Fowler 1986; ITC 1976; Steward 1938; Thomas et al.), the distribution and harvesting seasons of economic species dictated the timing and direction of movements into traditional gathering areas. Seeds, for instance, had to be gathered after ripening but before natural dispersion. Only the tender emergent greens of wild onion (*Allium*

acuminatum), available first in valley floors and then higher elevations later in the year, were gathered (and still are), while bulbs of other onions and lilies were gathered in summer and fall.

Although the Western Shoshone groups had access to habitually visited resource areas with established camps, other less frequented areas provided alternatives for years when production was down or non-existent. Healthy social relations and ties to families in more distant locations provided additional contingencies. Resources that were especially abundant in a given year or place, such as a prolific pine nut harvest or rabbit population, provided opportunities for larger gatherings and reunions. Of particular importance in scheduling movements and length of residence was the imperative to harvest adequate stores for the winter, and the inclination to return to areas for plants that were intensively managed to sustain yields or promote desired growth characteristics.

Some of the Western Shoshone economic plants endemic to the project area are presented in Table 1-1 of the Class III Cultural Resources Inventory (SEI 2000a). With the exception of tobacco (*Nicotiana attenuata),* medicinal plants are not included due to the sensitive nature of the information. Additionally, although Western Shoshone pharmacopoeia was extensive and collection of medicinal plants for use and trade provided a powerful incentive for collecting trips, these were frequently individual endeavors and not reported as a primary factor in directing settlement; in fact, there is every indication that medicinal plants were frequently sought away from domestic settings. Tobacco is included because it was sown, indicating planned return, and grown as a trade item as well as for consumption (Steward 1938).

Many economic plants used for construction purposes were pruned and cut to encourage construction attributes over several seasons of growth. Many of these plants occur in the pinyon-juniper zone. Collectors would have returned frequently to tend and harvest these resources. Greasewood and sagebrush, two versatile resources for manufacture and construction of a variety of equipment and structures, are available from the saltbrush and sagebrush zones.

Of the 30 species of seeds and berry products collected for winter stores, eight occur in the saltbrush zone, 18 in the sagebrush zone, and 10 in the pinyon-juniper zone. Although sowing seeds from producers in the pinyon-juniper zone has not been documented, acquiring pine nuts from this zone was arguably the most prominent feature of providing winter stores. Other forms of tending and managing pinyon trees to increase cone production have been documented (Fowler 1996) and some researchers have suggested that pinyon colonization into the area may have been enhanced by human carriers who may have deliberately planted cones (Merhinger 1986; Rhode 1998; Rhode and Wigand 2000). A harvest ritual among pinyon collectors includes burying cones as a form of thanks giving. Together, these investments that entail returning to specific gathering localities suggest a significant degree of stability and predictability in an annual round that incorporated multiple contingent localities.

Winter settlements located along the sagebrush and pinyon-juniper vegetation zones would have provided access to the most plant resources, those most intensively managed, and provided a logistic base for camps and gathering loci in other zones. The fact that important winter stores occur and were sown in the saltbrush zone emphasizes the range and flexibility of the subsistence regime.

ANIMAL RESOURCES

Birds

Golden eagles (*Aquila chrysaetos*) and bald eagles (*Haliaeetus leucocephalus*) figure prominently in Western Shoshone mythology as messengers to and from the creator. Feathers were (and are) used by Indian doctors (shamans), usually as part of the healing ritual. Steward (1938) described traditional means of trapping and keeping eagles for their feathers that included climbing cliffs to capture and rear the young or various means of luring adult birds with bait; these birds were usually eventually released. Most

accounts emphasize the special power required to climb to aeries and that aeries were usually considered the property of these men.

Other birds, including sage grouse (*Centocerus urophasianus*), mourning dove (*Zenaida macroura*), and mockingbirds (*Mimus polyglottus*), were trapped in sagebrush country, and red-winged and yellow-headed blackbirds (*Agelaius phoeniceus* and *Xanthocephalus xanthocephalus)* near wetlands (Fowler 1986; Thomas 1986). Mormon crickets (*Anabrus simplex*), cicadas (*Okanagodes* spp.), and grasshoppers were collected when abundant.

Edible waterbirds include several duck species (*Anas cyanoptera, A. platyrhynochos,* A. *stepera, A. americana*), Canada goose (*Branta canadensis*), and great blue heron (*Ardea herodias*); coots (*Fulica americana*) were driven out of shallow water and clubbed in Ruby Valley (Steward 1938). Beaver and muskrat were also hunted.

Rabbits

Rabbits (*Lepus californicus*) were commonly taken in large numbers by communal drives, often associated with the fall pine nut harvest. Men, women, and children participated in driving rabbits into long nets. Rabbits seem to have been plentiful throughout the project area and were important for their meat and fur.

Other small mammals, including a variety of squirrels and mice, were trapped, skewered, and flooded from burrows (Fowler 1986). The yellow marmot (*Marmota flaviventris*), a mountain species, was particularly sought in the spring and was eaten, the fat rendered as a salve, and the fur tanned for robes (Steward 1938). Desert burrowers include pocket gophers, ground squirrels, and prairie dogs.

Big Horn Sheep

Big Horn Sheep (*Ovis canadensis*) are rare in the project area but were arguably once the most important large game of Western Shoshone prehistoric populations (Thomas 1986). It is clear that populations were once much greater and more widespread before progressive habitat destruction from Euroamerican mining and ranching. Once in the grassy foothills and bluffs, populations had retreated almost exclusively to less accessible high mountains in Steward's time. Big horn sheep were hunted in summer and winter by varied methods, including ambush from permanent blinds and chasing with dogs in the summer; migration hunting in the fall from rock walls, cairns, and blinds, particularly along canyons in precipitous terrain; and by encounter in the winter range when rams could be attracted by mimicking the sound of fighting by thumping logs together. Big horn sheep were hunted communally, and terrain and other factors localized these hunts. Communal hunts persisted in Ruby Valley through contact, attracting people from settlements in northern Butte and Long Valleys.

Antelope

Antelope (*Antilocarpa americana*) were probably the second-ranked large game and were communally hunted by large numbers of participants drawn to locales where antelope shamans resided, or where they called a hunt (Thomas 1986). This multi-day event required construction of a corral and wings for the drive and had magical associations. Drives were held every 5-12 years; the long interval between hunts was intended to allow populations to recover. The Humboldt River area, the north ends of Newark, Long, and Butte Valley, and the southern end of Diamond Valley were noted by Steward as good antelope areas and where antelope shamans were available (Steward 1938).

Deer

Deer *(Odocoileus hemionus)* habitat has expanded since contact, benefiting from reduced numbers of big horn sheep in the mountains and antelope in the bottom lands, and with game management focused on the popularity of deer as game. Deer hunting among the Western Shoshone, occasional and opportunistic in the past, became more important in proportion to reduction of other game. Deer herds

were small, and deer were most frequently hunted with bow and arrow by lone men or by small hunting parties who stalked and shot deer with arrows. Communal deer hunts were rare and sometimes involved antelope shamans (Thomas 1986).

Fish

Although fishing was apparently limited (Thomas 1986), the Humboldt fishery, located on the section of river spanned by the study corridor, is recognized as one of the most important fisheries in the Great Basin (Fowler 1986; Steward 1938). Steward also reported fishing in Pine Creek (1938:142) and that "Humboldt River fish were very important because they could be taken all winter" (1938:41). He provides a few details about technology and species. He states that in addition to techniques recorded for Owens Valley, such as diverting streams, stranding, confusing, shooting, spearing, using hooks, baskets and nets, the Humboldt River Shoshone also used harpoons and complicated dams and weirs, and three dam locations are reported near Elko by Steward at South Fork and Susie Creek (Steward 1938:159). The diversity of this complex suggests that fishing was well integrated into the economy. River fish would have been a more predictable staple than those from ephemeral playas, but low snowfalls periodically affected this fishery as well (Burche 1864 in Steward). Steward also noted that irrigation had almost dried up the river. Euroamerican emigration concentrated along the river corridor would have immediately impacted fishing structures and fish runs. It is certain that fishing was a primary focus for settlement and subsistence during climatic regimes when pluvial lakes characterized basin environments in Crescent Valley, for instance, and when wetlands and marshes were more extensive in Whirlwind, Pine, and Steptoe Valleys.

Steward identified eight species of fish as abundant in the Humboldt and its tributaries: *Castostomus tahoensis*, red sucker, up to 24 inches long; *C. arenarius*, sand-bar sucker, up to 20 inches long; *Pantosteus lahontan*, Lahontan sucker, up to 6 inches long and migrating upriver in July; *Siphateles obesus* lake chub, up to 14 inches long and very abundant; *Richardsonius egregius*, red-striped shiner, up to 5½ inches long; *Agosia robusta*, black minnow; *Cottus beldingi*, desert rifflefish; and *Salmo henshawi*, or tahoe trout (Shoshone *agai*). The latter was the most sought after, but the suckers and chub were also very important. In addition, Fowler (1986) lists the bull trout (*Salvelinus confluentus*) as taken.

3.19.3 ENVIRONMENTAL CONSEQUENCES

This section identifies the project's potential effects on Native American concerns and provides mitigation measures to eliminate or reduce their effects.

SIGNIFICANCE CRITERIA

The project would have a significant adverse impact to Native American concerns if it would:

- Pass directly through or adjacent to an identified resource area of concern for Native Americans, such that the resource area would be adversely impacted by the construction, operation, or maintenance of the transmission line.

ENVIRONMENTAL IMPACTS – COMPARISON OF ALTERNATIVES

Impacts Common to all Route Alternatives

This section identifies the Native American concerns that are common to all the route alternatives, and provides mitigation measures to avoid or reduce these potential effects. This section identifies ethnobiotic resources, as well as other Native American concerns, which may be affected by the project.

Ethnobiotic Resources

Native American tribal representatives contacted to facilitate the coordination process indicated that all of the ethnobiotic resources described above are important in maintaining cultural identity for the Western Shoshone. These individuals indicated that five of these resources would be potentially affected by the project (personal communication with Penny Rucks, September 22, 2000). These resources are identified in Table 3.19-1 and described below. Figure 3.19-1 identifies these areas on a map of the project area to the extent possible.

TABLE 3.19-1: NATIVE AMERICAN ETHNOBIOTIC RESOURCES OF CONCERN IN THE PROJECT AREA

Resource	Nearest Route Segment
Pinyon Pine	B, E, F, G, H, I, J
Sage Grouse	B, C, E, G, and J
Eagles	B, E (golden eagle nests)
Rabbits	N/A
Medicinal Plants	N/A

Source: Personal Communication with Penny Rucks, September 22, 2000
N/A = Not Appropriate for mapping due to the confidential nature of their locations, or non-existence the project area.

Pinyon Pine

The harvesting of pinyon pine nuts is considered an important part in maintaining the cultural identity of the Western Shoshone. Pinyon pine growth areas primarily occur above the 6,000-foot elevation in the project area, in the vicinity of all segments except for Segments A, C, and D[1] (see Figure 3.19-1.). Native American tribal representatives are particularly concerned about the potential disturbance of pinyon pines resulting from the construction, operation, and maintenance of the project. As described in Section 3.4, temporary losses to pinyon pine, as well as other vegetation types, could be caused by the placement of tower structures, wire setup areas, material yards, improved existing access roads, new spur roads, and the 30-foot-wide centerline travel route.

Implementation of mitigation measures described in Section 3.4 (Vegetation), would reduce potential impacts to pinyon pine to a less-than-significant level. These mitigation measures include: (1) restricting travel routes to the shortest feasible path during construction, (2) restricting all vehicle travel for construction and maintenance when the soil is too wet, and (3) minimizing vegetation removal wherever possible. These mitigation measures would reduce or eliminate impacts to pinyon pine woodlands, and are incorporated here by reference.

Eagles

For many Great Basin Indians, bald eagles and golden eagles are considered messengers to and from the creator and continue to play a central role in Western Shoshone cosmology (personal communication with Penny Rucks, SEI, September 22, 2000). Their care and protection are of particular importance. Feathers and other body parts of both (obtainable today, only by permit through the U.S. Fish and Wildlife Service) are only handled by those spiritually prepared to do so for religious and spiritual purposes, and for traditional healing. They play a central role in the Sun Dance and in the practice of contemporary spiritual leaders. The health and vitality of the eagle population are critical to these practices and to the population at large, who consider the presence of living eagles a good indication of

[1] Pinyon pine was not surveyed individually, but was included together with juniper during the vegetation survey completed for this project. As a result, actual occurrence of pinyon pine may be less extensive. These areas are referred to as Pinyon/Juniper.

continued well-being. Native American tribal representatives are particularly concerned about the potential for electrocution of bald and golden eagles that may perch on project transmission lines.

As discussed in Section 3.7, no significant adverse impacts are expected to occur to bald eagles because neither bald eagles nor their potential roost sites were located in the study corridor during biological surveys completed for this project. Potential roost sites are presumed to be located in portions of Newark and Diamond Valleys between 5 to 15 miles south of the nearest project segment (Segment E). Three golden eagle nests (two active, one inactive) were found in the project area (one on Segments B and two on Segment E), as discussed in Section 3.7. Mitigation measures in this section recommend that project construction activities avoid golden eagle nests within a 0.5 mile radius during the nesting season. Implementation of these mitigation measures would reduce impacts to Native American concerns about golden eagles to a less-than-significant level. Due to the bald eagle's distance from the project area, these areas are not mapped in Figure 3.19-1. Golden eagle nests are mapped in Figure 3.19-1.

Studies have shown that electrocution of raptors (including eagles) with transmission lines has not represented a significant mortality factor (see Section 3.7 for further detail). In addition, the wingspan of these raptors would not likely be long enough to contact two transmission wires at the same time, which would be required for electrocution to occur. For these reasons, the project would have a less-than-significant effect on eagles as a Native American resource of concern.

Sage Grouse

Sage grouse nesting and strutting grounds exist throughout the project area and are considered an important part in maintaining the cultural identity of the Western Shoshone. These areas are primarily located near Segments B, C, E, G, and J as shown in Figure 3.19-1. Native American tribal representatives are particularly concerned that the project would provide additional perches and nesting areas for predators, which may reduce sage grouse populations.

SPPC has committed to placing perch-deterrent devices on the poles of the transmission line located near active sage grouse habitats (leks) to discourage predator perching. In addition, construction activities would not occur within a 2-mile radius of an identified sage grouse lek, and certain restrictions of the time of construction activities would also apply. For more information, refer to Mitigation Measures Special-Status Species-7a, 7b, 8a, and 8b, as described in Section 3.7, Special Status Species. These mitigation measures would reduce or eliminate impacts to sage grouse populations and are incorporated here by reference.

Rabbits

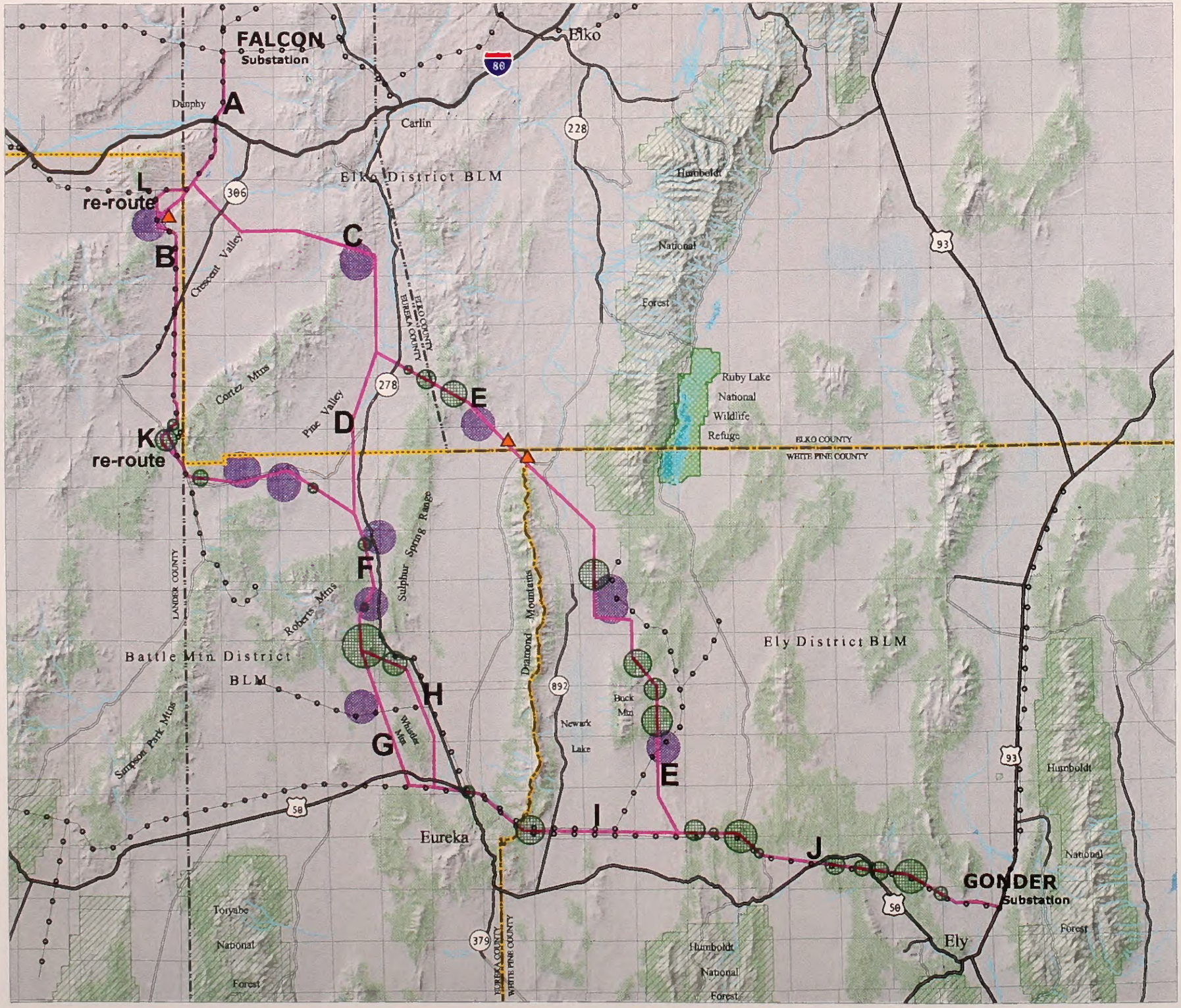
Rabbits are considered an important part in maintaining the cultural identity of the Western Shoshone. Traditional rabbit drives occurred throughout the project area, but particular concern was expressed about an area in the vicinity of Segment B, also an area recommended as a potential TCP (see Section 3.16 for further detail). For purposes of confidentiality, these areas are not mapped in Figure 3.19-1. Native American tribal representatives are particularly concerned that the project would provide additional perching and nesting areas for predators, which may reduce rabbit populations.

Use of perch-deterrent devices on transmission line poles in sensitive sage grouse habitat, as described in Mitigation Measure Special-Status Species–8a, Section 3.7, could also help reduce impacts associated with predation of rabbit populations in this location.

Sierra Pacific Power Co.

FALCON to GONDER Project

Native American Resources Areas of Concern



Areas of Pinyon/Juniper Concentration along Segments

Sage Grouse Leks (2 mile radius)

Golden Eagle Nest

Regional Pinyon/Juniper Resource Areas

BLM District Boundary

Route Alternatives

Existing Transmission Line

Scale 1 : 760,320

Kilometers 5 0 5 10 15 20 25 30

Miles 5 0 5 10 15 20

1" = 12 miles

N

GIS Mapping by EDAW, Inc. – San Francisco 4/24/01

Sources: Summit Envirosolutions 1999, 2000 / Utah State Univ – Remote Sensing (Nevada Gap Analysis) / EDAW 2000

Figure 3.19 - 1

Medicinal Plants

Plants containing medicinal properties are dispersed within the project area and are important in maintaining the cultural identity of the Western Shoshone. The types and locations of these medicinal plants are confidential in nature and are only known to Western Shoshone traditionalists (personal communication with Penny Rucks, September 22, 2000). Some medicinal plants are locally abundant, while others may be rare in occurrence. It is possible that the construction, operation, and maintenance of the project may disturb or destroy culturally important medicinal plants.

❑ ***Impact Native Concerns-1: Effects to Medicinal Plants***

Construction, operation, and maintenance of the project may disturb or destroy medicinal plants that are important in maintaining the Western Shoshone cultural traditions. This is considered a potentially significant adverse impact on Native American concerns.

❑ ***Mitigation Measure Native Concerns-1***

The BLM would interview Western Shoshone traditionalists knowledgeable about the location of traditional medicinal plants in the project area and discuss the need for avoidance during construction. Rare medicinal plant areas which may be located within or near project components (e.g., tower bases, centerline routes, improved access roads, etc.) would be field-checked by a botanist qualified to recognize such plants, and such information would remain confidential. Locally abundant or widespread medicinal plants would not require field-checking. If no medicinal plants, rare or otherwise, are identified in the project area no further mitigation measures would be required. If rare medicinal plants are identified in the project area and may be adversely affected by project construction, operation, or maintenance, the project would be designed to avoid them if possible. This may include relocating tower bases or rerouting the centerline travel route or other access roads. Other measures, such as protective fencing during construction, may also be required. These protective measures would be described in the COM Plan. If avoidance of the plants is determined infeasible, SPPC, the BLM, and tribal traditionalists would determine alternative mitigation measures.

Effects on Other Native American Concerns

A number of additional concerns were raised by Western Shoshone tribal representatives, cultural specialists, and survey participants during the coordination initiation process. These concerns relate to the environmental consequences of direct and indirect impacts to cultural resources, including archaeological sites, potential TCPs, and potential ethnohistoric districts. These potential impacts, and the mitigation measures recommended to avoid or reduce them, are provided in Section 3.16, Cultural Resources and are incorporated here by reference.

Other concerns are related to the cumulative effects of continued development of public lands within the Western Shoshone aboriginal territory, including the proliferation of utility corridors. This discussion lead to suggestions that the project adhere more consistently to existing utility corridors and highways, and questions were raised regarding diversions into undeveloped landscapes. The potential cumulative effects of additional utility corridors, and the mitigation measures recommended to avoid or reduce them, are provided in Chapter 5, Cumulative Impact Analysis, and are incorporated here by reference. An analysis of the proposed RMP amendments and their effect on Native American concerns is provided in Chapter 6. Both of these sections are incorporated here by reference.

There is also concern that the transmission line is connected to development for a nuclear waste railroad line through Western Shoshone traditional territory. These concerns have been noted and are included in the Ethnographic Study (SEI 2000b) which is pending review by the Ely Tribal Council.

The single most significant Native American concern, however, relates to the direct impacts to cultural resources posed by archaeological data recovery, which is the traditional means of mitigating impacts to

properties valued for their scientific values and eligible under Criterion D. According to Native Americans, excavation destroys land-based heritage and is perceived as disrespectful, leading to permanent removal of cultural items and continued appropriation of Western Shoshone culture and distortion of Western Shoshone prehistory.

Access Road Impacts

As described in Section 3.16, potential direct and indirect effects to cultural resources may occur as a result of improvements to existing access roads, construction of the centerline travel path, and new temporary spur roads. Native Americans are particularly concerned with continued loss to their cultural values and land-based heritage resulting from disturbance to cultural resources, including data recovery activities. Improved access roads have the potential to affect numerous cultural resources. Mitigation Measure Cultural-12 described in Section 3.16 would reduce the potential effects of access roads on Native American concerns. The proposed reclamation efforts would additionally reduce impacts to Native American concerns.

Alternative-Specific Impacts

No substantial adverse effects to Native American concerns have been identified by route alternative, or on a segment-by-segment basis. The resources identified in Table 3.19-1 are attributable to various project segments, but may occur throughout the entire project area. The locations of other resources are confidential in nature and do not lend themselves to a segment-by-segment analysis. As a result, the project effects on Native American concerns are considered common to all route alternatives.

Summary Comparison of Route Alternatives

TABLE 3.19-2: SUMMARY OF IMPACTS BY ROUTE ALTERNATIVE

Impact	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Impact Native Concerns-1: Effects to Medicinal Plants	X	X	X	X	X

RESIDUAL IMPACTS

After implementation of Mitigation Measure Native Concern-1, the primary medicinal plant areas would continue to be available to Native Americans in the project area. However, the protection of these plants is limited by the tribal traditionalists' memory of their locations. Some of these plants may exist outside of known locations and could be inadvertently lost due to construction activities. Implementation of Mitigation Measure Native Concern-1 would protect the primary locations of these plants. As a result, the residual impacts to medicinal plants is considered minor.

NO ACTION ALTERNATIVE

Under the No Action Alternative, impacts to Native American resources of concern associated with this project would not occur. However, resource impacts could occur in other areas as SPPC and the Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

3.20 COMPARISON OF ALTERNATIVES

This section provides a summary of the environmental impacts associated with the five transmission line route alternatives, as well as the No Action Alternative. Information from all 19 resource topics is combined here to facilitate the comparison of alternatives and identify the preferred alternative. As explained below, many of the impacts would be common to all of the route alternatives and do not differ greatly among the routes in terms of their extent or level of significance.

Therefore, to identify the preferred alternative, it was necessary to focus in on those resources and impacts that would be most useful in distinguishing among the five route alternatives. For this project, they include high-priority wildlife species subject to special regulatory protections or habitat management goals (e.g., special-status species and mule deer habitat), high priority invasive nonnative plants (e.g., noxious weeds and cheatgrass), cultural resources that receive special legal protection, and visual impacts that are not easily or entirely mitigable. These resource impacts were quantified using GIS technology and other mapping techniques, then the impacts for each route were tabulated and combined to give an overall ranking of route alternatives.

This ranking identified the Pine Valley (a) route as the environmentally preferred route alternative. The methodology used to compare route alternatives is described further in Section 3.20.1.2 and Appendix C.

This is preceded by a discussion of impacts that would be common to all route alternatives and an explanation as to why these resource topics were not considered primary characteristics in terms of their usefulness in distinguishing among the routes.

3.20.1 SUMMARY OF IMPACTS

IMPACTS COMMON TO ALL ROUTE ALTERNATIVES

Geology and Minerals

All of the route alternative would traverse areas with steep terrain (slopes >15%), seismic hazards, landslide potential, and soft, expansive, and corrosive soils, which could damage the tower footings. Engineering techniques that address these constraints include: soil testing, site investigations to avoid tower placement in active fault zones, selective use of helicopters in steep terrain, and reinforcing tower foundations. The Crescent Valley route alternatives could conflict with a planned Cortez mine expansion along Segment B (Pediment Mine). Mitigation could include coordinating with the mining company to acquire land and/or placing towers to avoid direct conflicts. Similarly, all routes traverse areas with oil, gas and geothermal resources in the vicinity; however, direct conflicts are not expected as these resources can usually be tapped in multiple locations and/or angle drilled to extract resources. Thus, geology and mineral impacts would be similar for all route alternatives and are not that useful in distinguishing between the routes.

Soils

All five route alternatives would traverse areas with highly erodible soils and steep slopes that could cause significant erosion impacts and special challenges related to reclamation success. These impacts and obstacles can be mitigated by minimizing grading and vegetation removal in problem areas, using erosion control best management practices, and using weight-dispersing construction equipment and techniques in wet areas or in highly erodible soils when feasible. Thus, soils are not considered a key characteristic for selecting the preferred alternative.

Water Resources

All five route alternatives have the potential to cause construction-related discharges of sediment and contaminants into water and alter flows in channels, shallow springs, and wells. Similarly, all five alternatives would cross blue line streams, floodplains, and flash flood hazard areas. However, impacts to water resources can be mitigated and, are therefore considered secondary characteristics for determining the preferred alternative.

Vegetation Resources

Losses of upland and disturbed plant communities would be adverse but not significant for any of the five route alternatives. Similarly, temporary disturbance to wetlands, other waters of the U.S. (e.g., Humboldt River), and riparian communities would be adverse but not significant. Mitigation measures that would minimize impacts include restricting construction vehicles and equipment to designated areas, using best management practices, installing fencing around wetland and riparian areas to create a buffer zones, and restoring wetlands and riparian areas to ensure no net loss. Thus, vegetation is considered a secondary characteristic for determining the preferred alternative.

Range Resources (Livestock and Wild Horses)

No significant adverse impacts to range resources were identified, as detailed in Section 3.8.

Public Health and Safety

The analyses of public health and safety impacts are focused on electric and magnetic fields (EMF), fire hazards, and hazardous materials. Research into EMF studies found a general consensus among medical and scientific communities that there is insufficient evidence to conclude that EMF causes adverse health effects. The potential of fire from transmission line construction and operation would be minimized through tree clearing in the right-of-way, engineering design, constructing the line based on minimum ground clearance, and other standards set by the National Electrical Safety Code, and implementing a Fire Prevention and Suppression Plan. SPPC would also implement a Hazardous Materials Management Plan, including spill prevention and control measures and blasting safety measures, to minimize hazards. These safety measures would be implemented for any of the route alternatives. Thus, this category is not considered useful for selecting the preferred alternative.

Noise

Short-term construction noise would be significant for residents and facilities within 2,000 feet of construction activities. However, this impact could be mitigated by requiring mufflers on vehicles and limiting noisy construction activities (such as blasting) near residences and other buildings between Monday through Saturday, 7 a.m. to 7 p.m. During project operation, people living or working near the right-of-way edge could experience noise from the transmission lines (i.e., humming or crackling noises during wet or humid conditions).

Transmission line noise could significantly impact approximately 10 existing residential units along Segment B near Crescent Valley (if one of those routes was used) and/or approximately 11 residential units in a subdivision along Segment J (which is common to all five route alternatives). However, these impacts could be mitigated to less-than-significant levels. Because of the extremely small number of existing residences involved and the opportunities for mitigation, noise is considered a secondary category for selecting the preferred alternative.

Air Quality

No significant adverse impacts to air quality were identified in Section 3.12. Therefore, this is not a highly useful category for selecting the preferred alternative.

Land Use and Access

The Crescent Valley (a) and (b) alternatives contain the most existing developments within 1,000 feet of the project (i.e., 27 and 30 residential units, respectively). The number of existing developments along the Pine Valley (a) and (b) alternatives rank in the middle (i.e., 16 and 19 units, respectively). The Buck Mountain alternative has the same number as the Pine Valley alternative (a) (i.e., 16 units), but less than Pine Valley (b). As a result, the Buck Mountain alternative would likely have the least potential conflict with existing development.

For privately held parcels in the proposed Falcon to Gonder right-of-way, the Buck Mountain alternative would traverse the greatest number (80), while the Pine Valley (a) alternative would traverse the fewest (56) (Stantec 2000). Since land use impacts related to right-of-way acquisition and loss of property values would be mitigated through payment of financial compensation to private property owners along any of the route alternatives, as described in Section 3.13, this is considered a secondary category for selecting the preferred alternative.

Recreation/Wilderness

No significant impacts to recreation or wilderness resources were identified in Section 3.14.

Social and Economic Values

No significant adverse impacts to social or economic values were identified in Section 3.15, other than those described above under Land Use and Access. Property tax benefits to local counties would occur with any of the route alternatives. Therefore, this is not considered a useful category for selecting the preferred alternative.

Paleontology

All of the route alternatives would cross the Hay Ranch Formation, which has a high potential for the existence of significant paleontological resources such as fossil mammals, plants, and invertebrates. Mitigation measures are recommended that would apply to all of the route alternatives. Thus, this is not a highly useful category for selecting the preferred alternative.

Environmental Justice

No environmental justice impacts were identified in Section 3.18.

Native American Concerns

All of the route alternatives have the potential to disturb or destroy medicinal plants that are important in maintaining the Western Shoshone cultural traditions. This was identified as a potentially significant adverse impact in Section 3.19. However, interviews with Western Shoshone traditionalists and pre-construction surveys would be conducted to identify areas with rare medicinal plants, and measures would be taken to avoid them or to identify other appropriate mitigation.

Access Roads

Analyses of access road impacts are provided throughout the resource sections in Chapter 3. Because there would not be substantial differences in the types of impacts or miles of access roads that would be required for the five route alternatives, this is not considered a useful category for selecting the preferred route. However, it is reflected in the analysis of invasive weed impacts, as explained in the following section.

DISTINGUISHING RESOURCE CATEGORIES AND IMPACTS

Based on the analyses contained in Chapter 3, the following resources and impacts were identified as being the most critical and useful for distinguishing between the alternatives and identifying a preferred route:

Resource Category	Impacts / Evaluation Factor
Wildlife and Special-Status Species	Mule deer winter range Sage grouse leks Ferruginous hawks Burrowing owls Golden eagles Pygmy rabbits
Invasive Nonnative Species (e.g., Noxious Weeds and Cheatgrass)	Existing noxious weed infestation Burned areas Undisturbed areas New non-parallel alignment New centerline and spur road construction Miles of access road improvements required
Cultural Resources	Areas of concern to Western Shoshone Prehistoric sites Historic sites Visual impact on cultural sites Eureka-Palisade Railroad grade Pony Express Trail Historic ranches
Visual Resources	Visual impacts on Key Observation Points (KOPs) New non-parallel alignment

This section summarizes the findings that led to identification of the Pine Valley (a) route as the preferred alternative. The methodology used to develop the impact summary tables and ranking of alternatives is explained below and in further detail in Appendix C.

Methodology

To facilitate the comparison of alternative routes, the distinguishing resources and impacts listed above were plotted on maps and quantified using GIS technology and other techniques. This data was recorded in a spreadsheet matrix and tabulated for each route segment as shown in Figure C-1 (Appendix C). The segment totals were then transferred to the following tables (Tables 3.20-1 through 3.20-4) and tabulated to show how the routes compare in terms of impacts to the four key resource categories.

To calculate the totals and ranking of each route alternative, Table 3.20-1 for example, shows the number of miles of sensitive wildlife habitat that the transmission line would cross by segment. The segment totals are then combined to obtain the route totals (e.g., the Crescent Valley (a) route is comprised of segments A+B+F+G+I+J), which are then multiplied by the impact rating score and the relative importance to get the total scoring numbers in the right hand columns.

High-Medium-Low impact ratings were assigned to each evaluation factor to reflect the fact that some impacts would be more significant than others, due to proximity or sensitivity of the resource. The impact ratings were given the following numeric values H (High) = 3, M (Medium) = 2, and L (Low) = 1. Appendix C provides more information about the assumptions behind these ratings.

Similarly, the relative importance rating gives greater importance to those resources that are most sensitive and afforded higher levels of regulatory protection than the others. For example, in Table 3.20-1, impacts to active sage grouse leks and ferruginous hawk nests are given higher relative importance ratings than impacts to other wildlife.

Finally, to identify the ranking of the route alternatives, the scores for each impact/evaluation factor are totaled up and the ranking is revealed. For example, the Pine Valley (a) route receives the best ranking in the Wildlife and Special-Status Species category. This methodology is repeated for the other three distinguishing resource categories (i.e., invasive species, cultural resources, and visual resources) and the individual rankings are combined to give an overall ranking of route alternatives (shown in Table 3.20-5).

This methodology is explained in further detail in Appendix C. The following presents the summary of impacts and route alternative rankings for each of the four key resource categories.

Wildlife and Special-Status Species Impacts

As shown in Table 3.20-1, the Crescent Valley (a) and (b) route alternatives would have the greatest overall impacts to sensitive wildlife species. In addition to crossing 10 to 12 miles of mule deer winter range, respectively, the Crescent Valley routes cross the most miles of ferruginous hawk territory and near several sensitive sage grouse leks. The Pine Valley (a) alternative ranks best in this category, having the fewest impacts to sensitive wildlife species overall. The Pine Valley (b) alternative ranks third, while the Buck Mountain alternative ranks second. Although Buck Mountain is the shortest route, it would be extremely close to several sensitive sage grouse leks and impact the greatest number of ferruginous hawk nests.

TABLE 3.20-1: COMPARISON OF ROUTE ALTERNATIVES WILDLIFE AND SPECIAL-STATUS SPECIES IMPACTS

Segments	A	B*	C	D	E	F	G	H	I	J	Impact Rating	Impact Rating Score	Relative Importance	Crescent Valley		Pine Valley		Buck Mtn
Wildlife and Special-Status Species	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles				(a)	(b)	(a)	(b)	
Mule Deer Winter Range		2.0	2.6			6.3	1.7	3.8			L	1	1	10.0	12.1	10.6	12.7	2.6
Sage Grouse Leks**			3.3			0.9					L	1	3	69.3	69.3	12.6	12.6	9.9
Sensitive Sage Grouse Leks		11.1			11.1	3.8					M	2	4	80.8	80.8	30.4	30.4	88.8
Historic Sage Grouse Leks		12.6	4.6		9.0	4.7		6.6	16.3	12.1	L	1	2	91.4	104.6	75.4	88.6	51.4
Ferruginous Hawk Nests		0.9			5.2	0.9	0.8	2.4	0.5		L	1	3	9.3	14.1	6.6	11.4	15.6
Ferruginous Hawk Nesting Territory		19.2	4.3		16.6	4.1	17.8	13.8	9.9	2.3	L	1	2	106.6	98.6	76.8	68.8	46.4
Burrowing Owl Burrows		0.6	1.7								L	1	2	1.2	1.2	3.4	3.4	3.4
Golden Eagle Nests					0.7						L	1	2	0.0	0.0	0.0	0.0	1.4
Pygmy Rabbit Burrows					0.9						L	1	2	0.0	0.0	0.0	0.0	1.8
													TOTAL	368.6	380.7	215.8	227.9	221.3
													RANK	4	5	1	3	2

* Segment B incorporating the L re-route.

** Sighted in 1999 and 2000 surveys

Note: The impact ratings reflect the level of impact anticipated after mitigation.

Invasive Nonnative Species Impacts

As shown in Table 3.20-2, impacts related to invasive nonnative species (e.g., noxious weeds and cheatgrass) would be highest on the Buck Mountain route alternative, as it has the greatest potential for introducing or spreading such weeds into relatively pristine habitat. The Buck Mountain route would involve the most miles of new non-parallel transmission line and the most miles of new disturbance to areas vulnerable to noxious weed invasions, including recent burn areas, which can be particularly vulnerable.

The Crescent Valley (a) and (b) route alternatives would have the lowest overall impacts related to invasive nonnative plant species. The Crescent Valley routes would involve the fewest miles of new ground disturbance and the most miles paralleling existing transmission lines. In general, this indicates that the Crescent Valley route alternatives would result in the fewest miles of new disturbance to areas vulnerable to weed invasions. The Pine Valley (a) route alternative ranks third best overall.

The table shows the relative importance of noxious weed infestations, 1999 burned areas, and new non-parallel alignment elevated above the other impacts. Existing noxious weed infestations are given a higher relative importance because there are so few miles of infestations to begin with. Burned areas and new non-parallel alignment are also elevated because they best characterize the differences between the routes in terms of vulnerability to new disturbances. The burned areas are particularly vulnerable to invasions if disturbed, while areas of new non-parallel alignment indicate areas without existing transmission line corridors nearby.

TABLE 3.20-2: COMPARISON OF ROUTE ALTERNATIVES INVASIVE NONNATIVE SPECIES IMPACTS (E.G., NOXIOUS WEEDS)

Segments	A	B*	C	D	E	F	G	H	I	J	Impact Rating	Impact Rating Score	Relative Importance	Crescent Valley		Pine Valley		Buck Mtn
	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles				(a)	(b)	(a)	(b)	
Noxious Weeds Infestation	0.1	0.1							0.2		L	1	100	40.0	40.0	29.0	29.0	9.0
Burned (1999)		7.2	9.5		12.1						L	1	25	178.8	178.8	238.3	238.3	540.8
Undisturbed	16.7	62.1	35.7	19.5	74.8	16.8	19.9	20.4	29.4	40.1	L	1	2	370.0	371.0	356.2	357.2	334.6
New Non-parallel Alignment		18.6	35.7	19.5	74.8	16.8	17.0	20.4			L	1	50	2620.0	2790.0	4450.0	4620.0	5525.0
New Centerline and Spur Road Construction	6.1	36.9	35.7	19.5	74.8	16.8	19.9	20.4	26.2	40.1	L	1	2	292.2	293.1	328.8	329.8	313.4
Access Roads Requiring Improvement	31.9	67.0	30.9		88.0	17.0	18.8	21.1	52.2	93.5	L	1	1	280.5	282.7	244.3	246.6	244.3
													TOTAL	3781.4	3955.6	5646.6	5820.8	6967.1
													RANK	1	2	3	4	5

* Segment B incorporating the L re-route.

Note: The impact ratings reflect the level of impact anticipated after mitigation.

Cultural Resource Impacts

The Crescent Valley (a) and (b) route alternatives could potentially affect the highest number of significant cultural sites (see Table 3.20-3). These two routes would come within 2 miles of several areas of concern to Western Shoshone tribes, as well as within 2 miles of six historic ranches. They also could impact a significant ethnohistoric property. These routes contain large numbers of significant or unevaluated historic and prehistoric sites within the 500-foot wide study corridor, indicating the potential for disturbance during construction of the transmission line.

TABLE 3.20-3: COMPARISON OF ROUTE ALTERNATIVES — CULTURAL RESOURCE IMPACTS

Segments	A	B*	C	D	E	F	G	H	I	J	Impact Rating	Impact Rating Score	Relative Importance	Crescent Valley		Pine Valley		Buck Mtn
Cultural Resources	#	#	#	#	#	#	#	#	#	#				(a)	(b)	(a)	(b)	
Areas of Concern to Western Shoshone (within approx. 2 miles)**																		
Low											L	1	3	3	3	0	0	0
Med											M	2	3	12	12	0	0	0
High											H	3	3	0	0	0	0	0
Significant (or unevaluated) Prehistoric Sites within 500 ft corridor																		
Low											L	1	3	0	0	0	0	0
Med	3	8	3	2		8	4	4	14	26	M	2	3	378	378	360	360	192
High		7	1	1	38	2	1	1	4	1	H	3	3	135	135	90	90	360
Significant (or unevaluated) Historic Sites within 500 ft corridor																		
Low		1							1	1	L	1	3	9	9	6	6	3
Med						6	1	1	3		M	2	3	60	60	60	60	0
High		3			3	1	1	1		1	H	3	3	54	54	27	27	36
Visibility from Eureka-Palisade Railroad																		
Low									1		L	1	2	2	2	2	2	0
Med			1		1			1			M	2	2	0	4	4	8	8
High				1		1					H	3	2	6	6	12	12	0
Historic Ranches within 2 miles		1			1		1		1		M	2	1	6	4	4	2	2
													TOTAL	665	667	565	567	601
													RANK	4	5	1	2	3

* Segment B incorporating the L re-route.

**Locations are confidential and hot shown.

Segments	A	B*	C	D	E	F	G	H	I	J	Impact Rating	Impact Rating Score	Relative Importance	Crescent Valley		Pine Valley		Buck Mtn
	#	#	#	#	#	#	#	#	#	#				(a)	(b)	(a)	(b)	
Visual Impacts to Cultural Sites																		
Low		1	1							1	L	1	1	2	2	2	2	2
Med		1			1		1		1		M	2	1	6	4	4	2	2
High		1		1	2			1			H	3	1	3	6	3	6	6
													TOTAL	11	12	9	10	10
													RANK	3	4	1	2	2

* Segment B incorporating the L re-route.

** Key Observation Point

Combined Rank Analysis

RANK	4	5	1	2	3

Note: Impact ratings in this category reflect the maximum possible impact to cultural sites before mitigation, because the exact locations of tower bases and other areas of disturbance have not yet been finalized and are therefore unknown.

The Buck Mountain route is ranked third among the alternatives in terms of impacts to cultural resources. It contains the most significant or unevaluated prehistoric sites within the 500-foot wide study corridor. The Pine Valley (a) and (b) alternatives are ranked first and second in this category, respectively.

The distribution of site types along the Crescent Valley and Pine Valley route alternatives are approximately 50% prehistoric, 34% historic, 15% multi-component, and 1% modern resources (or of unknown date). These sites were identified within the study area during field surveys and through literature searches. The Buck Mountain route alternative exhibits a slightly higher percentage of prehistoric sites (58%) over historic sites (24%).

Not every significant cultural resource site identified in the table would be directly affected by project construction. Many of these resources could be strategically avoided during construction. Impact ratings in this category reflect the maximum possible impact to cultural sites before mitigation, because the exact locations of tower bases and other areas of disturbance have not yet been finalized and are therefore unknown.

The Crescent Valley and Pine Valley route alternatives would be constructed near properties that could contribute to the proposed Roberts Mountain ethnohistoric district. The Pine Valley (a) and (b) routes have the fewest numbers of significant or unevaluated prehistoric sites. The Pine Valley (a) and (b) and Buck Mountain alternatives would involve impacts to the Colonel Conner Massacre Site, a potential ethnohistoric property. All of the route alternatives would cross the historic Pony Express Trail and cross or come within view of the historic Eureka-Palisade Railroad grade. Overall, the Pine Valley (a) route alternative receives the best score in the cultural resources category.

The Buck Mountain alternative would traverse the largest number of significant prehistoric sites. Many of these sites also retain a high amount of integrity given their relatively remote location. This route also would transect an aboriginal trail and could affect 12 recorded cultural properties that may contribute to a proposed ethnohistoric district. It would also transect cultural properties that could contribute to an ethnohistoric district associated with antelope hunting, would cross the Pony Express Trail, and would be within the viewshed of the Emigrant Trail. Visual impacts to cultural sites are also rated in this table.

Visual Resource Impacts

All five route alternatives would cause visual impacts related to ground disturbance during construction. These impacts can be mitigated by minimizing grading and vegetation removal and implementing the Reclamation Plan in Appendix E. Table 3.20-4 summarizes the visual impacts of the project on Key Observation Points (KOPs). The BLM and State Historic Preservation Office representatives identified these KOPs along the five route alternatives (see Figure 3.9-1 in Section 3.9, Visual Resources, for the KOP location map). Table 3.20-4 lists the number of KOPs with low, medium or high visual impact ratings, which is based on a comparison of the project's contrast against the BLM established visual resource management class objectives. These ratings reflect the anticipated level of impact before mitigation, because it is used to determine if the mitigation measure brings the proposed activity into compliance with the established management activity.

The bottom half of Table 3.20-4 compares visual impacts related to design type, specifically whether or not the transmission line would be located alone in the landscape or would parallel an existing line. New non-parallel alignment was assigned a high impact rating. Parallel alignment within approximately 1,000 feet of an existing transmission line 60 kV or greater was assigned a medium impact rating. Parallel alignment within approximately 250 feet of an existing transmission line 60 kV or greater was assigned a low impact rating (i.e., the most desirable from a visual impact perspective).

These two subcategories were then combined (giving the KOP rankings 75% weight and the design type rankings 25% weight) to reveal an aggregate ranking. This combined ranking reveals that the Pine Valley (a) alternative is the preferred route for minimizing impacts to visual resources. Analysis of the visual impacts associated with each alternative follows.

All of the route alternatives would cross a BLM designated "Low Visibility Corridor" along Interstate 80 and would be visible to eastbound and westbound traffic. This is considered a medium visual impact, as there is already an existing transmission line at this crossing.

TABLE 3.20-4: COMPARISON OF ROUTE ALTERNATIVES — VISUAL RESOURCE IMPACTS

Segments	A	B*	C	D	E	F	G	H	I	J	Impact Rating	Impact Rating Score	Relative Importance	Crescent Valley		Pine Valley		Buck Mtn
Visual Resources	#	#	#	#	#	#	#	#	#	#				(a)	(b)	(a)	(b)	
Visual Impacts to KOPs**																		
Low		4	1	1		1				2	L	1	1	7	7	5	5	3
Med	1	1	1	1	4		2	2		3	M	2	1	14	14	16	16	18
High		1			2			1	1		H	3	1	6	9	3	6	6
													TOTAL	27	30	24	27	27
													RANK	2	3	1	2	2

* Segment B incorporating the L re-route.

** Key Observation Point

Segments	A	B*	C	D	E	F	G	H	I	J	Impact Rating	Impact Rating Score	Relative Importance	Crescent Valley		Pine Valley		Buck Mtn
Transmission Line Alignment	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles				(a)	(b)	(a)	(b)	
New Non-parallel Alignment		18.6	35.7	19.5	74.8	16.8	17.0	20.4			H	3	1	157.2	167.4	267.0	277.2	331.5
Parallel Alignment +/- 1,000 ft from exiting transmission line (60 kV or >)		8.1					2.9		23.4	28.3	M	2	1	125.4	119.6	109.2	103.4	56.6
Parallel Alignment +/- 250 ft from existing transmission line (60 kV or >)	16.7	35.4							6.9	11.7	L	1	1	70.7	70.7	35.3	35.3	28.4
													TOTAL	353.3	357.7	411.5	415.9	416.5
													RANK	1	2	3	4	5

* Segment B incorporating the L re-route.

** sighted in 1999 and 2000 surveys

Visual Resources — KOP Impacts and Alignment — Combined Rank Analysis

75/25	7	11	6	10	11
RANK	2	4	1	3	4

Note: Impact ratings in this category reflect the level of impact before mitigation, because the exact locations of towers have not yet been determined.

The Crescent Valley (b) route alternative would have the highest number of significant impacts to KOPs. Both Crescent Valley (b) and Pine Valley (b) route alternatives would create a significant impact to KOP 21 at the Pony Express Trail crossing. Crescent Valley (a) and (b) route alternatives have the most miles of existing transmission lines (i.e., parallel alignment opportunities) – a positive element for minimizing visual impacts. KOP 10 represents a significant historic site (Eureka-Palisade Railroad grade) and the Pine Valley (a) and (b) and Buck Mountain routes would have a significant impact to the landscape context and visual setting of this historic feature.

The Buck Mountain route alternative ranks in the middle between the Crescent Valley and Pine Valley routes in terms of significant visual impacts to KOPs. The Visual Resource Management (VRM) analysis resulted in strong structural contrast ratings for all KOPs along Segment E of the Buck Mountain route and moderate visual impacts for four KOPs and significant impacts for two KOPs. It also would have a significant impact on a portion of the historic Eureka-Palisade Railroad grade represented by KOP 12, due to the importance of the surrounding landscape to the site. The Buck Mountain route alternative has the fewest miles of existing transmission lines (i.e., fewest parallel alignment opportunities), and thus ranks worst under the alignment category.

While significant visual impacts would be encountered with all the alternatives, the Pine Valley (a) alternative ranks the best overall in terms of visual impacts. It would have the fewest significant impacts to KOPs, including visual impacts to cultural sites (as shown in Table 3.20-3). Of the two significant

impacts, one is due to the contrast rating's inconsistency with the established management objectives along Segment D; the second is due to a cultural site's integrity and visual setting being impacted by the proposed transmission line along Segment I. These impacts and proposed mitigation measures to reduce visual contrast and visual impact are discussed in detail in Sections 3.9 and 3.16.

3.20.2 IDENTIFICATION OF THE ENVIRONMENTALLY PREFERRED ROUTE ALTERNATIVE

As shown in Table 3.20-5, the Pine Valley (a) route scores best in three out of the four key resource categories, making it overall the environmentally preferred route alternative.

TABLE 3.20-5: SUMMARY OF RANKINGS — ROUTE ALTERNATIVES COMPARISON

	Crescent Valley (a)	Crescent Valley (b)	Pine Valley (a)	Pine Valley (b)	Buck Mountain
Wildlife	4	5	1	3	2
Invasive, Nonnative Species	1	2	3	4	5
Cultural Resources	4	5	1	2	3
Visual Resources	2	4	1	3	4

The methodology for comparing and ranking the route alternatives is described in detail in Appendix C. The BLM has also selected the Pine Valley (a) route as the agency preferred alternative based on the analyses and findings in this document, including the analysis of the No Action Alternative presented below, as well as consideration of cumulative impacts, the proposed RMP amendments, the purpose and need for the action, and other findings in this EIS.

3.20.3 UNAVOIDABLE SIGNIFICANT ADVERSE EFFECTS

While the majority of environmental impacts would be fully mitigated by SPPC through avoidance of sensitive areas, reclamation, best management practices, and other techniques, impacts to the following resources could remain significant and unavoidable with the Pine Valley (a) transmission line route (i.e., the preferred alternative):

- Visual impacts to the setting of the historic Eureka-Palisade Railroad grade (as shown in KOP 10 at the intersection of Segments C and D). Please refer to Section 3.16, Cultural Resources, for more detail about visual impacts to the historic railroad setting.

Although residual impacts may remain significant after mitigation, the mitigation measures provided in Section 3.16 could be implemented to reduce the impact.

3.20.4 NO ACTION ALTERNATIVE

The National Environmental Policy Act (NEPA) requires that an EIS include analysis of the "No Action Alternative," against which the effects of the "action" alternatives can be evaluated and compared. The No Action alternative in this EIS would mean that no new transmission facilities would be constructed

between the Falcon and Gonder substations. Under the No Action Alternative, SPPC would attempt to meet its rapidly growing customer needs with existing facilities, along with other measures to compensate for the anticipated shortfall in the supply of electrical power in the region. The No Action Alternative also would mean that the associated BLM Resource Management Plan amendments would not be required.

Under the No Action Alternative, the projected shortage of electric power in SPPC's control area will continue to grow as customers demand greater amounts of electricity. This shortage is forecast to occur during peak load conditions in the summer of 2003, and may result in the curtailment of some customers. Under this alternative, there will also be a continued shortage of recommended energy reserves during peak load conditions. This existing shortage could result in SPPC's inability to provide service to some customers during unscheduled outages of major transmission or generation facilities. Under the No Action Alternative, adverse environmental, socioeconomic, and electric service impacts could result from compensating actions taken by SPPC to ensure an adequate, affordable, and reliable energy supply to northern Nevada.

If the No Action Alternative is selected following the EIS and right-of-way application review process, SPPC would immediately notify the State of Nevada Public Utilities Commission that it cannot comply with the commission's Electric Resource Planning Opinion and Order issued April 8, 1999. This order found that the Falcon to Gonder 345 kV transmission project is in the public interest. Following notification, SPPC and the commission would most likely initiate an emergency planning process to determine the best way to meet forecast customer energy requirements.

GEOLOGY AND MINERALS

Under the No Action Alternative, none of the project-related impacts to geology and mineral resources would occur. Geologic and topographic conditions would remain unchanged, except as they might be affected by other projects, notably mining. Geologic hazards would continue as noted in Section 3.1. However, similar impacts could occur in other areas as SPPC and the State of Nevada PUC would begin emergency planning efforts to pursue other transmission and/or generation projects to meet the projected energy load capacity shortfall.

SOILS

Under the No Action Alternative, impacts to existing soils would not occur from this project. Soils associated with this project would remain as they currently exist. Impacts to soils in portions of the project area could still result from other unrelated projects proposed within the area. Undetermined impacts to soils could also occur in other locations if an alternative project were proposed to replace this one.

WATER RESOURCES

Under the No Action Alternative, the potential impacts identified in Section 3.3 with regard to water resources would not occur. Construction activities would not occur, thereby avoiding effects of discharges of sediment and contaminants to water courses. Hazards related to flooding and flash floods would remain as natural events. No impacts to wells related to project construction activities would occur. In sum, no project-related impacts would occur. It is assumed that impacts related to other projects would be the subject of separate environmental impact evaluation and mitigation and permit requirements.

VEGETATION

The No Action Alternative would avoid project impacts to existing vegetation resources, as described in Section 3.4. However, undetermined impacts to vegetation resources could also occur in other locations if an alternative project were proposed to replace this one.

INVASIVE NONNATIVE SPECIES

Under the No Action Alternative, impacts related to invasive nonnative species would not occur from this project. Existing noxious weed and cheatgrass infestations would remain on trajectories of growth and spread as they currently exist. The No Action Alternative would continue current management practices under the approved Shoshone-Eureka RMP, the Egan Resource Area RMP, and the Elko Resource Area RMP, and proposed the Falcon to Gonder transmission line would not be constructed on public lands in these resource areas. Impacts related to invasive nonnative species could still result from other projects proposed within the project area (see Cumulative Impacts discussion in Chapter 4). Undetermined impacts related to invasive nonnative species could also occur in other locations if an alternative project were proposed to replace this one.

WILDLIFE AND WILDLIFE HABITAT

Under the No Action Alternative, impacts to existing wildlife habitat associated with this project would not occur. Potential impacts to nesting passerines and raptors would not occur. Any replacement project would likely have some impacts on wildlife and wildlife habitat.

SPECIAL-STATUS SPECIES

Under the No Action Alternative, impacts to existing special-status species and their habitat associated with this project would not occur. However, habitat improvements that could result from mitigation measures would not be implemented either.

RANGE RESOURCES

Under the No Action Alternative, the minor impacts to livestock grazing and wild horses associated with this project would not occur. However, a replacement project could have impacts on range resources, if located on similar public lands and/or open space.

VISUAL RESOURCES

The No Action Alternative would continue the current management of public lands under established and interim Visual Resource Management (VRM) Classes for the protection of visual values in the BLM's Shoshone-Eureka, Elko, and Egan planning areas. Impacts from the proposed transmission line that would potentially exceed established and interim VRM Class objectives would be avoided. However, any replacement project could also pose visual impacts to the surrounding landscape.

PUBLIC HEALTH AND SAFETY

Project-related public health and safety hazards related to fire, hazardous materials, electricity, and blasting would be avoided with the No Action Alternative. However, a transmission and/or generation replacement project would likely involve similar impacts in other areas.

NOISE

Under the No Action Alternative, there would be no significant noise impacts associated with construction or operation of the transmission line. However, a replacement project, such as another transmission line corridor or energy plant, would likely involve some noise impacts as well.

AIR QUALITY

Under the No Action Alternative, there would be no air quality impacts associated with construction or maintenance of the transmission line. Existing roads would not require improvements to construct this project. However, a replacement project, such as another transmission line corridor or energy source such as a coal-fired power plant, would likely involve some air quality impacts.

LAND USE AND ACCESS

Under the No Action Alternative, the potential impacts related to land use and access would be avoided. These impacts would include potential disturbances of private land, potential conflicts with existing land uses or existing rights-of-way, right-of-way acquisition, potential displacements of urban/industrial development, and potential conflicts with applicable land use plans or policies. Under the No Action Alternative, existing land uses (i.e., private development, agriculture, etc.) would continue in the project area. The No Action Alternative would continue current land use and realty action practices under the approved Shoshone-Eureka RMP, the Egan RMP, and the Elko RMP. Land use and access impacts would need to be evaluated for any replacement project.

RECREATION AND WILDERNESS

No substantial adverse impacts to recreation/wilderness from the project were identified. However, any replacement project that would be pursued if No Action Alternative is selected would be evaluated for potential impacts to recreational and wilderness areas.

SOCIAL AND ECONOMIC VALUES

Under the No Action Alternative, the impacts related to potential conflicts with mining operations and loss of property value would be avoided. However, mitigation measures are available that could avoid or reduce these impacts. Project benefits from increased employment, increased local sales taxes, and

increased local property taxes would be unrealized as a result of the No Action Alternative. Other communities in the vicinity of any replacement project would likely reap these benefits.

CULTURAL RESOURCES

Under the No Action Alternative, the impacts to cultural resources resulting from the project would be avoided. Some specific impacts that would be avoided under the No Action Alternative would be the visual intrusions upon potential TCPs and historic sites (e.g., Pony Express Trail and Eureka-Palisades Railroad grade). However, cultural resource impacts could be involved with any replacement project.

PALEONTOLOGY

Under the No Action Alternative, the impacts to paleontological resources resulting from the project would be avoided. However, paleontological resource impacts could be involved with any replacement project.

ENVIRONMENTAL JUSTICE

No substantial adverse impacts to minority and low-income communities resulting from the project were identified. If a replacement project were located on federal public land, it would need to be evaluated for potential environmental justice impacts.

NATIVE AMERICAN CONCERNS

Under the No Action Alternative, the potential impacts to medicinal plants of concern to local Native Americans would be avoided. However, any replacement project located on federal public land would be evaluated for similar resource impacts and other Native American concerns.

CHAPTER 4

CUMULATIVE IMPACTS, SHORT-TERM USE OF THE ENVIRONMENT VS. LONG-TERM PRODUCTIVITY, IRREVERSIBLE / IRRETRIEVABLE COMMITMENT OF RESOURCES

4.0 CUMULATIVE IMPACTS, SHORT-TERM USE OF THE ENVIRONMENT VS. LONG-TERM PRODUCTIVITY, IRREVERSIBLE / IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires evaluation of a proposed action's potential to contribute to "cumulative" environmental impacts. A cumulative impact is defined as:

> The impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts can result from similar projects or actions, as well as from projects or actions that have similar impacts (40 CFR 1508.7).

In this case, such similar projects would include other major linear projects that create ground disturbance and visual impacts (e.g., transmission lines over 60 kV; long-distance, buried or aerial fiber-optic cables; mining operations; major roads or railroads; and designated utility corridors allowing future utility projects).

The objective of the following analysis is to evaluate the significance of the proposed action's contribution to cumulative environmental impacts. The cumulative impact analysis is accomplished in three steps:

Step 1: Identify the cumulative impacts study area for each resource evaluated;

Step 2: Identify and describe past, present, and reasonably foreseeable future actions in the cumulative impact study area that are similar to the proposed action or have substantial impacts to which the proposed action would contribute; and

Step 3: Evaluate the potential for the proposed action to have a substantial contribution to cumulative environmental impacts with the potential to significantly affect the environment, based on the significance criteria identified in Chapter 3.

4.1 CUMULATIVE IMPACTS STUDY AREA AND TIMEFRAME

The cumulative impacts study area (CISA) considers two areas:

- A 3-mile-wide utility corridor contiguous with the preferred alternative (i.e., the Pine Valley (a) route alternative) and the immediately adjacent area; and

- As appropriate, the wider four-county project area , including all of Eureka County and the relevant portions of Lander, Elko, and White Pine counties. This area is similar to that presented in Figure ES-1, excluding areas east of Carlin and north of the White Pine/Elko County line.

The CISA necessarily varies in size and shape according to the characteristics of the resource topic being analyzed. The CISA for soils, vegetation resources, wildlife and wildlife habitat, fire, reclamation, and noxious weeds covers a 3-mile wide corridor along the route alternatives. The CISAs for the remaining resource topics considered in this EIS are identified below:

Geology and Minerals:	Designated mining districts within 10 miles of the preferred route alternative.
Water Resources:	All affected watersheds (surface water resources), aquifers (groundwater resources) in the immediate vicinity of the substations and maintenance yards, and downstream areas.
Air Quality:	The project area, as well as the air basins within which the proposed construction activities occur.
Special Status Species: (Animal and Plant)	Same as the project study corridor.
Range Resources (Livestock and Wild Horses):	All affected allotments and Herd Management Areas (HMAs) crossed by the project route alternatives.
Land Use and Access:	The predominantly public lands crossed by the project route alternatives.
Recreation/Wilderness:	All of Eureka and White Pine counties, the northern portion of Lander County including the towns of Battle Mountain and Austin, and the southwestern portions of Elko County.
Visual Resources:	3-mile wide corridor viewshed as seen from the 29 Key Observation Points along the project route alternatives.
Social & Economic Values:	All of Eureka, White Pine, Lander, and Elko counties.
Cultural Resources:	The viewshed for Traditional Cultural Properties (TCPs) and sites eligible for National Historic Preservation Act listing under Criteria a, b, and c; the 500-foot wide corridor, plus a 100-foot buffer to each side, for TCPs and sites eligible under Criterion d; and 100 feet to each side of the centerline for access roads.
Public Health and Safety: (Hazardous Materials, Fire and EMF)	1.5 miles on each side of the centerline, and all residential areas, including, but not limited to ranches, the town of Ely, the town of Eureka, and the town of Crescent Valley. The CISA for EMF, specifically, includes 500 feet to either side of the project transmission line. Where the project would parallel existing transmission lines, the area of cumulative impact would be increased by an additional 500 feet.
Environmental Justice:	Any identified minority or low-income populations likely to be affected by the construction, operation, and maintenance of the transmission line.
Native American Concerns:	The width of the proposed utility corridor (if designated in the BLM Resource Management Plan amendments), which will be up to 3 miles wide.
Noise:	Same as the project study area.

The timeframe for the cumulative impact analysis begins at the time of project construction in 2002 and extends to the year 2033 (i.e., the length of the BLM right-of-way grant). It includes existing conditions of the landscape, specifically, alterations from past developments and uses of the land.

4.2 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Information about the overall ground disturbance from past, present, and reasonably foreseeable future actions in the project area was gathered from the BLM and other agencies, field surveys, adopted plans, maps, environmental documents, and personal communications with utility companies. The relevant past, present, and reasonably foreseeable future projects listed below are those that were known or projected as of February 2001. Changes in projects after this time are not considered in this analysis. The estimated amounts of cumulative ground disturbance associated with those actions are described below and summarized in Table 4-1.

TABLE 4-1 ESTIMATED CUMULATIVE GROUND DISTURBANCE

	Total Length (miles)	Estimated Construction Disturbance Width (feet)	Total Disturbance Area (acres)	% of Total Disturbance
PAST ACTIONS				
Transmission Lines/Fiber Optic Lines				
345 kV TL (Valmy to Falcon) – SPPC	49.7	30	181	0.5%
230 kV TL (heads east to Gonder) - SPPC	116.8	30	425	1.3%
120 kV TL (surrounding Falcon) – SPPC	60.2	20	146	0.4%
120 kV TL (Falcon to Cortez) – SPPC	72.4	20	175	0.5%
69 kV TL (Falcon - Cortez) – MWP	14.9	15	27	0.1%
69 kV TL (Cortez Mine - Tonkin Spring) – SPPC	27.0	15	49	0.1%
69 kV TL (Machacek - Buck Mountain) – MWP	69.4	15	126	0.4%
69 kV TL (Gonder - north along I-93) – MWP	51.1	15	93	0.3%
60 kV TL (Falcon - north) - SPPC	22.4	15	41	0.1%
Fiber optic line east-west along I-80 ROW - WC	49.1	30	179	0.5%
Mining Operations				
Cortez Mining District	n/a	n/a	8,800	26.2%
Bald Mountain / Buck Mountain mining area	n/a	n/a	2,400	7.1%
Eureka Mining District	n/a	n/a	800	2.4%
Airports				
Eureka County Airport	n/a	n/a	800	2.4%
White Pine County Airport (Yelland Field – Ely)	n/a	n/a	3,450	10.3%
Roads/Railroads				
I-80	49.1	300	1,786	5.3%
Hwy 50	129.0	120	1,876	5.6%
Hwy 93	65.2	120	949	2.8%

TABLE 4-1 ESTIMATED CUMULATIVE GROUND DISTURBANCE (CONT.)

	Total Length (miles)	Estimated Construction Disturbance Width (feet)	Total Disturbance Area (acres)	% of Total Disturbance
Hwy 306	33.1	60	240	0.7%
Hwy 278	88.2	60	642	1.9%
Hwy 892	38.3	60	278	0.8%
Union Pacific Railroad -- I-80 corridor (2 lines)	107.6	40	522	1.6%
Nevada Northern Railroad in Ely area (1 line)	84.2	40	408	1.2%
PRESENT ACTIONS				
Fiber Optic Line - within Hwy 50 ROW – SPC (aka Silver State East Project)	129.0	30	469	1.4%
Fiber Optic Line (Newark Valley - Ely) - NB	75.2	30	273	0.8%
Fiber Optic Line (Ely - Cherry Creek) - NB	67.0	30	244	0.8%
Fiber Optic Line (Cold Creek - Fish Springs Valley) - NB	40.0	30	145	0.4%
Cortez South Pipeline Project	n/a	n/a	4,450	13.2%
Cortez Joint Venture Horse Canyon Exploration Project	n/a	n/a	50	0.1%
FUTURE ACTIONS				
SWIP Corridor (Parallel to US 93) - IPC	65.3	40	317	0.9%
Utility Corridor (2-3 additional TLs along Preferred Alt. Route,) – SPPC, other companies *	179.1	75	1,628	4.8%
Yucca Mtn Branch Rail Line Project (Beowawe to Yucca Mtn.) – DOE (portion within CISA only)	82.2	50	498	1.5%
White Pine County Airport ILS (runway extension project) – White Pine County / FAA	n/a	n/a	700	1.4%
Cortez Joint Venture Pediment Mine Project	n/a	n/a	454	1.4%
TOTAL DISTURBANCE (acres)			33,620	100.0%
Preferred Alternative - Pine Valley (a) transmission line route (temporary construction disturbance area)		n/a	**2,172**	**6.4%**
Preferred Alternative - Pine Valley (a) transmission line route (long-term disturbance area)	179.1	n/a	**270**	**0.8%**

Source: EDAW, Inc. using GIS analysis. MWP – Mt. Wheeler Power Co., NB – Nevada Bell, WC – Williams Communication, IPC – Idaho Power Company, DOE – Department of Energy

** Does not including proposed TL for purposes of comparison. Total build-out of the corridor would be 3-4 TLs.*

As shown in Table 4-1, the amount of cumulative disturbed area in the project area from past, present, and future actions having similar impacts to the Falcon to Gonder project is estimated to be 33,620 acres. This figure does not distinguish type and degree of disturbance nor amount of vegetative recovery from past projects. However, it provides a gross depiction of the relative amount of aerial disturbance to which the project would contribute cumulatively. By comparison, after construction and revegetation, the Falcon to Gonder transmission line would contribute approximately 270 acres of disturbance or less than 1% of the total amount of cumulative disturbed area when considering the entire corridor.

4.2.1 PAST ACTIONS

Relevant past actions in the project area include transmission and fiber optic lines, mining operations, as well as major roads and railroads, are described below.

TRANSMISSION/FIBER OPTIC LINES

- 345 kV transmission line (SPPC) heading east-west to the Falcon substation (Valmy to Falcon).
- 120 kV transmission line (SPPC) heading east-west from the Falcon substation .
- 60 kV transmission line (SPPC) heading north from the Falcon substation.
- 120 kV, 69 & 25 kV (SPPC) transmission lines from Falcon substation heading south to Cortez Mine.
- 69 kV transmission line (SPPC) from Cortez Mine south to Tonkin Spring.
- 230 kV transmission line (SPPC) east-west roughly paralleling US Highway 50 to the Gonder substation.
- 69 kV transmission line (Mt. Wheeler Power Company) from Mackcheck substation east and then north toward Buck Mountain.
- 69 kV transmission line (Mt. Wheeler Power Company) from Gonder substation north along I-93.
- Fiber optic line (Williams Communication) east-west along I-80 right-of-way.

MINING

- 14 existing mines within the Cortez Mining District, which have disturbed approximately 7,000 acres. Other related exploration activities have disturbed another 1,800 acres (South Pipeline Project FEIS, 2000).
- 8 mines within the Bald Mountain / Buck Mountain mining area have caused approximately 2,400 acres of disturbance in 1995 (Bald Mountain Mine Expansion Project FEIS, 1995).
- Mining in the Eureka area, including the Homestake Mine and the Ruby Hill project involved approximately 800 acres of disturbance (Ruby Hill Project FEIS, 1997).
- Other mining-related disturbances, including numerous historic operations, are widely spread throughout the project area and cannot be accurately quantified in terms of acres of disturbance.

AIRPORTS

- Eureka Municipal Airport with a runway of 7300 feet in length (USDOT – FAA, 1999).
- White Pine County Airport (Yelland Field, Ely) with two runways, 6000 and 4800 feet in length (USDOT – FAA, 1997).

ROADS/RAILROADS

- Interstate 80 heading east-west through the northern portion of the project area.
- US Highway 50 heading east west through the southern portion of the project area.

- State Highway 278 heading north-south, connecting Carlin with Eureka in the approximate center of the project area.
- State Highway 892 heading north-south, connecting Elko with Eureka in the approximate center of the project area.
- State Highway 306 heading north-south, connecting Beowawe with Interstate 80, on the western portion of the project area.
- US Highway 93 heading north-south on the far eastern portion of the project area, and adjacent to the Gonder substation
- Union Pacific Railroad heading east-west, roughly paralleling Interstate 80 in the northern portion of the project area.
- Nevada Northern Railroad heading north-south roughly paralleling US Highway 93 to the east of the Gonder substation.

4.2.2 PRESENT ACTIONS

Present actions include projects for which applications have been submitted to the BLM and other agencies and that are in various stages of the approval/permitting process.

Project Name: Sierra Pacific Communications Fiber Optic Project - Reno, Nevada to Salt Lake City, Utah (also known as the Silver State East Project).
Project Description: The proposed fiber optic project consists of construction, operation, and maintenance of a buried cable between Reno, Nevada and Salt Lake City, Utah, along the US Highway 50 right-of-way in the project area. The route would connect two existing metro loops – the Verdi to Reno loop on the west end and Salt Lake City to Brigham City, Utah on the east end.
Location: Reno, Nevada, to Salt Lake City, Utah.
Status: Application submitted to BLM on March 30, 2000. Will be constructed in 2001 if approved.

Project Name: Sierra Pacific Fiber Optic Communication Project – Silver State South.
Project Description: The proposed fiber optic project parallels existing U.S. and State highways to connect the Carson City and Las Vegas areas.
Location: Carson City, Nevada, to Las Vegas, Nevada.
Status: Application submitted to BLM on March 7, 2001.

Project Name: Nevada Bell Fiber Optic Project - Newark Valley to Cherry Creek, Nevada.
Project Description: Installation of a fiber optic cable to improve and upgrade the existing telecommunication services within the eastern region of Nevada. The cable would replace obsolete telecommunication equipment to provide for future growth and improve services in the area. From Newark Valley to the Mormon Ranch in Jakes Valley, the cable would be constructed underground adjacent to and within existing roadways or two-track roads. From the Mormon Ranch, across the Egan Range, to the pole line road located just outside of Ely, Nevada, the cable would attach aerially on existing power poles owned by Mt. Wheeler Power Company. From the pole line road, located in Section 28, Township 17 North, Range 63 East, the cable would be placed underground and adjacent to existing county or state roadways until it terminates at Nevada Bell's existing radio site in Ely. Length of the total project is approximately 75.2 miles.
Location: Newark Valley, Long Valley, Jake's Valley and Steptoe Valley in White Pine County.
Status: Project approved, grant issued April 27, 2000.

Project Name: Nevada Bell Fiber Optic Project – Ely to Cherry Creek.
Project Description: Construction of a 67 mile-long underground fiber optic communication line.
Location: White Pine County.
Status: Grant issued July 25, 2000.

Project Name: Nevada Bell Fiber Optic Project – Cold Creek to Fish Springs Valley.
Project Description: Construction of a 40 mile-long underground fiber optic communication line.
Location: White Pine County.
Status: Grant issued February 12, 2001.

Project Name: Nevada Bell Fiber Optic Project – Ely to Sunnyside.
Project Description: Construction of an 80 mile-long fiber optic communication line aboveground along an existing telephone line. This has not been included in Table 4-1 as it would create little in the way of ground disturbance.
Location: White Pine County.
Status: Grant issued February 12, 2001.

Project Name: Cortez South Pipeline Project (BLM 1999a).
Project Description: Expansion of the Pipeline open pit gold mine milling and heap leaching operation, expansion of the rock dump and tailings facility, use of a water pipeline to deliver irrigation water to the Dean Ranch, and extension of process solution pipelines from South Pipeline leach facility to other process facilities within the project area. Surface disturbance of 4,450 acres of public land.
Location: Lander County, Crescent Valley.
Status: FEIS Record of Decision (ROD) and Plan of Operations Approval released in June 2000.

Project Name: Cortez Joint Venture Horse Canyon Exploration Project (BLM 1999b).
Project Description: Cortez Joint Venture minerals exploration project that is expected to disturb approximately 50 acres of BLM lands in the Pipeline/South Pipeline Cortez Mine Site (near Highway 306). The site extends into the BLM's Battle Mountain and Elko Field Offices.
Location: Crescent Valley in Lander and Eureka counties.
Status: Environmental Assessment released October 1999.

4.2.3 REASONABLY FORESEEABLE FUTURE ACTIONS

The following projects are those that have been approved and/or are currently being discussed in the public realm and have a reasonable likelihood of being implemented. These include an approved Idaho Power Company transmission line project and its related utility corridor, the potential Yucca Mountain rail project being proposed for transportation of nuclear waste, and other mining, airport expansion, and infrastructure projects. These projects are summarized below

UTILITY LINES

Project Name: Southwest Intertie Project (SWIP) and RMP Utility Corridor Amendment.
Project Description: Proposal by the Idaho Power Company (IPC) to construct, operate, and maintain a 319-mile long 500 kV transmission line through Nevada, Utah, and Idaho. Related BLM Resource Management Plan amendments designating a new utility corridor and right-of-way approvals have already been completed.

Location: Nevada, Utah, and Idaho. Midpoint Station near Shoshone, Idaho to northeast Las Vegas, Nevada (Midpoint to Dry Lake segment), and between a proposed substation in the Ely, Nevada area and a proposed substation Delta, Utah (Ely to Delta Segment). In the project area, one portion of the SWIP utility corridor runs north-south, intersecting the utility corridor also containing SPPC's 230 kV line near US Highway 50 west of Ely, and then running east-west to the Gonder Substation.

Status: The SWIP ROD granted the right-of-way to IPC for a 500 kV transmission line. The current status of this project is unknown, however, as discussions with IPC reveal that their construction of this line as granted is uncertain (personal communication with John Berdrow, SPPC, 2000). A 3 mile-wide utility corridor has been approved by the BLM, and the ROW grant was extended in December 1999.

Project Name: Coastal Corporation Power Plant and Natural Gas Pipeline, Elko, Nevada.

Project Description: Proposal by Coastal Corporation to construct a power plant and natural gas pipeline to serve future industrial growth in northeast Nevada, and potentially, energy demand in the western United States. This project has not been included in the estimated acres of disturbance (Table 4-1) as it is too speculative and has no specific location at this time.

Location: The pipeline would extend from Utah to Carlin and/or Elko, Nevada.

Status: No formal application has been submitted to the BLM. However, this project has been discussed in local newspapers as a potential energy project.

Project Name: Nevada Bell Fiber-Optic Projects

Project Description: Nevada Bell is exploring two potential fiber-optic projects in north-central Nevada.

Location: One fiber-optic project would be in Crescent Valley and one in Diamond Valley, Nevada. The projects are in a preliminary planning stage and exact locations are not yet determined.

Status: No formal applications have been submitted to the BLM. However, Nevada Bell has held pre-application meetings with BLM to discuss these two potential fiber-optic projects.

MINING

Project Name: Cortez Joint Venture Pediment Mine Project

Project Description: Proposal for Cortez Joint Venture open pit mining operation that is expected to disturb approximately 1,766 acres of BLM lands in the Pediment Mine Site off County Road 225 near Cortez canyon. The site is within the jurisdiction of the BLM's Battle Mountain Field Office. Potential conflicts with the Crescent Valley route alternatives are yet to be determined.

Location: Crescent Valley in Eureka County.

Status: The plan of operations was submitted to the BLM on 1/8/01; NEPA scoping process not yet initiated.

AIRPORT

Project Name: White Pine County Airport ILS.

Project Description: Proposal by White Pine County to extend N/S runway northward in the direction of the existing transmission line corridor by as much as 6,000 feet to accommodate expanded commercial service. Other components of the proposal include development of BLM fire base and aircraft maintenance facilities. Preliminary cost estimates and funding requests have been accepted by the FAA Airport Capital Improvement Program (ACIP) for 2001 and 2002.

Location: White Pine County Airport (Yelland Field) located approximately 3 miles north of Ely.

Status:. No formal applications or final commitments for funding have been made. BLM lease agreements will need to be negotiated by FAA, once approved.

Project Name: Eureka County Municipal Airport, Eureka, Nevada.

Project Description: Preliminary cost estimates and funding requests for construction of a crosswind runway have been documented in the FAA Airport Capital Improvement Program (ACIP) for 2005.

Location: Eureka Municipal Airport located approximately 6 miles north of Eureka , Nevada.

Status: This project has not been included in the estimated acres of disturbance (Table 4-1) as it is too speculative and no specifications for the proposal are available at this time.

RAILROAD

Project Name: Yucca Mountain Branch Rail Line Project.

Project Description: The U.S. Department of Energy is studying Yucca Mountain, Nevada, to determine its suitability as a place to build a geologic repository for the nation's commercial and defense-related spent nuclear fuel and high-level radioactive waste. If a repository were built at Yucca Mountain, shipments of spent nuclear fuel and high-level waste would arrive in Nevada by train and/or truck. One option for train shipments evaluated in the Draft EIS is for the Department to build a branch rail line to the repository that would connect from an existing main rail line in Nevada. One of many potential rail corridors evaluated in the EIS, the Carlin potential rail corridor, would be in the Falcon-Gonder project area. This rail line would be constructed from an existing rail line at Beowawe and would roughly parallel State Highway 306 in Eureka County, heading southwest to Yucca Mountain. If constructed, the line would intersect Segment B of the Falcon to Gonder project near the town of Crescent Valley.

Location: Beowawe to Yucca Mountain, Nevada (portion within CISA includes approximately 82 miles to the southwest from the Beowawe terminus).

Status: In late 2001 or early 2002, the Secretary of Energy is scheduled to make the decision whether to recommend Yucca Mountain to the President as the repository site for highly radioactive materials. It is uncertain when plans for repository shipments will be finalized. If the Nuclear Regulatory Commission eventually issues licenses to construct and operate a repository, the earliest a repository would be ready for waste emplacement is 2010.

PROPOSED UTILITY CORRIDOR (RMP AMENDMENT)

SPPC currently has no plans to construct additional transmission lines or fiber optic lines in the Falcon to Gonder corridor. However, it is reasonable to assume that other utilities may wish to install long-distance transmission lines, fiber optic lines, and natural gas or oil pipelines in the same utility corridor next to the proposed project by 2043 to serve the growing western region. This cumulative impacts analysis examines the possibility that 3-4 transmission lines could be constructed in the utility corridor (including the proposed Falcon to Gonder project) if the BLM amends the related Resource Management Plans to designate a new utility corridor. However, this is an extremely conservative "worst-case type" assumption made for purposes of this analysis. The actual use of this utility corridor for additional transmission lines in the future is uncertain and speculative.

ROAD CONSTRUCTION AND MAINTENANCE

While neither the Nevada Department of Transportation nor local county public works departments have plans to construct new major roads in the project area, these entities do plan on continued maintenance and upgrading of the existing roadway infrastructure. It is also reasonable to assume that smaller, private roads would be constructed within the project area to serve a growing region. These potential future projects would likely be constructed by private developers extending new local access

roads to future development, or upgrading existing dirt roads to higher standards. Due to the speculative nature of such activities and the absence of actual physical plans, potential land disturbance from future local road construction and maintenance activities cannot be quantified at this time.

4.3 EVALUATION OF POTENTIAL CUMULATIVE IMPACTS

Environmental consequences of the proposed action (i.e., approval of the Falcon to Gonder project and associated BLM Resource Management Plan amendments) are analyzed in Chapters 3 and 5. The following provides an analysis of potentially significant cumulative impacts related to the proposed action when viewed in conjunction with other past, present, and reasonably foreseeable actions in the CISA. This analysis considers the anticipated contribution that the preferred route of the Falcon to Gonder project would have to cumulative impacts after the mitigation measures described in Chapter 3 are implemented.

4.3.1 GEOLOGY AND MINERALS

Consistent with the analysis in Chapter 3, the project would contribute cumulatively to grading and topographic alteration in the study area and region. Highways, roads, and railroads in the vicinity of the project also present significant topographic alteration because of the need to establish appropriate grades and radii of curvature. While the amount of grading and topographic alteration from the mines, quarries, roads, and railroads is not quantified, the general indicator of cumulative landscape alteration (33,620 acres), as shown in Table 4-1, suggests that together they present much greater topographic alteration than that associated with the project (270 acres in total).

The project would require minor grading at isolated localities, mostly at small sites for support tower pads and local dirt access roads located on steeper slopes in the hills and mountains. But none of the large cuts and fills typically associated with mining and transportation corridors would be needed for the transmission project nor are likely for other utilities in the proposed utility corridor (unless major roads were co-located in the corridor, which is not likely for the entire corridor). Future mines and new roads in the cumulative impact study region may be of substantial size in the new designated utility corridor and result in substantial changes in topography; however, their impact is speculative. Other transmission lines in the corridor would be expected to have similar effects on topography and disturbance to those of the project. In considering the existing amount of topographic alteration and the potential future topographic alteration, the project would represent a small amount of change in the topography and would not contribute substantially to cumulative topographic impacts and the cumulative impact is deemed less than significant.

Geologic hazards (e.g., earthquakes, landslides, and unstable slopes) are present throughout the region but are expressed locally. Cumulative development results in exposure of people and property to these hazards. The impact is notably associated with mines and transportation systems both for construction and long-term operation. Cumulative development in the proposed utility corridor would have geologic hazards generally similar to those of the project. As additional power transmission and utility lines would be co-located with the Falcon to Gonder project, the impact would be similar. However, additional utility line development, roads, and rail lines would not result in additive hazards because of requirements for adequate spatial separation of the buried and above-ground facilities. Therefore, the cumulative impact would be less than significant. Other developments in the cumulative impact study area would represent a substantial exposure of property and people to geologic hazards. However, as the hazards are site-specific, the project would not have additive effects.

The preferred alternative (Pine Valley (a) route) would pass near but not directly conflict with a number of small mines and aggregate quarries that are scattered along the alignment. Like the proposed project, future projects in the 3-mile utility corridor could strategically locate facilities and/or work with mining companies to avoid conflicts with existing large scale mining operations and address impacts to active mining claim holders on a case-by-case basis. Similar measures could be taken to address potential conflicts with existing gas, oil and geothermal resource facilities and lease holders. Thus, cumulative impacts to geology and mineral resources are deemed less-than-significant.

RESIDUAL IMPACT

Mitigation measures discussed in Section 3.1, Geology and Minerals, would help reduce residual impacts to a less-than-significant level.

4.3.2 SOILS

Construction of the Falcon to Gonder project and designation of the new utility corridor through the RMP amendments could facilitate the construction of additional utility lines and infrastructure projects in the corridor. Cumulative impacts related to soil erosion and compaction would occur in disturbance areas shared by this and other projects. Cumulative impacts on soils would occur from the Falcon to Gonder project in conjunction with other actions in the study area and future projects that may locate in the utility corridor. Cumulative impacts would include:

- Increased soil erosion and soil compaction,
- Disturbances to downstream resources by erosion and sedimentation, and
- Decreased potential for revegetation/reclamation success.

These impacts would occur for other projects constructed within the proposed utility corridor and in the immediate vicinity. Additionally, other projects in the region represent dispersed sources of past, existing and future soil erosion, depending on local environmental conditions. Mining projects, especially old abandoned mines and roads, are subject to significant erosion. The impacts of the Falcon to Gonder project would be less than significant by implementing Mitigation Measures Soil-1 through Soil-4 and reclamation success criteria to be provided in the COM Plan, as applicable. Other projects within the proposed utility corridor or in other parts of the cumulative impact study area would have a similar or greater potential for soil erosion and compaction. It is expected, although not assured, that new projects would be substantially reduced sources of soil erosion because of current and future requirements for erosion control and site restoration enforced through federal, state, and local permits. Therefore, the cumulative impacts of the project and plan amendments on erosion are primarily the additive effects of minor increments to existing soil erosion problems in the cumulative impact study area. For this reason, the cumulative impacts of the Falcon to Gonder project and plan amendment would be considered less-than-significant. Additional mitigation is not required.

4.3.3 WATER RESOURCES

Construction of the Falcon to Gonder project and designation of the new utility corridor could facilitate the construction of additional utility lines and infrastructure projects in the corridor. Impacts on water resources similar to those described in Section 3.3 would generally be expected to occur for other projects within the corridor and in the immediate vicinity. These include:

- Potential spills and contaminant discharges during construction;

- Sediment discharges in watercourses from construction;
- Obstruction and alteration of watercourses;
- Increased runoff from soil compaction, possibly affecting flood flows;
- Construction activities affecting the flow of springs and wells; and
- Flood and flash flood hazards to structures.

Mining projects in the immediate vicinity would have substantially greater potential impacts on surface waters and groundwater resources and have substantial potential for discharge of contaminants into water bodies. Cumulative impacts related to contaminant and sediment discharges, soil compaction, and associated runoff effects would occur in disturbance areas shared by this and other projects. Highways, roads, and railroads in the vicinity of the project also present significant environmental disturbance and potential for contaminant discharge because of grading and regular deposition of vehicle contaminants (e.g., fuel, fuel additives, oil, solvents, metals, rubber and others) on road surfaces, as well as occasional accidental spills of hazardous materials. The general indicator of cumulative landscape alteration(,as shown in Table 4-1, suggests that together these developments present much greater potential for discharges into water courses than that associated with the project. It is assumed that new project construction would be required to meet federal, state, and local permit requirements, as described for the Falcon to Gonder project, including many of the mitigation measures identified in Section 3.3. Therefore, the cumulative contribution of the project to impacts in those categories would be less-than-significant.

The potential exists for other projects in the cumulative impact study area to affect groundwater resources, including the flow of springs and wells. The impact would be highly variably depending on the type and configuration of the project and its relation to local groundwater resources. While a potential for adverse impact is present, the effect is speculative and would have to be evaluated for each project. In general, mining projects have the most substantial potential to significantly affect groundwater resources both through direct use of water and interception of the groundwater table. Land development and agriculture also may draw heavily on local water resources. In contrast, highways, transmission and utility lines, roads, and railroads likely would have little effect on use of groundwater resources except briefly during construction, as described in Section 3.3. Because mitigation is included in the Falcon to Gonder project, as assumed for other new projects, the impact to groundwater resources is considered to be less-than-significant.

Other projects also may contribute to hazards to people and facilities from construction in flood and flash-flood hazard areas. The hazard is local in nature and would only affect individual projects or parts of them; therefore, no additive effects would be expected. In addition, it is assumed that new facility construction would be designed to have an acceptable level of risk against flooding and flash flooding. For these reasons, the cumulative impact of the Falcon to Gonder project on flooding and flash flood hazards is deemed to be less-than-significant.

4.3.4 VEGETATION

Construction of the Falcon to Gonder project and designation of the new utility corridor through the RMP amendments could facilitate the construction of additional utility lines and infrastructure projects in the corridor. Cumulative impacts on vegetation resources would occur from the Falcon to Gonder project in conjunction with other actions in the study area and future projects that may locate in the Falcon to Gonder utility corridor. Cumulative impacts would include:

- Reduction in reclamation success.

- Increased disturbance (e.g., cheatgrass invasion) of plant communities.
- Indirect effects from the increase in human activity in the area.

Concentrating multiple utility lines and other linear infrastructure projects within a designated corridor could cause increased cheatgrass invasion (see 4.3.5, Invasive, Nonnative Species, below), indirect effects of increased human activity, and reduction in reclamation success in the corridor. Regardless, it is preferable to the disturbance that would be associated with the proliferation of utility lines in largely undisturbed areas. However, all RMPs and the FLPMA permit ROWs outside of utility corridors. Cumulative impacts to plant communities would be considered adverse, but not significant. After construction and revegetation, the preferred alternative would account for less than 1% of the total cumulative disturbed area (see Table 4-1). The project's contribution to potentially significant cumulative vegetation impacts would be less-than-significant after mitigation, providing that other projects apply similar mitigation and reclamation measures to those proposed in this EIS and do not contribute substantially to losses of what are currently largely undisturbed and regionally common and widespread plant communities.

4.3.5 INVASIVE NONNATIVE SPECIES

Cumulative impacts related to invasive native species, including noxious weeds and cheatgrass, would occur from the Falcon to Gonder project in conjunction with other actions in the study area and future projects that may locate in the Falcon to Gonder utility corridor. Cumulative impacts would include introduction and dispersal of invasive weeds during construction, operations, and maintenance of existing and future projects.

Concentrating multiple utility lines and other linear infrastructure projects within a designated corridor could cause increased introduction and dispersal of invasive weeds in and adjacent to the corridor. Cumulative impacts related to invasive weeds would be considered adverse, but not significant. The impacts would be reduced by implementing mitigation measures similar to those identified in Sections 3.4, 3.5, and Appendix E of this EIS.

4.3.6 WILDLIFE AND WILDLIFE HABITAT

Cumulative impacts on wildlife and wildlife habitat would occur from the Falcon to Gonder project in conjunction with other actions in the study area and future projects that may locate in the Falcon to Gonder utility corridor. Cumulative impacts would include:

- Temporary removal of habitat and displacement of wildlife species.
- Indirect effects from the increase in human activity in the area.
- Habitat fragmentation.

While concentrating multiple utility lines and other linear infrastructure projects within a designated corridor could cause habitat fragmentation, it is preferable to cluster habitat disturbance as opposed to the proliferation of utility lines and other projects randomly across public lands. Similarly, it is preferable to locate the new utility corridor in areas with existing utility lines, habitat disturbance, paved roads, and human activity rather than in areas that are more remote. Additionally, the project would account for less than 1% of the total disturbed area in the cumulative impact study area. It may be assumed that future projects in the utility corridor would be subject to equivalent mitigation requirements as those of the Falcon to Gonder project. Thus, cumulative impacts associated with the Falcon to Gonder project and designated utility corridor would be considered less-than-significant after mitigation.

In evaluating future projects in the corridor, BLM should encourage project proponents to locate new projects as close as safely possible to existing rights-of-way to minimize wildlife impacts. It may also be beneficial to narrow the utility corridor in sensitive areas such as those frequented by shorebirds and waterfowl, mule deer and pronghorn seasonal habitats, and migratory corridors.

4.3.7 SPECIAL-STATUS SPECIES

Cumulative impacts on special status species would occur from the Falcon to Gonder project in conjunction with other actions in the study area and future projects that may locate in the Falcon to Gonder utility corridor. Special-status species that could be subject to cumulative impacts include:

- Pennell draba (*Draba pannellii*)
- Western sage grouse (*Centrocercus urophasianus*)
- Ferruginous hawk (*Buteo regalis*)
- Western burrowing owl (*Athene cunicularis hypugea*)
- Pygmy rabbit (*Brachylagus idahoensis*)

The types of cumulative impacts associated with special-status species would be similar to those described above for wildlife and wildlife habitat. However, because of their rarity, similar effects can have more significant consequences for special-status species and their habitats. Therefore, it is even more critical to locate future rights-of-way such that they avoid sensitive species and their habitats and/or as close together as possible to minimize impacts.

❑ ***Cumulative Impact Species – 1: Possible Disturbance of Special-Status Plant***

Construction of the Falcon to Gonder project and designation of the new utility corridor through the RMP amendments could facilitate the construction of additional utility lines and infrastructure projects in the corridor. Future projects in the corridor could potentially impact the Pennell draba plant population that was identified at the Hercules Gap during biological surveys. This impact would be significant but could be mitigated to less-than-significant be the following measure.

❑ ***Cumulative Mitigation Species – 1***

BLM should require future projects in the utility corridor to implement Mitigation Measure Special-Status Species–1 described previously in Section 3.7.

❑ ***Cumulative Impact Species – 2: Habitat Fragmentation and Displacement of Special-Status Wildlife***

Construction of the Falcon to Gonder project and designation of the new utility corridor through the RMP amendments could facilitate the construction of additional utility lines and infrastructure projects in the corridor, which could increase human activity in the area, as well as contribute to habitat fragmentation and displacement of special-status wildlife. Cumulative impacts on special-status wildlife could be significant for the proposed route and utility corridor. The following mitigation would reduce these impacts to less-than significant.

❑ ***Cumulative Mitigation Species – 2***

If practical, coordinate timing of construction to coincide with other projects (such as the fiber optic cable project along US Highway 50) to minimize the length of temporary habitat

disturbance and human activity in the corridor. BLM could also require that future projects in the corridor comply with seasonal timing for species, such as sage grouse and ferruginous hawks.

In evaluating future projects in the corridor, BLM should encourage project proponents to locate new projects as close as safely possible to existing rights-of-way to minimize special-status wildlife impacts. It may also be beneficial to narrow the utility corridor in areas that contain sensitive habitats for sage grouse, ferruginous hawk, western burrowing owl, and pygmy rabbit.

RESIDUAL IMPACT

As with wildlife and wildlife habitat, cumulative impacts would be less-than-significant if these mitigation measures were implemented.

4.3.8 VISUAL RESOURCES

The transmission line as well as other linear projects which may be authorized within a designated utility corridor would substantially alter the visual environment by adding to the visual appearance of other developments, such as existing transmission lines, mines, and roads. This cumulative effect would create a significant and irreversible change to the visual environment.

The Falcon to Gonder project, when viewed in conjunction with other past and present projects of similar scale and magnitude, may also have the potential to exceed the interim and established VRM Class objectives within the cumulative impacts study area (i.e., the 3-mile wide corridor viewshed as seen from 29 key observation points selected for the project). This is especially true of areas classified as either Class II or Class III and in areas with existing transmission line. The management objectives in Class II areas require the retention of the existing natural landscape, and activities should not attract attention of the casual viewer. In Class III areas, the objective is to partially retain the existing natural landscape. Activities can attract attention but should not dominate the landscape.

The designation of a new utility corridor could facilitate the concentration of additional transmission lines or other major linear projects in this area, potentially creating a visual contrast that would exceed these objectives. Although designation of utility corridors and co-locating utility lines are planning techniques employed by the BLM to mitigate cumulative impacts and avoid the proliferation of transmission lines across public lands, the visual contrast created by this and other past, present and future actions may potentially exceed the applicable management objectives. The proposed action's contribution to these cumulative adverse visual impacts would be considerable.

The project as proposed (prior to applying mitigation measures) would result in significant impacts to visual resources along Segments B, D, E, and H, due to inconsistencies with BLM's established visual resource management objectives. Therefore, it is reasonable to assume that the proposed action, in conjunction with past, present, and reasonably foreseeable future actions, would have similar effects on established VRM Classes and result in additive significant cumulative impacts.

❑ ***Cumulative Impact Visual-1***

Construction and operation of the Falcon to Gonder transmission line and designation of a contiguous utility corridor in related BLM Resource Management Plans may facilitate the construction of other linear projects within the corridor. This would create a visual contrast that would cumulatively exceed the interim and established VRM Class objectives within the utility corridor. The preferred alternative would also contribute to the widespread and growing regional disturbance of the visual quality of the landscape through highly visible developments, especially other transmission lines, roads, and mines. Many of the KOPs discussed above would

be affected on a region-wide basis. This would be a significant cumulative impact. However, it should be noted that there is no certainly that other projects will be built in the corridor, and this analysis is speculative.

- ***Cumulative Mitigation Visual-1***
  The BLM's Visual Resource Contrast Rating system should be utilized to analyze potential visual impacts associated with future projects proposed within the corridor for consistency with the established VRM Class objectives. Mitigation measures should be developed for each future project to minimize the visual contrast to a level that is consistent with the established management classes.

RESIDUAL IMPACT

The mitigation measures listed above and in Section 3.9 would reduce, but not entirely eliminate, the project's contribution to cumulative visual impacts. The proposed action's contribution to potentially significant cumulative visual impacts could remain considerable after mitigation, mainly due to the new BLM utility corridor designation.

4.3.9 PUBLIC HEALTH AND SAFETY

The proposed transmission line combined with potential future facilities in the designated utility corridor would additively increase EMF, hazardous materials, and fire hazards in the study corridor. People living and working near the corridor, as well as those people driving on nearby roads and working in mines, could potentially be impacted. However, the facility designs, clearance requirements, and distance separations for adjacent transmission lines would reduce these potential cumulative impacts to a less-than-significant level. Generally, utilities place parallel transmission lines and other utilities an adequate distance apart so that if one is damaged or disabled, the others are not automatically affected. The use, storage, and disposal of hazardous materials for this and other projects in the study area are subject to federal, state, and local hazardous materials health and safety laws.

In addition, mining operations and roads create their own hazards, in the form of mining accidents, exposure to hazardous substances at mining sites, and roadway accidents. The Falcon to Gonder project would not likely compound these existing hazards or future hazards when new or expanded mines and roads are constructed. While wildfires are common in the region, this project is not anticipated to contribute to a significant cumulative fire hazard, as SPPC would implement fire prevention and response measures such as those contained in Appendix F. This and other projects on public lands would also be subject to federally enforced fire laws and regulations.

From a regional perspective, the cumulative effects would be similar to those described above, but would have a wider area of distribution. The project's cumulative impact would be small in comparison to the hazards that exist in the wider region due to its remote location. Some of the projects considered in this cumulative analysis are located in more populated areas, potentially exposing greater hazards for people and property. The Falcon to Gonder project and the proposed utility corridor generally pass through sparsely settled areas and, therefore, do not add substantial new or additional hazards to people and property. Therefore, the cumulative impact of the proposed action is considered less-than-significant.

4.3.10 CULTURAL RESOURCES

The proposed action would contribute cumulatively to disturbance of cultural resources in the study area and region. Subsurface disturbance has the greatest potential to directly affect NRHP-eligible cultural

resources sites, especially buried prehistoric resources. The general indicator of cumulative disturbance (33,620 acres), as shown in Table 4-1, suggests that together, these past, present, and future projects present much greater disturbance of land than that associated with construction of the preferred alternative (2,172 acres, which is a worst-case estimate as explained in Chapter 2). Future projects in the cumulative impact study area may be of substantial size in the newly designated utility corridor and result in substantial disturbance of soils; however, their impact is speculative. In consideration of the existing amount of subsurface disturbance and the potential for future disturbances, the project itself would represent a small amount of change and would not contribute substantially to cumulative impacts.

However, given the numerous NRHP-eligible cultural resources along the preferred alternative route, the designation of a utility corridor in this location has the potential to cause significant cumulative impacts to known, as well as unknown, cultural resources. The impacts would be similar to the proposed project, and would include: (1) direct surface or subsurface disturbance of cultural resources incurred during construction, maintenance, or operation of the Falcon to Gonder project and other projects; (2) indirect effects such as increased traffic and accessibility to the sites; and (3) indirect visual effects to significant historic sites and TCPs. The designation of this corridor could facilitate the construction of other major linear projects in this area, creating a pattern of continued disturbance to cultural resources[1]. This is considered a significant cumulative impact.

Mitigation measures to avoid or substantially reduce cumulative effects should include: (1) data recovery on a sample of sites, (2) protection of sites during construction, and (3) long-term monitoring.

❑ ***Cumulative Impact Cultural - 1***

Construction of the Falcon to Gonder project and designation of a contiguous BLM utility corridor may lead to the concentration of other linear projects within the corridor. Improvements to local access roads may also lead to increased disturbances to archaeological sites. Thus, the Falcon to Gonder project could contribute to significant cumulative impacts on cultural resources in the study area.

❑ ***Cumulative Mitigation Cultural – 1***

Data Recovery: A sample of sites susceptible to indirect or cumulative effects shall be subject to data recovery efforts. These sites shall be selected from those NRHP-eligible sites along the selected route that would not otherwise be treated for direct impacts. Not all sites shall be included in a sample, but the sites selected will have potential to address the research questions posed for the project and a variety of issues. Sites eligible for the NRHP subject to cumulative or other indirect impacts not included in the sample shall receive no additional protection or consideration after completion of construction, although during construction some protective fencing and direction to construction crews should lessen direct impacts. Sites included in the sample to receive data recovery efforts may be distributed among the three BLM Field Offices in the project area. A sample of 20-25% of significant sites along the route (plus a 10% sample of significant sites along access roads) is considered to constitute an adequate sample, the total to include those directly affected sites. The prehistoric site types used to summarize inventory results will serve as a framework for selection of the indirect/cumulative impact site sample for prehistoric sites, while function will be the basis for selection of the historic sites.

Historic and prehistoric sites will be represented in the treatment sample in proportion to their representation in the overall site population. Since effects to these sites are not confined to particular areas, (i.e., the portions of sites most susceptible to collection or vehicular disturbance

[1] Since Segments I and J are currently within a designated utility corridor, selection of these segments would not contribute to the proliferation of additional utility corridors.

is not entirely predictable), excavation may be undertaken in any area of the sites involved, where the route is adjacent to public lands.

Protection of Sites During Construction: As warranted, known significant archaeological sites along the selected route, which are not otherwise receiving mitigation through data recovery, will be protected from disturbance during construction through fencing and monitoring as discussed in the COM Plan and the HPTP. Some locations, however, may be too difficult to access (i.e., steep, mountainous areas); it may not be necessary to fence or monitor all sensitive locations.

Signage: Cultural resource protection signs (e.g., labels pasted to Carsonite posts) will be posted on major roads near the project area. These would not be placed at or near sites, so as not to draw people to the sites.

***Long-Term Monitoring*:** SPPC shall initiate a long-term monitoring program which will accomplish two goals: (1) to provide monitoring of cumulative impacts for this project, and (2) to provide data which can be used in the future to evaluate the impacts that increased accessibility may have on the inadvertent and deliberate disturbance of archaeological data on similar projects.

Five to ten archaeological sites will be selected for monitoring. These will be sites not otherwise subjected to data recovery that are near the centerline of the project, and not in any areas slated for direct disturbance. These sites must exhibit relatively stable surfaces (i.e., they are not located in either erosional or depositional settings). The sites will be distributed on public lands (to avoid potential conflicts with private landowners) among the three BLM Field Offices within the project area. At 6-month intervals for a term of 5 years, these sites will be revisited and boundaries and debitage densities or debris scatters will be compared to those noted in previous recordings. This will control for natural factors which may affect the sites as a whole since illegal artifact collection by site visitors is usually focused on recognizable or attractive formed tools such as projectile points, debitage, and historic bottles rather than entire scatters. Diagnostic or other formed tools and historic bottles, coins, or antique collectibles will be remapped to determine whether unauthorized collection has take place. This mapping will use sub-meter accuracy GPS recording. The locations will be compared to that from previous recordings. Letter reports will be submitted to the appropriate BLM Field Offices at the time of each monitoring event.

At the end of the 5-year monitoring program, a report describing the monitoring program that evaluates the degree of unauthorized collection will be prepared. The report will compare more and less accessible areas, and will be published in a professional journal available to other researchers. Suggested publications are the Journal of Field Archaeology, Lithic Technology, Journal of California and Great Basin Anthropology, or CRM magazine.

RESIDUAL IMPACT

Implementation of Cumulative Cultural Mitigation–1, including data recovery on a sample of 20-25% of all significant sites (plus a 10% sample of significant sites along access roads), protection of sites during construction, and long-term monitoring would reduce residual impacts to relatively minor levels. The HPTP describing mitigation of direct, indirect, and cumulative impacts will be approved by the BLM, after consulting with the Nevada SHPO and as appropriate, with Native Americans. As a result, the HPTP will be used to apply the most appropriate mitigation measures and to reduce residual impacts to the greatest extent possible.

4.3.11 NATIVE AMERICAN CONCERNS

The Falcon to Gonder transmission line when viewed in conjunction with other utilities that may be authorized in the utility corridor may cumulatively impact ethnobiotic resources of concern to Native Americans. Specifically, direct disturbance to medicinal plants or restricted access to these plant locations could be more widespread in the corridor. To reduce this potential impact, subsequent environmental review of future projects in the corridor should implement Mitigation Measure Native Concern–1, requiring oral interviews with tribal traditionalists to identify potential areas of concern.

From a regional perspective, the Falcon to Gonder project would be viewed as adding to the destruction of aboriginal territory by the Native Americans (and others). However, co-location of utilities would reduce the potential for more widespread disruption of pristine or minimally altered portions of this territory. In addition, the project's level of disturbance would represent a small amount of change in the regional landscape, as shown in Table 4-1. For these reasons, the cumulative impact on Native American concerns from a regional perspective is deemed less-than-significant.

4.3.12 LAND USE AND ACCESS

The Falcon to Gonder transmission line, when considered with other future projects that may be authorized in the utility corridor, could have a cumulative effect on land use by permanently removing land from certain uses, such as residential development, farming, etc. in the immediate rights-of-way. It would commit land uses in the utility corridor to ones that are compatible with utilities. However, given the sparsely developed nature of the area and the extent of open space within the proposed 3-mile wide utility corridor that would allow future facilities to be located to avoid land use conflicts (e.g., with large scale mining operations or airport expansions), cumulative impacts to land use and access would be less than significant.

On a regional basis, cumulative acres of disturbance (33,620 acres), as shown in Table 4-1, suggests that disturbance to land, and therefore disruption of land uses, would be much greater than that associated with the project (270 acres), which is less than 1% of the total change. As such, the project would represent a small amount of change in the regional land use and would not contribute substantially to cumulative land use impacts. For these reasons, the cumulative impact on land use from a regional perspective is deemed less-than-significant.

4.3.13 RECREATION/WILDERNESS

No impacts to recreation or wilderness were identified in Chapter 3. However, the Falcon to Gonder transmission line, when viewed in conjunction with other utilities that may be placed in the utility corridor, could cumulatively diminish the recreational experience, especially for dispersed recreational areas. Future utilities in the corridor would reduce the appearance of undeveloped open space and preclude these areas from possible future consideration as wilderness. The utility corridor also may preclude some forms of dispersed recreational use. However, neither the proposed transmission line nor the utility corridor would traverse the Humboldt-Toiyabe National Forest, the Ruby Lake National Wildlife Refuge, and other prime areas. In addition, the utility corridor would not traverse any wilderness or wilderness study areas. For these reasons, the Falcon to Gonder project would likely have a less-than-significant cumulative effect on recreation/wilderness.

From a regional perspective, the Falcon to Gonder project would have additive effects on recreation, especially in the loss of undeveloped open space, and may restrict some regional recreation opportunities. As shown in Table 4-1, however, the project would represent a small amount of change in the regional

landscape and would not contribute substantially to cumulative recreational impacts. From a beneficial standpoint, the proposed action could help restrict other regional utility developments to the designated utility corridor, potentially safeguarding prized wilderness and wilderness study areas. For these reasons, the cumulative impact on recreation/wilderness from a regional perspective is deemed less-than-significant. No residual impacts are anticipated.

4.3.14 ENVIRONMENTAL JUSTICE

No impacts related to environmental justice were identified in Section 3.18. As such, the Falcon to Gonder project would have no cumulative effects on low income and minority communities.

4.3.15 SOCIAL AND ECONOMIC VALUES

The Falcon to Gonder transmission line and additional utilities in the utility corridor would generate additional tax revenues for local governmental agencies, as well as temporarily increase levels of local employment. These are considered beneficial cumulative impacts. Additional utilities within the corridor could adversely affect land values for some types of adjacent uses (e.g., residential use). Given separation requirements, the speculative nature of these future projects, the sparsely developed nature of the corridor, and the variable state of land market value, these socioeconomic effects are considered less-than-significant and speculative. From a regional perspective, the proposed action could contribute to expanding development in north Nevada and eastern California, provide further economic growth for this region, and provide additional tax revenue for the four-county region.

4.3.16 NOISE

The Falcon to Gonder transmission line and additional utilities in the utility corridor would add to the ambient noise levels, especially in the form of a low-frequency hum of transmission lines during wet or humid weather. Given the sparsely developed nature of the corridor and the few sensitive receptors in the area, the cumulative effects of noise are considered less-than-significant. Transmission line noise decreases quickly with distance away from the line.

From a regional perspective, other uses such as highways, mining, and other developed land uses produce substantially greater noise levels than the Falcon to Gonder project. As such, there would be very little in the form of additive noise levels resulting from the project.

4.3.17 AIR QUALITY

The Falcon to Gonder transmission line and additional utilities in the utility corridor would add to exhaust emissions and particulate during construction periods. As new construction would be staggered over time, dust and other emissions would be dispersed in time and location. The study area is sparsely developed, especially along the corridor, and there are few sensitive receptors in the area. With mitigation to control dust and other emissions, the Falcon to Gonder project would contribute little to local air quality pollution, especially in relation to large emission sources such as mines and vehicle traffic on highways. Therefore, the cumulative effects on air quality is considered less-than-significant.

From a regional perspective, other uses such as highways, mining, and other developed land uses produce substantial emissions of particulate, NOx, CO, and other air pollutants. Long-term operation of the Falcon to Gonder project and other transmission projects would generate almost no direct emissions of air pollutants. Particulate generation from disturbed soils may continue until construction areas are

revegetated. For these reasons, there would be very little in the form of additive air quality effects resulting from the proposed action. Therefore, the cumulative impact is deemed to be less-than-significant.

4.4 SHORT-TERM USE OF THE ENVIRONMENT VS. LONG-TERM PRODUCTIVITY

This section considers the effects of the proposed action which narrow the range of beneficial uses of the environment. The Falcon to Gonder project and the associated RMP amendment to create a utility corridor would result in a long-term commitment of resources along the length of the corridor and at the substations. Because most of the project would be located in sparsely settled rural areas, the transmission project would preclude, but is not expected to significantly affect, existing residential, commercial, and industrial land uses in the vicinity of the transmission line. Stock grazing could continue with minor interruption or impact. Designation of the utility corridor also would preclude future consideration of the corridor area for wilderness, should that occur. Some forms of dispersed recreation may be more limited because of the project and other utilities constructed in the corridor.

Construction of the project, as well as other future projects in the utility corridor, would result in disturbance of the vegetation cover, soil, and wildlife habitat. Most of the area has vegetation cover and habitat common to the region. The proposed action would result in habitat fragmentation and displacement of wildlife, resulting in reduced quality of habitat and related productivity of wildlife populations occupying/using that habitat. Of special concern would be the loss of habitat for special status species including Pennell draba (*Draba pannellii*), Western sage grouse (*Centrocercus urophasianus*), ferruginous hawk (*Buteo regalis*), Western burrowing owl (*Athene cunicularis hypugea*), and pygmy rabbit (*Brachylagus idahoensis*).

4.5 IRREVERSIBLE / IRRETRIEVABLE COMMITMENT OF RESOURES

This section considers the effects of the project which commit resources and uses of the environment that cannot be recovered if the project were constructed. The Falcon to Gonder project and the associated RMP amendment to create a utility corridor would result in construction actions that would permanently alter soil and remove vegetative cover. The Falcon to Gonder transmission line would cause long-term disturbance of approximately 270 acres of land. However, after the useful life of the facility, some of that soil and its vegetation cover would be restored through mitigation identified in this report. The amount of time required to achieve full vegetation recovery would take several years, depending on weather and other conditions, and full recovery is not assured. Wildlife dependent on the affected vegetative habitat would be displaced and possibly experience reduced populations. Similarly, after the useful life of the facility, recovery of those affected wildlife populations, including some sensitive species of plants and animals (see Sections 3.6, 3.7, and 4.1), would take place over several years and full recovery is not assured.

Considering the quantity and quality of NRHP-eligible cultural resources in the project area, both the project and utility corridor have the potential to create irretrievable losses of significant cultural resources if the mitigation measures identified in Section 3.16 are not implemented. Damage or destruction of these resources would be a significant, irreversible loss to our national heritage and scientific understanding.

Construction of the project would require the irretrievable commitment of natural resources from direct consumption of fossil fuels, construction materials, the manufacture of new equipment that largely cannot be recycled at the end of the project's useful lifetime, and energy required for the production of materials.

During the project's operational life, the transmission line would accommodate the transmission of additional electrical power generated from renewable (hydroelectric and geothermal power) and non-renewable resources (natural gas, oil and coal). The use of non-renewable resources at power generation stations would be substantial, but cannot be quantified with available information (see below). This generation likely would occur in areas outside the project area in locations closer to large population centers. The generation of power is evaluated under separate regulatory systems; therefore, the impact is indirect and secondary to the project at hand.

The project is solely a transmission line with attendant facilities and does not include any power generation facilities. Thus, as proposed, there is not direct connection of the project to planned expansion of power plants by SPPC. Moreover, as noted in the Introduction, if Nevada Senate Bill 438 were passed, under energy restructuring SPPC could no longer continue to generate power in Nevada. SPPC would be required to sell its existing Nevada power plants. Thus, there is no impetus for nor direct linkage of the Falcon to Gonder Transmission Project to any proposed new power generation facilities operated by SPPC or Nevada Power in Nevada.

The generation of new power supplies is seen by the Department of Energy as a necessity to meet the growing demand of the increasing population in the western USA. Use of electric energy is projected to increase substantially over the next couple decades in Nevada, in portions of California served by SPPC, and in regions supplied by power through the western grid. The latter includes the service area in Oregon of Portland General Electric, for which SPPC is seeking approval to acquire under separate action from this project. Electric power is generated in diverse forms (from hydro power, fossil fuels, nuclear, geothermal, wind, solar, etc.) at widespread locations through the western US and is directed into the vast interconnected transmission system throughout the western states, and connecting to Canada and Mexico. The project would be a part of that transmission grid. The project itself would not directly result in the construction of new power plants. Given the general status of available supply and the growing demand (particularly during peak demand periods), the construction of new power generating plants, particularly gas-fired plants, seems a likely eventuality. Some of these may be plants constructed in Nevada by other power providers, or they may be constructed in out of state locations that would be the source of power directed to the Falcon to Gonder transmission project. In that respect, the project would accommodate some of the new power generation. Given the widely flung possibilities for interstate power generation and transmission, it would be substantially speculative to conclude that the project would be a direct or indirect catalyst for new power plant construction. In any event, those possible power generation projects have "independent utility", which means that they would require separate approvals from a wide range of federal and state agencies. Those regulatory approvals necessarily would consider the environmental effects of the construction and operation of the plants. It is beyond the scope of this EIS to address all those possibilities and to demonstrate what, if any, connection they might have to the project.

An exception to the preceding conclusion, geothermal energy production development, warrants brief discussion. The project passes through an area with known geothermal energy resources that have been developed in scattered locations of the study area (see Chapter 3.1). The proximity of the transmission line to geothermal areas could increase the potential that those resources might be developed in the future, especially in areas with convenient proximity to the transmission line if it were constructed. The cost to develop transmission facilities is sometimes is the determining factor for the economic viability of geothermal energy development. The same may be equally true for wind and solar energy, or fossil-fuel plants, but unlike geothermal resources, the study area offers no particular advantages compared to other areas of the state for their development in relation to the transmission line. Nonetheless, while increased geothermal development remains a possibility, it is entirely speculation regarding whether the transmission project would be a catalyst for cumulative new geothermal energy development in the study area or elsewhere.

CHAPTER 5

RESOURCE MANAGEMENT PLAN AMENDMENTS

5.0 RESOURCE MANAGEMENT PLAN AMENDMENTS

During early review of SPPC's application, the BLM determined that Resource Management Plan (RMP) amendments would be required in conjunction with approval of a right-of-way grant for the Falcon to Gonder project. Proposals for new uses of federal public lands are evaluated for consistency with the goals, objectives, management actions, and land use designations contained in the relevant RMP(s).

Since portions of the Falcon to Gonder transmission line would extend outside of designated utility corridors[1] and cross a designated low visibility corridor along Interstate-80 (see Figure 5-1), the BLM determined that amendments to relevant RMPs would be required as part of the proposed action. BLM has also decided to amend the Shoshone-Eureka RMP at the same time to delete an existing planning corridor along Highway 305, based on recently obtained information about sensitive resources and wetlands in along the corridor.

The following section describes the proposed RMP amendments, followed by an analysis of the environmental impacts and planning implications associated with adoption of these amendments.

5.1 PROPOSED RMP AMENDMENTS

The Falcon to Gonder route alternatives extend into three different BLM resource areas (i.e., Shoshone-Eureka, Elko and Egan), each with its own RMP and responsible field office. The following describes the amendments that would be required for the various route alternatives:

- **Shoshone-Eureka Resource Management Plan Amendment.** The BLM's Battle Mountain Field Office would designate a new utility corridor up to 3 miles wide (except where constraints exist) along the Falcon to Gonder transmission line route and delete an existing planning corridor near Highway 305 (see Figure 5-1). (This RMP will require amendment regardless of selected Falcon to Gonder route alternative.)
- **Elko Resource Management Plan Amendment.** The BLM's Elko Field Office would designate a new utility corridor up to 3 miles wide (except where constraints exist) along the Falcon to Gonder transmission line route and modify a previous decision and allow the transmission line and new utility corridor to cross the existing "low visibility" corridor along Interstate-80 (see Figure 5-1). (This amendment would be required for any of the Falcon to Gonder route alternatives.)
- **Egan Resource Management Plan Amendment.** The BLM's Ely Field Office would designate a new utility corridor up to 3 miles wide (except where constraints exist) along the Falcon to Gonder transmission line route. (This amendment would be required only for the Buck Mountain route alternative.)

5.2 RMP AMENDMENT PROCESS

Resource Management Plans (RMPs) are policy and planning documents that are developed with public input and adopted by the BLM to guide the agency in managing resources and a variety of uses on public lands. Amendments of these plans are subject to public review and procedures outlined in federal regulations (43 CFR 1610.2-4). Pursuant to these regulations, BLM conducted outreach activities to obtain public input on the project and proposed amendments, developed and circulated planning criteria

[1] As shown in Figure 5-1, only Segments I and J are within currently designated BLM utility corridors.

for use in evaluating the amendments, and incorporated an analysis of the RMP amendments into this EIS. The RMP amendment procedures also call for an extended 90-day public review period of the Draft EIS and RMP Amendments, which is being provided for with review of this document. The regulations also call for a special Governor's Consistence Review of the Final EIS and RMP Amendments document, which will also be provided at a later date.

5.2.1 PLANNING CRITERIA

The following planning criteria were developed by the BLM for evaluation of the proposed RMP amendments. These criteria were published in the Federal Register on September 1, 2000, and circulated to the public for a 30-day review period, per the regulations. The plan amendments should be evaluated against the following criteria:

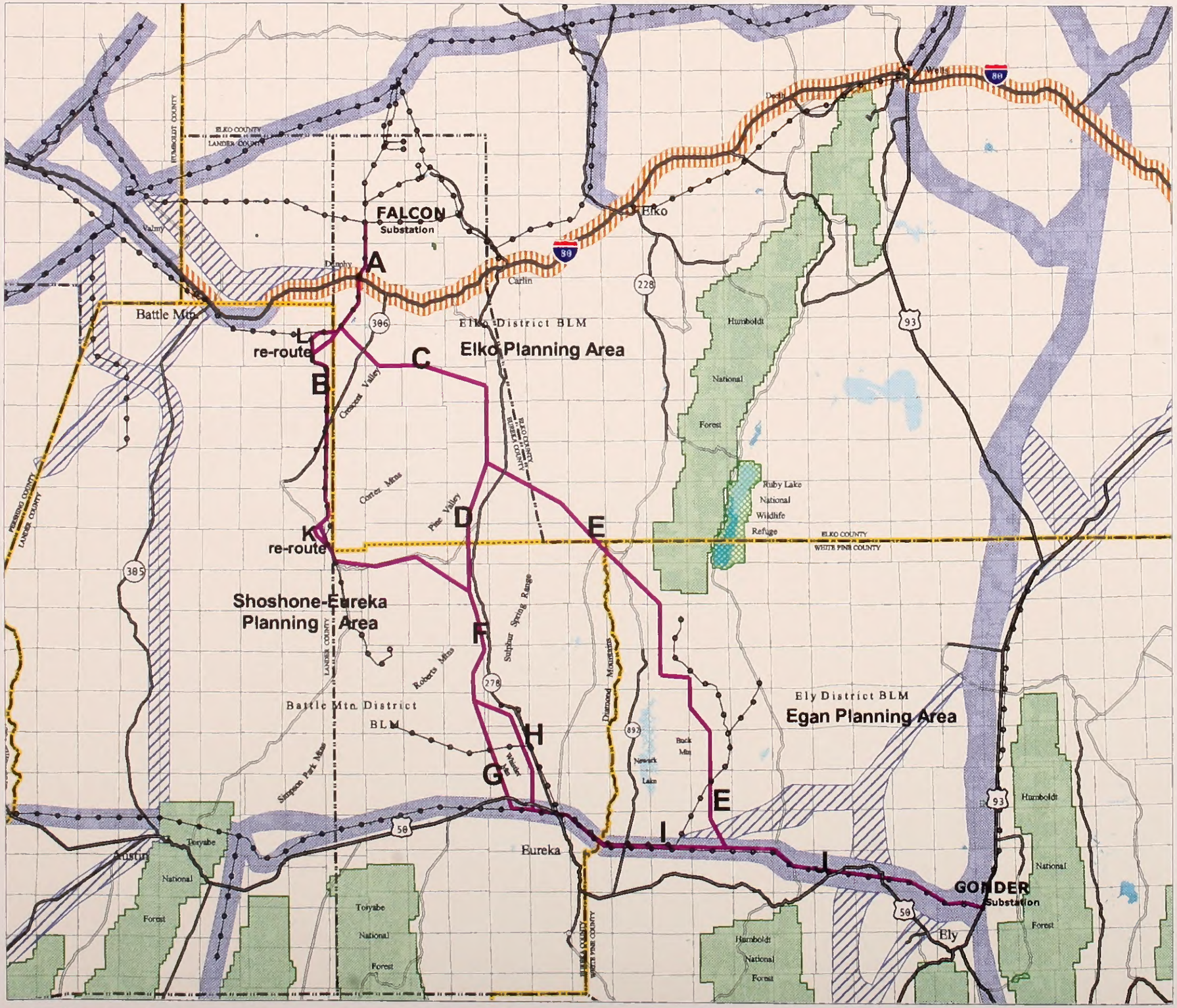
- Emphasize a balanced multiple-use approach to land management, protecting fragile and unique resources, yet not overly restricting the ability of other resources to provide economic goods and services.
- Ensure a system for transmission of utilities through the Resource Management Planning Areas that would allow for future expansion by multiple users.
- Minimize adverse impacts to the environment by concentrating compatible rights-of-way in designated corridors that avoid sensitive resource values.
- Select the preferred alternative based on a combination which best meets demands for public lands while minimizing disruption of the human environment.

5.3 OBJECTIVES FOR DESIGNATING UTILITY CORRIDORS

In general, the BLM designates utility and planning corridors with the objectives of providing space for infrastructure projects, while minimizing the proliferation of dispersed rights-of-way across public lands and the associated environmental impacts. Designation of utility and planning corridors in an RMP indicates the BLM's preferred location for linear rights-of-way (such as those needed for transmission lines, pipelines and other infrastructure projects) in a particular resource area. The utility and planning corridors designated in the Shoshone-Eureka, Elko, and Egan RMPs (BLM 1983, 1986, 1987, respectively) were designated in the 1980s based on the best information available at the time.

These corridor alignments were based largely on input from utilities and government agencies (e.g., the Western Utility Group Regional Corridor Committee) about expected needs for future facilities and their desired locations (BLM 1983). However, some of these projects were never built due to changes in the economy or a variety of other reasons. Other projects were approved outside of designated corridors (e.g., transmission lines for specific mining operations). Thus, while BLM utility corridors reflect the agency's best efforts to predict future needs, they do occasionally need to be re-evaluated and updated.

Designation of a utility corridor does not mean that future rights-of-way are restricted to corridors, nor is it a commitment by the BLM to approve all right-of-way applications within corridors. If the Falcon to Gonder project and RMP amendments are approved, subsequent projects seeking to locate in the utility corridor would be required to undergo additional environmental review pursuant to the National Environmental Policy Act. The average number of transmission lines that are placed together in the same corridor is usually two to four lines (personal communication with John Berdrow, SPPC, July 31, 2000). However, the corridor could contain other linear facilities, such as pipelines, fiber-optic cables, etc.



Sierra Pacific Power Co.

FALCON to GONDER Project

Existing BLM Corridors *

BLM Corridor Types

- Designated Utility Corridor
- Planning Corridor
- Low Visibility Corridor (per Elko RMP)

* From Shoshone-Eureka, Elko, and Egan Resource Management Plans

- BLM District Boundary
- Route Alternatives
- Existing Transmission Line

Scale 1 : 950,400

Kilometers 5 0 5 10 15 20 25 30

Miles 5 0 5 10 15 20

1" = 15 miles

GIS Mapping by EDAW, Inc. – San Francisco 4/25/01

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Sources: BLM Land Tenure Adjustments and Corridors - Recommendations 1986 / EDAW, Inc. 2000 / Stantec 1999

Figure 5 - 1

While the amendments propose designating a new utility corridor up to 3 miles wide, the actual width of the corridor may be narrowed or widened at the BLM's discretion. This may be necessary and appropriate, for example, as a way to avoid disturbing sensitive resources in a particular area. The 3-mile width is considered as a general guideline. This flexibility is desirable as it allows the BLM to locate future rights-of-way and facilities so as to avoid sensitive resources, developments, mines, etc. Each new facility proposed for the corridor would be subject to NEPA environmental review and consideration of potential impacts to such sensitive resources, land uses, etc. The ultimate capacity of the corridor for additional facilities would be determined by BLM through review of future NEPA documents, as well as ongoing land use monitoring and management activities.

5.4 ANALYSIS OF ENVIRONMENTAL IMPACTS AND PLANNING IMPLICATIONS

This section presents an analysis of the environmental impacts and planning implications that would be associated with approval of the Resource Management Plan amendments, as described above. Pursuant to federal regulations, this analysis is limited to the portions of the RMPs being considered for amendment.

5.4.1 GEOLOGY AND MINERAL RESOURCES

SHOSHONE-EUREKA RMP AMENDMENT

The Falcon to Gonder project would not substantially conflict with RMP management objectives for locatable (hard rock) and mineral resources, and leasable geothermal resources, oil and gas, and sodium, potassium or other resources. Coordination with mining companies when locating future rights-of-way can help avoid potential conflicts with large scale mining operations. It is also possible, although expensive, to relocate existing utility lines to accommodate future mining operations.

ELKO RMP AMENDMENT

The implications of the Elko RMP amendment on geology and mineral resources would be largely similar to those associated with the Shoshone-Eureka RMP amendment noted above.

EGAN RMP AMENDMENT

The implications of the Egan RMP amendment on geology and mineral resources would be largely similar to those associated with the Shoshone-Eureka RMP amendment noted above.

5.4.2 SOILS

SHOSHONE-EUREKA RMP AMENDMENT

The Falcon to Gonder project would not conflict with RMP watershed management objectives to reduce and prevent erosion and maintain or improve water quality in the resource area. No conflicts to the RMP are anticipated as long as any future projects in the same corridor comply with the existing watershed management objectives.

ELKO RMP AMENDMENT

The Falcon to Gonder project would not conflict with RMP soil management objectives to maintain or improve rangeland productivity and minimize present and potential erosion due to wind or water. No conflicts to the RMP are anticipated as long as any future projects in the same corridor comply with the existing watershed management objectives.

EGAN RMP AMENDMENT

The Falcon to Gonder project would not conflict with RMP soil management objectives to protect, maintain or improve the quality of the soil resource. No conflicts to the RMP are anticipated as long as any future projects in the same corridor comply with the existing watershed management objectives.

5.4.3 WATER RESOURCES

SHOSHONE-EUREKA RMP AMENDMENT

The Falcon to Gonder project would not conflict with RMP watershed and water resources management objectives to protect the surface waters and ground water supplies and their quality. No conflicts to the RMP are anticipated providing that future projects in the same corridor comply with the existing watershed management objectives and implement mitigation measures to protect the water resources.

ELKO RMP AMENDMENT

The Falcon to Gonder project would not conflict with RMP watershed and water resources management objectives to protect the surface waters and ground water supplies and their quality. No conflicts to the RMP are anticipated providing that future projects in the same corridor comply with the existing watershed management objectives and implement mitigation measures to protect the water resources.

EGAN RMP AMENDMENT

The Falcon to Gonder project would not conflict with RMP watershed and water resources management objectives to protect the surface waters and ground water supplies and their quality. No conflicts to the RMP are anticipated providing that future projects in the same corridor comply with the existing watershed management objectives and implement mitigation measures to protect the water resources.

5.4.4 VEGETATION

SHOSHONE-EUREKA RMP AMENDMENT

RMP management objectives pertaining to vegetation include minimization of vegetation clearing, replacement of vegetation in disturbed areas, protection and improvement of wetland and riparian habitat, and deferment of grazing on vegetation manipulation projects to allow for reestablishment of vegetation. Management objectives related to pinyon-juniper woodlands include sustained-yield production of woodland products including pine nut collection and cut wood products, while protecting sensitive values (e.g., scenic, recreational, watershed, and other values) and historical uses. Standard operating procedures include the following measures regarding vegetation:

- Cutting and removing woodland will be conducted on a sustained basis to allow for continued production except where the objective is to clear a woodland area for increased benefit to other resource values,
- Herbicides to reduce sagebrush and other plant species will be in accordance with BLM procedures to protect non-target species, and
- Vegetation manipulation in riparian areas will not be allowed if it will alter the natural plant composition.

The Falcon to Gonder project would not conflict with RMP vegetation management objectives and standard operating procedures. The RMP amendment would not result in significant impacts to vegetation resources. The RMP objectives for pinyon-juniper woodland allow for flexibility in management, including commercial and non-commercial harvesting and clearing. As a result, the RMP amendment may result in impacts related to pinyon-juniper woodlands. Impacts related to the Falcon to Gonder transmission line project are discussed in Section 3.4, Vegetation. Use of the same corridor for additional utilities may result in additional impacts to pinyon-juniper woodland related to those potential projects. Mitigation measures for losses of pinyon-juniper woodland, if required, would need to be developed in coordination with the BLM, consistent with the provisions of the RMP and other plans pertinent to the woodlands (i.e., the BAER Plan [BLM 1999a]).

ELKO RMP AMENDMENT

The Elko RMP management objectives, including those for woodland areas, are similar to those of the Shoshone-Eureka RMP. The Falcon to Gonder project and RMP amendment would not conflict with the RMP vegetation management objectives and would not result in significant impacts, with the possible exception of impacts to pinyon-juniper woodlands, as discussed under the Shoshone-Eureka RMP amendment analysis.

EGAN RMP AMENDMENT

The Egan RMP management objectives, including those for woodland areas, are similar to those of the Shoshone-Eureka RMP. The Falcon to Gonder project and RMP amendment would not conflict with the RMP vegetation management objectives and would not result in significant impacts, with the possible exception of impacts to pinyon-juniper woodlands, as discussed under the Shoshone-Eureka RMP amendment analysis.

5.4.5 INVASIVE NONNATIVE SPECIES

SHOSHONE-EUREKA RMP AMENDMENT

The Falcon to Gonder project and RMP amendment would not conflict with the RMP management objectives and would not result in significant, unmitigated impacts. Future projects in the corridor could result in noxious weed and cheatgrass-related impacts; however, such impacts would have to be addressed and mitigated under NEPA.

The RMP generally does not discuss noxious weed management directly. Noxious weeds may be indirectly considered through vegetation, range, and wildlife management objectives pertaining to enhancement of degraded range and wildlife habitat or other types of environmental degradation. Standard operating procedures pertaining to herbicidal or other types of treatment of vegetation may also apply to treatment of noxious weeds.

ELKO RMP AMENDMENT

The Falcon to Gonder project and RMP amendment would not conflict with the RMP management objectives and would not result in significant impacts. The analysis is the same as that discussed under the Shoshone-Eureka RMP amendment, above.

EGAN RMP AMENDMENT

The Falcon to Gonder project and RMP amendment would not conflict with the RMP management objectives and would not result in significant impacts. The analysis is the same as that discussed under the Shoshone-Eureka RMP amendment, above.

5.4.6 WILDLIFE AND WILDLIFE HABITAT

SHOSHONE-EUREKA RMP AMENDMENT

One of BLM's objectives for designating utility corridors is to minimize adverse impacts on wildlife and wildlife habitat. The new utility corridor paralleling the Falcon to Gonder transmission line would be shorter and thus impact fewer miles of wildlife habitat than the current Highway 305 planning corridor. Wildlife resources vary from one area to another; however, without accurate baseline data to compare potential impacts from the existing planning corridor to the proposed utility corridor, the comparative impacts are rather conjectural. The Highway 305 corridor crosses through the northern end of the Toiyabe Range, north of the town of Austin. This portion of the corridor is the most critical for wildlife and wildlife habitat given the higher elevation and greater habitat diversity.

When the Highway 305 planning corridor was delineated in the mid-1980s, little environmental data had been collected. Since then, sensitive wildlife resources, including a wetland area, have been identified along that planning corridor. This new information has prompted the BLM to amend the Shoshone-Eureka RMP to delete the Highway 305 planning corridor. (This is discussed further in Chapter 2, Section 2.3.1).

Wildlife and wildlife habitat impacts from the new utility corridor designation along the Falcon to Gonder transmission line would be similar to those discussed under Cumulative Effects (Section 4.6). While some habitat fragmentation would occur from locating utility lines together, the impact may be offset by the benefits of minimizing proliferation of utility lines in other areas. Future rights-of-way applicants would be required to analyze the potential impacts under NEPA. In some areas, the utility corridor width could be adjusted to protect seasonal habitats or other sensitive resources.

ELKO RMP AMENDMENT

Designation of a new utility corridor in the Elko RMP planning area would have similar implications as those stated under the Shoshone-Eureka RMP (see above).

EGAN RMP AMENDMENT

Designation of a new utility corridor in the Egan RMP planning area would have similar impacts to those stated under the Shoshone-Eureka RMP (see above).

5.4.7 SPECIAL-STATUS SPECIES

SHOSHONE-EUREKA RMP AMENDMENT

Overall, impacts to special-status wildlife species as a result of the RMP amendment would be similar to those impacts discussed above for Wildlife and Wildlife Habitats. However, similar impacts can have greater effects on special-status species since their distribution and abundance can be limited and their habitats are often rarer. Sensitive species such as sage grouse, ferruginous hawk and others are known to occur along the Highway 305 planning corridor, as well as in the Falcon to Gonder study area.

In terms of habitat fragmentation of special-status species, it is preferable to locate new utilities in areas that are already disturbed (e.g., with existing utilities, roadways, etc.), as opposed to pristine areas. The Crescent Valley route alternatives have the most existing disturbance in terms of existing transmission lines, mining operations; however, these two route alternatives also have the most impacts to special-status species (see Section 3.20). Buck Mountain is the most undisturbed and relatively pristine of the study corridors. Pine Valley is somewhere in the middle in terms of existing disturbance. However, the Pine Valley (a) route alternative for the Falcon to Gonder transmission line would have the fewest impacts overall to special-status species and sensitive wildlife (as shown in Section 3.20).

ELKO RMP AMENDMENT

Designation of a new utility corridor would have similar impacts to those stated under the Shoshone-Eureka RMP (see above). The location of a utility corridor within Segment E would be inconsistent with Elko RMP's management objective of restricting construction activities that would cross or interfere with crucial sage grouse or raptor wintering or nesting areas; however, mitigation measures are available to reduce this impact to less-than-significant.

EGAN RMP AMENDMENT

Designation of a new utility corridor would have similar impacts to those stated under the Shoshone-Eureka RMP and the Elko RMP (see above). However, the location of a utility corridor within Segment E would likely have a greater impact on seasonal mule deer habitat. It would also likely have a greater impact on pronghorn antelope than the other proposed routes.

5.4.8 RANGE RESOURCES

SHOSHONE-EUREKA RMP AMENDMENT

The RMP indicates that grazing allotment management should be multiple-use in nature, developed in consultation with interested parties and coordinated with other resource activity plans. Management objectives for range resources are to maintain current satisfactory conditions, improve current unsatisfactory conditions, or manage the allotments custodially while protection existing resources. The proposed plan amendment would not significantly affect range resources because a utility corridor will not effectively alter the use of the landscape to exclude cattle, sheep, or horses both wild and domestic. The Falcon to Gonder transmission line, for example, is expected to result in the loss of less than 20 AUMs. Thus, the plan amendment is not expected to significantly affect range resources. No conflicts with the RMP's range resource management goals are anticipated.

ELKO RMP AMENDMENT

The effects of the plan amendment for the Elko RMP on range resource management goals would be similar to those discussed above.

EGAN RMP AMENDMENT

The effects of the plan amendment for the Egan RMP on range resource management goals would be similar to those discussed above.

5.4.9 VISUAL RESOURCES

SHOSHONE-EUREKA RMP AMENDMENT

Designation of the new utility corridor would be inconsistent with some of the visual resource management class objectives currently identified in this RMP (i.e., Roberts Mountains [Class III], Garden Pass [Class III], Devil's Gate and Anchor Peak [Class II]). As with the Falcon to Gonder project, future projects permitted within the new utility corridor would likely traverse the same established Visual Resource Management (VRM) classes where the integrity of the landscape is important. Therefore, it is reasonable to assume that future above-ground projects in the corridor would have the same types of adverse visual impacts as the Falcon to Gonder project.

These could include visual contrasts exceeding the established VRM class objectives. The mitigation measures such as those proposed to eliminate or reduce visual contrast of the Falcon to Gonder project for Segments B, D, F, G, H, and I listed in Section 3.9 could also be required of future projects to reduce or eliminate impacts associated with the RMP amendment.

ELKO RMP AMENDMENT

Designation of the new utility corridor would be inconsistent with some of the visual resource management objectives currently identified in this RMP (i.e., Cortez Mountain [Class III], Cortez Canyon/Cortez Historic District [Class III], and crossing the "low visibility" corridor along I-80). The BLM designated this low visibility corridor along I-80 for the purpose of allowing utility transmission facilities to be located within the corridor if the facility is not evident in the characteristic landscape (BLM 1986). By approving the proposed amendment to the Elko RMP, the BLM would be allowing the utility corridor to be designated across I-80. The visual impact analysis for the Falcon to Gonder transmission line determined that it would have a less-than-significant visual impact across the I-80 (i.e., the low visibility corridor). However, applicants for future projects in the corridor still would be required to analyze visual impacts pursuant to NEPA and to mitigate as appropriate.

As with the Falcon to Gonder project, future projects permitted within the new utility corridor would likely traverse the same established Visual Resource Management (VRM) classes. Therefore, it is reasonable to assume that future above-ground projects in the corridor would have the same types of adverse visual impacts as the Falcon to Gonder project.

These could include visual contrasts exceeding the established VRM class objectives. Mitigation measures proposed to eliminate or reduce visual contrast of the Falcon to Gonder project for Segments A, C, D, and E in Section 3.9 also could be required of future projects to reduce or eliminate impacts associated with the RMP amendment.

EGAN RMP AMENDMENT

Segment E of the Buck Mountain route alternative is the only segment that would fall outside of designated corridors within the Egan RMP resource area. Future projects in the utility corridor would traverse interim VRM classes established by the Egan BLM district and have similar impacts to visual resources as the Falcon to Gonder project (i.e., significant impacts to the Pony Express Trail and where the corridor passes through the Buck Mountains at Buck Pass). Therefore, similar mitigation measures as those proposed for Segment E in Section 3.9 could be required for future projects to reduce or eliminate visual impacts.

5.4.10 PUBLIC HEALTH AND SAFETY

SHOSHONE-EUREKA RMP AMENDMENT

The proposed amendment would not create conflict with the Shoshone-Eureka RMP objectives related to general public health and safety issues. Best management practices and mitigation measures, such as the Fire Prevention and Suppression Plan outlined in Appendix F and Section 3.10, could be applied to future projects within the utility corridor. Thus, the amendment is not anticipated to create significant public health and safety impacts.

ELKO RMP AMENDMENT

The proposed amendment would not create policy conflicts with the Elko RMP related to general public health and safety issues. Best management practices and mitigation measures, such as the Fire Prevention and Suppression Plan outlined in Appendix F and Section 3.10, could be applied to future projects within the utility corridor. Thus, the amendment is not anticipated to create significant public health and safety impacts.

EGAN RMP AMENDMENT

The proposed amendment would not create policy conflicts with the Egan RMP related to general public health and safety issues. Specifically, the Egan RMP directs the development of a fire management plan that "emphasizes fire as a resource management tool and allows for limited suppression in some instances. It would be used to improve habitat and to increase available forage" (BLM 1984:6). Best management practices and mitigation measures, such as the Fire Prevention and Suppression Plan outlined in Appendix F and Section 3.10, could be applied to future projects within the utility corridor. Thus, the amendment is not anticipated to create significant public health and safety impacts.

5.4.11 NOISE

SHOSHONE-EUREKA RMP

The Shoshone-Eureka RMP contains no management objectives related to noise. As a result, the RMP amendment would not conflict with the Shoshone-Eureka RMP. Future projects in the corridor that could result in noise-related impacts would be addressed and mitigated under NEPA.

ELKO RMP

The Elko RMP contains no management objectives related to noise. As a result, the RMP amendment would not conflict with the Shoshone-Eureka RMP. Future projects in the corridor that could result in noise-related impacts would be addressed and mitigated under NEPA.

EGAN RMP

The Egan RMP contains no management objectives related to noise. As a result, the RMP amendment would not conflict with the Shoshone-Eureka RMP. Future projects in the corridor that could result in noise-related impacts would be addressed and mitigated under NEPA.

5.4.12 AIR QUALITY

SHOSHONE-EUREKA RMP

Although air quality goals are not specifically stated in the Shoshone-Eureka RMP, the proposed amendment is not anticipated to result in significant, unmitigated impacts to air quality. Future projects in the corridor that could cause air quality impacts would be subject to NEPA review and air quality impacts mitigated as appropriate.

ELKO RMP

The proposed amendment would not conflict with the Elko RMP management guidance that "air quality will be protected" . . . and prevented from "deterioration beyond the established standards specified in the Nevada Ambient Air Quality Standards" (BLM 1985). The RMP amendment would not result in significant, unmitigated impacts related to air quality. Future projects in the corridor could result in air quality related impacts; however, such impacts would have to be addressed and mitigated under NEPA.

EGAN RMP

The proposed amendment would not conflict with the Egan RMP management guidance to "protect and maintain the high air quality in the area. Recommendations on projects made to protect the air quality are done on a case-by-case basis" (BLM 1984). The RMP amendment would not result in significant, unmitigated impacts to air quality. Future projects in the corridor could result in air quality related impacts; however, such impacts would have to be addressed and mitigated under NEPA.

5.4.13 RECREATION/WILDERNESS

SHOSHONE-EUREKA RMP

Very few developed recreational sites exist within 40 miles of the corridor and additional rights-of-way would have little or no effect on these sites. However, additional rights-of-way projects traversing the National Historic Pony Express Trail along Segment G would create additional adverse visual effects to this recreational resource, potentially reducing its recreational value.

If the new utility corridor is designated as 3 miles wide, portions of the corridor along Segment F may fall within the Roberts Mountain Wilderness Study Area (WSA), having a potentially adverse visual effect on this recreational resource if additional projects are located within the WSA. This impact could be avoided by locating future projects outside of the WSA or by reducing the width of the utility corridor in this area. For these reasons, the proposed Shoshone-Eureka RMP amendment is not expected to cause significant impacts on recreation resources.

ELKO RMP

Similar to the Falcon to Gonder project, the new utility corridor designation near Segments A and C would have no discernable effect to recreational resources in the area due to large distances between established recreation areas and the corridor.

EGAN RMP

If the proposed Egan RMP amendment is adopted, additional rights-of-way traversing the National Historic Emigrant Trail along Segment E could create additional adverse visual effects to this recreational resource. While access to the trail would remain unrestricted, the visual effects could reduce the recreational value of the trail for those recreating the historic Pony Express ride. If designated as 3 miles wide, portions of the corridor along Segment E may also fall within the alignment of the National Historic Emigrant Trail, having a potentially significant visual effect on this recreational resource. Future rights-of-way could be located closer to the Falcon to Gonder transmission line or on the opposite side of the line to avoid these impacts to the Emigrant Trail.

Portions of the utility corridor along Segment E may also fall within the Ruby Mountains Division of Humboldt National Forest, having a potentially significant visual effect on this recreational resource if a future right-of-way were constructed within the forest. However, future rights-of-way would likely be constructed closer to the Falcon to Gonder transmission line, or on the opposite side of the line, to avoid this recreational resource. As a result, an amendment to the Egan RMP would not likely have a significant adverse impact on recreation/wilderness.

5.4.14 LAND USE AND ACCESS

SHOSHONE-EUREKA RMP

Segments B, F, G, and the southern half of Segment D would fall outside of the BLM designated utility corridors in this resource area. As such, the RMP would be amended to include a designated utility corridor along these segments. Additional easements would be required if future rights-of-way are permitted on private lands, potentially precluding or conflicting with existing or proposed land uses. Similar to the Falcon to Gonder project, private property owners would likely be compensated for lands traversed by future transmission/utility line projects during the easement acquisition process.

Given the sparsely developed nature of the project area, the corridor is not expected to substantially alter land use patterns in the region. The Cortez Mine and the town of Crescent Valley could be avoided by future rights-of-way in these areas. Subsequent environmental review would occur for potential future projects, identifying potential conflicts with developed land uses and mining operations. As a result, an amendment to the Shoshone-Eureka RMP would not have a significant adverse impact on developed areas or private property.

The Shoshone-Eureka RMP identifies a number of land tenure adjustments in the vicinity of Segment H. These adjustments identify public lands suitable for disposal north of the town of Eureka and in Township 22 North, Range 52 East, near Segment H. If amended, a designated utility corridor in this location may conflict with the RMP land use policy of public lands disposal. The objective of land tenure adjustments is to increase opportunities for economic development (for recreation, community expansion, agriculture, etc.) by moderately increasing the amount of privately owned land within the resources area consistent with other resource management objectives. Since all land use adjustments are discretionary and must be evaluated through the NEPA process and consistent with the other resource objectives (including the provision of utility corridors in the resource area), an amendment to the

Shoshone-Eureka RMP would not conflict with the other policy objectives concerning land tenure adjustments.

ELKO RMP

Similar to the Falcon to Gonder project, a new corridor along Segments A and C would traverse a number of privately owned parcels. Given the sparsely developed nature of this area, future rights-of-way permitted within the designated utility corridor are expected to have little or no effect on private land uses, nor would they substantially alter land use patterns in the region. The amendment to the Elko RMP is not expected to pose substantial impacts to land use.

EGAN RMP

Although the area along Segment E is sparsely populated and primarily public land, there are large, privately owned farms in Newark Valley that would fall within the new utility corridor if it is designated as 3 miles wide. Future rights-of-way permitted along the Segment E corridor would undergo environmental review, potentially requiring future projects to locate closer to the Falcon to Gonder project in order to avoid these land uses. Similarly, future rights-of-way could be required to avoid mining operations located in this valley. Designation of a utility corridor in this area would not remove substantial amounts of land from grazing activities, as this land use is wide-spread throughout the region. For these reasons, the amendment to the Egan RMP is not anticipated have substantial impacts on land uses, such as privately owned farms, mines, or grazing.

5.4.15 SOCIAL AND ECONOMIC VALUES

SHOSHONE-EUREKA RMP

Since the new utility corridor would be located in a sparsely populated area with few economic activities except for dispersed ranching and mining, the social and economic effects of additional rights-of-way within the corridor would have little or no discernable effect. Rights-of-way and projects could be located strategically to avoid conflicts with such economic activities within the corridor. Similar to the Falcon to Gonder project, the proponent of any right-of-way permitted within the corridor would pay a right-of-way rental fee for public lands crossed by the project and compensate private land owners for easements across their land. The majority of privately owned land in the proposed corridor is in the northern portion along Segment A. Other socioeconomic impacts would be similar to the Falcon to Gonder project (i.e., not significant).

ELKO RMP

Future rights-of-way within this area would have similar social and economic effects as the Falcon to Gonder project and as discussed above for the Shoshone-Eureka RMP (i.e., not significant).

EGAN RMP

Future rights-of-way within this area would have similar social and economic effects as the Falcon to Gonder project and as discussed above for the Shoshone-Eureka RMP (i.e., not significant).

5.4.16 CULTURAL RESOURCES AND PALEONTOLOGY

SHOSHONE-EUREKA RMP

Numerous cultural resources have been identified within 500-foot study corridor for the Falcon to Gonder project. It is reasonable to assume that additional rights-of-way permitted within the utility corridor would have roughly the same types of adverse impacts on cultural resources as the Falcon to Gonder project, as additional cultural resources could exist anywhere within the 3-mile-wide utility corridor.

These could include direct construction-related impacts, as well as indirect impacts such as increased access by construction personnel. Visual intrusions into sensitive cultural sites, including TCPs along Segment B and historic sites such as the Pony Express Trail along Segments G and H, could also be worsened with the addition of future linear projects within the designated utility corridor. Sites that would be avoided by the project could be impacted by future rights-of-way within the corridor, creating a pattern of ongoing disturbance to cultural resources, similar to that described in Chapter 4, Cumulative Impacts. The mitigation measures proposed in Chapter 4 (i.e., Cumulative Cultural Mitigation-1) could be applied to future projects in the utility corridor to eliminate or reduce cultural resource impacts.

Since few cultural surveys have been completed in the Highway 305 area, it is impossible to discern the amount of cultural resources that exist within this area. However, given the amount of cultural resources in the 500-foot study corridor, it is reasonable to assume that numerous cultural resources also exist in the Highway 305 area. Elimination of the Highway 305 planning corridor would help avoid impacts to cultural resources located there. However, the effects to cultural resources would be transferred to the preferred route, with an overall neutral effect.

In summary, the designation of a utility corridor along the preferred route alternative would have potentially significant impacts to cultural resources. Some of these impacts would be offset by the application of Cumulative Cultural Mitigation-1, and the elimination of the Highway 305 corridor. In addition, future projects would undergo subsequent environmental review to determine the extent of their impacts to cultural resources and identify appropriate mitigation measures.

ELKO RMP

Impacts to cultural resources associated with the Elko RMP amendment are expected to be similar to those mentioned above for the Shoshone-Eureka RMP. As many cultural resources were identified in the Segment A and C region, it is reasonable to assume that other cultural resources would exist within a 3-mile-wide corridor in this area. Additional rights-of-way in this corridor could create a pattern of on-going disturbance to cultural resources. As discussed above, application of Cumulative Cultural Mitigation-1 and subsequent environmental review of the impacts to cultural resources of these future projects would reduce the effects of amending the Elko RMP.

EGAN RMP

Impacts to cultural resources associated with the Egan RMP amendment are expected to be similar to those mentioned above for the Shoshone-Eureka RMP. Numerous high-integrity and NRHP-eligible sites have been located within the Segment E corridor. It is reasonable to assume that additional resources would exist throughout this region. Additional rights-of-way in this corridor could create a pattern of on-going disturbance to cultural resources. Direct and indirect impacts to cultural resources would be similar to the project. Specifically, additional rights-of-way near Segment E would allow greater access to an area that is now relatively remote, increasing the potential for unauthorized collection and vandalism of high-integrity sites. As discussed above, application of Cumulative Cultural Mitigation-1

and subsequent environmental review of the impacts to cultural resources of these future projects and identification of appropriate mitigation measures would reduce the effects of amending the Egan RMP.

5.4.17 ENVIRONMENTAL JUSTICE

Similar to the Falcon to Gonder project, the amendments to the Shoshone-Eureka, Elko, and Egan RMPs would have little or no effect to minority or low-income populations, as the utility corridor would be located in sparsely populated areas with few, if any, concentrations of minority or low-income groups. None of the corridor alignments would pass through or close to the eight identified Native American reservations in the area. The nearest reservation is the Ely Reservation, which is located approximately 10 miles from the Gonder substation. The Egan RMP already identifies a designated corridor in this area. Approvals of additional rights-of-way in the corridor could benefit low-income and minority populations though increased spending in the region and temporarily increased levels of employment.

Elimination of the Highway 305 planning corridor would similarly have little or no effect on minority or low income populations as the vicinity of the 305 corridor is sparsely populated. No Native American reservations are located in the Highway 305 corridor.

5.4.18 NATIVE AMERICAN CONCERNS

SHOSHONE-EUREKA RMP

A new utility corridor in the Shoshone-Eureka resource area may potentially impact various ethnobiotic resources, including pinyon pine, sage grouse, eagles, rabbits, and medicinal plants. Native Americans have expressed concerns about the potential effects of transmission lines on these non-heritage resources.

Impacts to Native American concerns resulting from the proposed RMP amendment would be similar to those created by the Falcon to Gonder project, and as such, mitigation measures contained in Section 3.4 (mitigation related to vegetation), Section 3.7 (mitigation related to special-status species), and Section 3.19 (mitigation related to medicinal plants) could also be useful for future projects in the corridor to eliminate or reduce impacts to ethnobiotic resources.

While the extent of ethnobiotic resources within the Highway 305 corridor is unknown, it can be assumed that some or all types may exist here given the similarity of the landscape. Elimination of the Highway 305 corridor would also eliminate potential impacts to Native American concerns regarding ethnobiotic resources in this area.

ELKO RMP

Impacts to Native American concerns resulting from a proposed Elko RMP amendment would be similar to those created by the Falcon to Gonder project. As a result, similar mitigation measures would be useful for future projects in the corridor.

EGAN RMP

Impacts to Native American concerns resulting from a proposed Egan RMP amendment would be similar to those created by the Falcon to Gonder project. As a result, similar mitigation measures would be useful for future projects in the corridor.

5.5 CONCLUSION

Amendments to the Shoshone-Eureka, Elko, and Egan RMPs could facilitate the location of additional rights-of-way and facilities within a new utility corridor, creating roughly the same types of adverse impacts as the Falcon to Gonder project. Mitigation measures similar to the ones identified in this EIS could be required of future projects to reduce or eliminate impacts associated with the RMP amendments. In addition, subsequent environmental review of future rights-of-way projects would identify potential effects to resources.

Elimination of the Highway 305 planning corridor from the Shoshone-Eureka RMP would have a beneficial effect by discouraging the proliferation of utility corridors in that area and encouraging new projects to be constructed in corridors that are consistent across the three BLM districts. The Highway 305 corridor is longer than the Falcon to Gonder corridor and could potentially impact a greater number of sensitive resources than the Falcon to Gonder corridor alignment. Elimination of this corridor is generally seen as a benefit.

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CHAPTER 6

CONSULTATION AND COORDINATION

6.0 CONSULTATION AND COORDINATION

This section identifies the agency staff, consultants and other individuals who assisted in preparation of this Draft EIS and RMP Amendment. It also lists individuals and groups who were contacted for background information, consultation and general input on the document. The list of references cited in the document is provided in Section 6.3. The mailing list of agencies, organizations, and individuals who received copies of this Draft EIS and RMP Amendment is provided in Appendix B.

6.1 LIST OF PREPARERS

This section identifies those individuals who either provided, prepared, or participated in the exchange of information used in this EIS for the Falcon to Gonder project. Individuals are identified by name, contribution to the document, and affiliation.

6.1.1 BUREAU OF LAND MANAGEMENT TEAM

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Paul Myers	• Regional Economist (Social and Economic Values, Environmental Justice)

6.1.2 EDAW TEAM

CONTRIBUTOR	POSITION/RESOURCE/EDUCATION
David Blau (EDAW)	• Principal-in-Charge • Education: M.S. City Planning, Georgia Institute of Technology, 1970; B.S. Landscape Architecture, Pennsylvania State University, 1968.
Steve Nachtman (EDAW)	• Project Manager • Education: M.S. Natural Resource Planning/Economics, Colorado State University, 1983; B.S. Recreation Planning, Colorado State University, Ft. Collins, 1979.

Kim Christensen (EDAW)	• Deputy Project Manager • Education: M.S. Environmental Planning, California State University, Fullerton, 1995; B.A. Art History, University of California, Los Angeles, 1984.
Ron Unger (EDAW)	• Senior Restoration Ecologist and Botanist (Soils, Vegetation Resources, Noxious Weeds, Special Status Species, Public Health and Safety [Fire Plan], Reclamation) • Education: M.S. Ecology, University of California, Davis, 1993; B.A., Psychology, State University of New York, Potsdam, 1978.
Wendy Broadhead (TetraTech EMI)	• Ecologist (Wildlife and Wildlife Habitat, Special-Status Species, Range Resources) • Education: B.S. Plant Science, University of Nevada, Reno, 1992; B.A. Anthropology, University of Nevada, Reno, 1985.
Lorena Solorzano-Vincent (EDAW)	• Wildlife Biologist (Wildlife and Wildlife Habitat, Special-Status Species, Range Resources, Public Health and Safety [Fire Plan]) • Education: B.S. Biology, University of Virginia, Charlottesville, 1994.
Gary Back (Environmental Management Associates)	• Senior Ecologist (Special-Status Species) • Education: Ph.D. Wildlife Ecology, University of Minnesota, 1982; M.S. Forestry, University of Vermont 1976; B.S. Wildlife and Fisheries Management, West Virginia University, 1973.
Brad Brewster (EDAW)	• Environmental Planner (Land Use and Access, Social and Economic Values, Recreation/Wilderness, Cultural Resources and Paleontology, Native American Concerns, Environmental Justice) • Education: M.S. Urban Planning, University of Washington, 1996; B.S. City and Regional Planning, California Polytechnic State University, 1992.
Kurt Legleiter (EDAW)	• Environmental Analyst (Air Quality, Noise) • Education: B.S. Environmental Health Science, California State Fresno, 1994; B.A. Urban and Environmental Planning, California State Fresno, 1994.
Rajinder Sahota (EDAW)	• Environmental Analyst (Air Quality, Noise) • Education: M.S. Atmospheric Sciences, University of California, Davis 2000 (pending); B.S. Atmospheric Sciences, University of California, Davis, 1996.
Kathy Ataman (SEI)	• Archaeologist (Cultural Resources and Paleontology, Native American Concerns) • Education: Ph.D. Archaeology, University of London, M.A. Anthropology, New York University, 1978; B.A. Archaeology, University of Michigan, 1974.
Penny Rucks (SEI)	• Anthropologist (Cultural Resources and Paleontology, Native American Concerns) • Education: M.A. Anthropology, University of Nevada, Reno, 1995; B.A. Anthropology, University of California, Berkeley, 1968.
James Firby (Independent Consultant)	• Paleontologist (Cultural Resources and Paleontology) • Education: Ph.D. Paleontology, University of California, Berkeley, 1969, M.A. Paleontology, California, Berkeley, 1963; B.A. Physical Sciences, San Francisco State College, 1960.
Paul Curfman (EDAW)	• Visual Resource Specialist (Visual Resources) • Education: B.A. Landscape Architecture, University of Oregon, 1979.

John Hitchcock (EDAW)	• Visual Resource Specialist (Visual Resources) • Education: B.A. Urban Planning, Arizona State University, 1990.
Mark Winsor (EDAW)	• Hydrogeologist (Geology and Minerals, Water Resources) • Education: Ph.D. Physical Geography/Geomorphology, University of Wisconsin, 1984; B.A. Geography, Arizona State University, 1968.
Chris Hooper (Enertech)	• Engineer (Public Health and Safety) • Education: B.A. Mathematics, San Jose University, 1987.
Peter Jonas (EDAW)	• GIS Analyst • Education: M.S. Environmental Science (Land Use Planning), State University of New York, 1980; B.A. Biology/Geology, Macalester College, 1974.
Peter Carr (EDAW)	• Technical Editor • Education: B.S. Journalism, Northwestern University, 1987.
Nathan Cistone (EDAW)	• Administrative Assistant • Education: B.S. Visual and Media Arts, Emerson College, 1998.

Legend
EDAW – EDAW, Inc.
SEI – Summit Envirosolutions, Inc.

6.1.3 COOPERATING AGENCIES

NAME	POSITION/RESOURCE/EDUCATION
	Nevada Division of Wildlife
Steve Foree	
Mike Podborny	
Larry Teske	
	State Historic Preservation Office
Alica Baldrica	
Rebecca Palmer	

6.1.4 SIERRA PACIFIC POWER COMPANY

CONTRIBUTOR	POSITION/EDUCATION
John Berdrow	• Project Manager • Education: B.S. Civil Engineering, University of Nevada Reno, 1984, P.E. CA No. 41781, NV No. 9465.
John Bare	• Environmental & Land Manager • Education: B.A., Environmental Biology, University of Colorado, 1990, A.A., Real Estate, Palomar College, 1988.

Shauna Adams	• Senior Environmental Engineer • Education: B.S. Plant, Soil, and Water Sciences, University of Nevada Reno, 1978, M.S. Civil and Environmental Engineering, University of Nevada Reno, 1990
Randall Koshaba	• Project Representative, Construction

6.2 PERSONS, GROUPS, AND AGENCIES CONTACTED

Aguirre, Joseph, Elko County Assessor; Ithurralde, James, Eureka County Assessor; Bishop, Robert, White Pine County Assessor; Duvall, Laura Lander County Assessor, and Almberg, Vivian, Desert Mountain Realty with Brad Brewster, EDAW, Inc. February 29, 2000. (Social and Economic Values)

Back, Gary. Wildlife Consultant at EMA. with Wendy Broadhead, Tetra Tech EMI. July 10, 2000.

Balliette, John. Eureka County Public Lands Department, with Brad Brewster, EDAW, Inc. September 15, 2000.

Bare, John. SPPC. with Brad Brewster, EDAW, Inc. May 3, 2000. (Social and Economic Values), August 10, 2000 (Land Use and Access) August 23, 2000. (Social and Economic Values), and August 14, 2000. (Environmental Justice)

Berdrow, John. SPPC. with Chris Hooper, Enertech, August 16. (Public Health and Safety).

Bradley, Pete. Wildlife Biologist, Nevada Division of Wildlife. Elko, NV. with Lorena Solorzano-Vincent, EDAW, Inc. April 11, 2000. (Wildlife).

Christoferson, John. Nevada Division of Forestry. with Wendy Broadhead, TetraTech EMI. June 22, 2000. (Special Status Species)

Dr. Firby, James. Paleontologist, with Brad Brewster, EDAW, Inc., April 11, 2000 (Cultural and Paleontological Resources).

Elko County Chamber of Commerce. with Brad Brewster, EDAW, Inc. April 13, 2000. (Social and Economic Values)

Ely Chamber of Commerce. with Brad Brewster, EDAW, Inc. April 13, 2000. (Social and Economic Values)

Eureka County Chamber of Commerce. with Brad Brewster, EDAW, Inc., March 24 and April 13, 2000. (Social and Economic Values)

Foreman, Richard. White Pine County Consulting Engineer and Surveyor, with Brad Brewster, EDAW, Inc., June 8, 2000.

French, Barbara. Bat Conservation International, with Wendy Broadhead, TetraTech EMI. July 10, 2000. (Special Status Species).

Grindrod, Paul. Senior Wildlife Biologist with Hawk Watch International with Lorena Solorzano-Vincent, EDAW, Inc. May 8, 2000. (Special Status Species).

Hirschman, Douglas, Independent Mineral Landman, with Brad Brewster, EDAW, Inc. with July 16, 2000.

Nevada Division of Wildlife, Steve Foree, Mike Podborny, and Larry Teske.

Kashaba, Randy. SPPC, with Brad Brewster, EDAW, Inc. August 15, 2000. (Environmental Justice)

Perkins, Michael. Wildlife Biologist, BLM Ely Field Office, with Lorena Solorzano-Vincent EDAW, Inc. May 15, 2000 and July 24, 2000. (Wildlife and Special Status Species).

Podborny, Mike. Wildlife Biologist, Nevada Division of Wildlife. Eureka, NV. with Wendy Broadhead. TetraTech EMI and Lorena Solorzano-Vincent EDAW, Inc. August 9, 1999 and July 24, 2000. (Wildlife).

Rucks, Penny. Anthropologist, SEI, with Brad Brewster, EDAW, Inc., September 22, 2000. (Native American Concerns).

Sherwin, Rick. Department of Biology, University of New Mexico, Albuquerque, NM. with Wendy Broadhead. July 10, 2000. (Special Status Species)

Stamm, Michael. Wildlife Biologist, Battle Mountain BLM Field Office, NV. with Lorena Solorzano-Vincent EDAW, Inc. July 31, 2000. (Special Status Species).

State Historic Preservation Office, Alice Baldrica (State Historic Preservation Officer), and Rebecca Palmer.

Tribble, Jack. BLM Ely Field Office Recreation Specialist with Brad Brewster, EDAW, Inc. November 2 and 6, 2000.

Wilkinson, K. Wildlife Biologist. BLM Elko Field Office. with Wendy Broadhead. TetraTech EMI. July 19, 2000 (Wildlife).

Wilson, Bob. Weeds Specialist, White Pine County Agricultural Extension Service. Ely, Nevada. with Wendy Broadhead. TetraTech EMI. May 2000. (Invasive Nonnative Species).

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CHAPTER 7

GLOSSARY AND LIST OF ACRONYMS

7.0 GLOSSARY AND LIST OF ACRONYMS

7.1 GLOSSARY

Ambient Air
Any unconfined portion of the atmosphere; the outside air.

Aluminum Conductor Steel Reinforced
This type of conductor has aluminum strands wrapped around a stranded steel core. The steel "reinforces" the conductor because it is much stronger

Ambient Air Quality Standard
A federal and state measure of the level of air contamination that is not to be exceeded in order to protect human health.

Assessor Parcel Number
Given to a parcel, or a specified area, of land by the County tax assessor.

Capacity
The power ability of electrical equipment measured in watts.

Control Area
A portion of the interconnected electricity system grid whose operations and procedures are controlled and managed by a single utility. This utility typically owns most of the facilities in its control area and is responsible for the physical interaction with neighboring control areas.

Demand Side Management
Influencing the level of demand for electricity, e.g., through conservation programs and education related to home insulation, energy efficient appliances, etc.

Electric Resource Plan
A plan required by the Public Utility Commission of Nevada every three years to determine how future energy requirements will be served.

Export Capability
The capacity or extent to which a utility or electric control area can sell electric power outside its electric system at a given time or during a given set of conditions using all available facilities.

Exports
The sale of electricity by a utility to another utility outside its electric system.

Firm Purchases
Contractual procurement of electric energy that is intended to have assured availability to the customer.

Generation
The production of electricity from other forms of energy such as combustion, falling water, or thermal transfer.

Generation Capacity
Maximum electric production limit for which a generator is rated. The maximum limit fluctuates with changes in temperature or other environmental circumstances, depending on the type of machine.

Gigawatt-hours
A measure of electric energy. One million kilowatt-hours.

Harney
Harney Electric Cooperative, Inc. Oregon State Public Utility.

Hydro-axe
A hydro-axe is a large lawnmower-like machine that cuts brush and vegetation down to about 6 inches above the ground, leaving the root systems intact for regrowth. This machine would be used where needed to provide construction equipment and vehicle access to the tower sites.

Import Capability
The capacity or extent to which a utility or electric control area can purchase electric power from outside its electric system at a given time or during a given set of conditions using all available facilities.

Imports
The purchase of electricity by a utility from another utility outside its electric system.

kcmil
Cable cross section area of in thousands of circular mils

Kilovolt
A measure of electric voltage, one thousand volts. Household current is supplied at 120 volts.

Load Centers
Major areas of electricity consumption such as large cities or large industrial facilities.

Megawatt
A measure of alternating current electric power that performs work. One thousand kilowatts or one million watts. A standard light bulb is 60 to 100 watts.

Mt. Wheeler
Mt. Wheeler Power

Mvar
Megavar. A unit of alternating current electric power that performs no useful work, as opposed to a megawatt. It can be used to describe whether a system is either deficit or has excess reactive capability to support its voltage.

Native Generation
Electricity generation within a utility service area.

Native Load
Traditional customers served within a utility service area.

Nitrogen Oxides
A gaseous mixture of nitric oxide (NO) and nitrogen oxide (NO_2) and symbolically represented as NO_3.

Nitric Oxide
A molecule of one nitrogen and one oxygen atom. Results usually from combustion of organic substances containing nitrogen and from recombination of nitrogen decomposed in air during high temperature combustion; poisonous and highly reactive gasses produced when fuel is burned at high temperatures, causing nitrogen in the air to combine with oxygen.

Nitrogen Dioxide
A molecule of one nitrogen and two oxygen atoms. Results usually from further oxidation of nitric oxide (NO) in the atmosphere. Ozone accelerates to conversion.

Non-firm Purchases
Electric energy purchases having limited or no assured availability.

Non-utility Owned Generation
Generation that is possessed by an entity not in the business for the sale of electricity to retail customers.

Operating (or Spinning) Reserves
As required by WSCC Operating Criteria, WSCC member utilities must have standby generation, actually on-line, but not delivering power, to insure an adequate level of service.

Ozone
A colorless gas formed by a complex series of chemical and photochemical reaction of reactive organic gasses, principally hydrocarbons, with the oxides of nitrogen, which is harmful to the public health, the biota, and some materials; a molecule of three oxygen atoms – O_3. A principle component of "oxident' in photochemically polluted atmospheres.

PacifiCorp
Utility resulting from the merger of Pacific Power and Light and Utah Power and Light.

Particulate Matter (particles)
Very fine sized solid matter or droplets, typically averaging one micron or smaller in diameter. Also called "aerosol."

Parts Per Billion
A measure of the amount of one substance in a second, which is the carrier.

Parts Per Million
A measure of the amount of one substance found in a carrier.

Photochemical Pollutant
Reactive organic compounds (ROC) and nitrogen oxides (NO_x), photochemical pollutants that absorb energy from the sun and react chemically to form ozone (O_3).

Planning Reserves
As required by WSCC Operating Criteria, WSCC member utilities must have standby generation capacity, in addition to existing demand requirements, to insure an adequate level of service.

PM_{10}
Particulate matter less than 10 micron in size, which is small enough to be inhaled deeply into the lungs and cause disease.

Pool Agreements
Agreements among utility alliance members (e.g., NPP) for the sharing of resources or satisfaction of operation and reliability criteria.

Power
The time rate of transferring energy (expressed in watts).

Rating
Maximum operation limit of transmission or generation facilities, as established by WSCC and/or NPP operating and reliability criteria guidelines. Utility facilities and interconnections can be rated either for individual or simultaneous operation, where simultaneous operations take into consideration collective WSCC or NPP utilities.

Reactive Power
A component of power production that is not sold.

Reserve Requirement
The amount of excess energy that should be immediately available to maintain reliability of the interconnected system during the unplanned loss of a source.

Right-of-Way
An easement, lease, permit, or license across an area or strip of land to allow access or to allow utility to pass through public or private lands.

Riparian
Area along the banks of a river or lake supporting specialized plant and animal species.

Self-owned or Utility-Owned Generation
Electric generation that is possessed by a utility.

Sensitive Receptor

Land uses adjacent to or within proximity to the Proposed Project that could be impacted by the construction, operation, and maintenance activities.

Series Compensation
An AC device typically used to reduce or increase the voltage drop across a utility's transmission lines by changing the reactive impedance of the line. Typical applications are series capacitors to reduce impedance and series reactors to increase impedance.

Shunt Compensation
An AC device that either supports or suppresses a utility's voltage by injecting or drawing reactive power, i.e., megavars, from the system. Typical applications are bus capacitors and line reactors.

Static VAR Compensators
An AC device typically used to modulate a utility's voltage dynamically by switching shunt compensation elements using thyristors. Modulation of voltage can result in increased damping of voltages and power swings.

Sulfur Oxides
The group of compounds formed during combustion or thereafter in the atmosphere of

sulfur compounds in the fuel, each having various levels of oxidation, ranging from two oxygen atoms for each sulfur to four oxygen atoms.

System Security
The ability of the bulk power electric system to withstand sudden disturbances such as an electric short circuit of unanticipated loss of system components.

Tap
A short electrical transmission line connecting a power plant to a main transmission line, with no switching facilities at the point of connection.

Total Suspended Particulates
Solid or liquid particles small enough to remain suspended ion air. PM_{10} is the portion of TSP that can be inhaled.

Transmission Service Customers
Wholesale electricity utilities or other entities that pay for the use of another utility's facilities to transmit electric power from one point to another.

Utility Corridor
A linear corridor usually designated for facilities such as powerlines, pipelines, fiber-optic cables, roads etc.

Wetland
Lands traditional between obviously upland and aquatic environments. Wetlands are generally highly productive environments with abundant fish, wildlife, esthetic, and natural resource values. For this reason, coupled with the alarming rate of their destruction, they are considered valuable resources, and several regulations and laws have been implemented to protect them.

Wheeling
An electric operation wherein transmission facilities of one system are utilized to transmit power of another system. Power can be wheeled in, through, or out of a system

7.2 LIST OF ACRONYMS

4WD	4-wheel drive
AAQS	Ambient Air Quality Standard
AC	Alternating current
ACHP	Advisory Council on Historic Preservation
ACIP	Airport Capital Improvement Project
ACS	American Cancer Society
ACSR	Aluminum Conductor Steel Reinforced
AIRFA	American Indian Religious Freedom Act
AM	Amplitude Modulation
AMA	American Medical Association
APE	Area of potential effect
APLIC	Avian Powerline Interaction Committee
APN	Assessor Parcel Number
ARPA	American Resources Protection Act
ATC	Available Transmission Capacity
ATV	All-Terrain Vehicle
AUM	Animal Unit Month
b.p.	Before present
BAER	Burned Area Emergency Rehabilitation
BAQ	Bureau of Air Quality
BCI	Bat Conservation International
BIA	Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management
BMP	Best Management Practice
BPA	Bonneville Power Administration

CAAA	**Clean Air Act Amendments**
CCC	**Civilian Conservation Corps**
CEQ	**Council on Environmental Quality**
CFR	**U.S. Code of Federal Regulation**
Cfs	**Cubic feet per second**
CISA	**Cumulative impacts study area**
COM	**Construction, Operation, and Monitoring**
CPRR	**Central Pacific Railroad**
CRT	**Cathode ray tube**
CSA	**Council for Scientific Affairs**
CWA	**Civil Works Administration**
dB	**Decibel**
DC	**Direct current**
DOE	**Department of Energy**
DOI	**Department of the Interior**
DSM	**Demand Side Management**
E&P	**Eureka and Palisade**
EHF	**Extremely High Frequency**
EIS	**Environmental Impact Statement**
ELF	**Extremely low frequency**
ELF-EMF	**Extremely Low Frequency Electric and Magnetic Fields**
EMF	**Electric and Magnetic Fields**
EPA	**U.S. Environmental Protection Agency**
EPRI	**Electric Power Research Institute**
ERP	**Electric Resource Plan**
ESH	**Environmentally Sensitive Habitat**

ESI	Ecological Status Inventory
FAA	Federal Aviation Administration
fbg	feet below grade
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRE	Finance, Insurance, and Real Estate
FLPMA	Federal Land Policy and Management Act
FTE	Full-time equivalent
G	Gauss
GIS	Geographic Information Systems
GLO	General Land Office
GPS	Global positioning system
gWh	gigawatt-hours
HF	High frequency
HF	High Frequency
HMA	Herd Management Area
HMMSPP	Hazardous Materials Management and Spill Prevention Plan
HPTP	Historic Properties Treatment Plan
Hz	Hertz
ID	Interdisciplinary
IEEE	Institute of Electric and Electrical Engineers
IITRI	Illinois Institue of Technology Research
ILS	Instrument Landing System
IMACS	Intermountain Archaeological Computer System
IMP	Interim Management Policy

IPC	**Idaho Power Company**
IPP	**Intermountain Power Project**
ISA	**Instant Study Area**
ITU	**International Telecommunication Union**
KOP	**Key Observation Point**
kV	**Kilovolt**
kWh	**Kilowatt hour**
LADWP	**Los Angeles Department of Water and Power**
LCD	**Liquid crystal display**
Ldn	**Day-night noise level**
Leq	**Equivalent noise level**
LF	**Low Frequency**
mA	**Milliamperes**
MBTA	**Migratory Bird Treaty Act**
MF	**Medium Frequency**
MFP	**Management Framework Plan**
mG	**Milligauss**
MLRA	**Major Land Resource Area**
MP	**Milepost**
MPE	**Maximum Probable Earthquake**
Mvar	**Megavar**
MW	**Megawatt**
MWP	**Mt. Wheeler Power**
NAAQS	**National Ambient Air Quality Standards**
NAGPRA	**Native American Graves Protection and Repatriation Act**
NB	**Nevada Bell**

NBMG	Nevada Bureau of Mines and Geology
NDEP	Nevada Division of Environmental Protection
NDOA	Nevada Department of Agriculture
NDOT	Nevada Department of Transportation
NDOW	Nevada Division of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NERC	National Electric Reliability Council
NESC	National Electrical Safety Code
NESC	National Electric Safety Code
Nevada AAQS	Nevada Ambient Air Quality Standards
NHPA	National Historical Preservation Act
NIEC	Nevada Indian Environmental Coalition
NIEHS	National Institute of Environmental Health Sciences
NNHP	Nevada Natural Heritage Program
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPA	National Programmatic Agreement
NPDES	National Pollutant Discharge Elimination System
NPP	Northwest Power Pool
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statutes
NSP	Nevada State Parks

NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
O_3	Ozone
ORAU	Oak Ridge Associated Universities
ORV	Off-road vehicle
P.L.	Public Law
PG&E	Pacific Gas and Electric Company
ppb	parts per billion
ppm	parts per million
ppv	Peak particle velocity
Psi	Pounds per square inch
PUC	Public Utilities Commission
PUCN	Public Utility Commission of Nevada
RAPID	Research and Public Information Dissemination
RCRA	Resource Conservation and Recovery Act
RMP	Resource Management Plan
ROC	Reactive Organic Compound
ROD	Record of Decision
ROG	Reactive Organic Gasses
ROW	Right-of-Way
RV	Recreation vehicle
SCE	Southern California Edison Company
SCECP	Soil Conservation and Erosion Control Plan
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCP	Stream Crossing Plan
SEI	Summit Envirosolutions, Inc.

SHF	**Super High Frequency**
SHPO	**State Historic Preservation Officer**
SIP	**State Implementation Plan**
SNR	**Signal to noise**
SO_2	**Sulfur Dioxide**
SOP	**Standard operating procedure**
SO_x	**Sulfur Oxides**
SPPC	**Sierra Pacific Power Company**
SR	**State Route**
SRMA	**Special Recreation Management Area**
SSURGO	**Soils Survey Geographic**
SUP	**Special Use Permit**
SVC	**Static VAR Compensators**
SWIP	**Southwest Intertie Project**
SWPPP	**Stormwater Pollution Prevention Plan**
TCID	**Truckee Carson Irrigation District**
TCP	**Traditional Cultural Property**
TCPU	**Transportation, Communication, and Public Utilities**
TDPUD	**Truckee Donner Public Utility District**
TDS	**Total dissolved solids**
TL	**transmission line**
TOT	**Traditional Occupancy Tax**
TSP	**Total Suspended Particulate**
UBC	**Uniform Building Code**
UEPA	**Utility Environmental Protection Act**
UHF	**Ultra High Frequency**

USACE	**U.S. Army Corps of Engineers**
USBM	**U.S. Bureau of Mines**
USDA	**U.S. Department of Agriculture**
USDI	**United States Department of the Interior**
USFWS	**U.S. Fish and Wildlife Service**
USGS	**U.S. Geological Survey**
V/m	**Volts per meter**
VHF	**Very High Frequency**
VLF	**Very Low Frequency**
VOC	**Volatile Organic Compound**
VRM	**Visual Resource Management**
W/MBE	**Woman and/or minority business enterprise**
WC	**Williams Communication**
Wells	**Wells Rural Electric Company**
WSA	**Wilderness Study Area**
WSCC	**Western Systems Coordinating Council**

CHAPTER 8

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Right-of-way (ROW)..... **ES:** 1, 7-8, 12-14; **1:** 1, 18; **2:** 1-3, 5, 16-20, 24, 26, 30, 33; **3.1:** 1, 21, 26-28; **3.3:** 3, 14; **3.4:** 16, 18; **3.5:** 11, 16; **3.6:** 14, 19; **3.9:** 7; **3.10:** 10, 13, 15, 19-23, 25, 27-31; **3.11:** 3, 123, 15, 17-20, 22-24, 29-31; **3.12:** 1, 6-8; **3.13:** 2, 5-7, 11-16, 18-22; **3.14:** 11; **3.15:** 2, 11; **3.17:** 2; **3.18:** 1; **3.20:** 2, 3, 11, 13; **4:** 3, 3-8, 13; **5:** 1-2, 13-14; **6:** 15, 18; **7:** 3, 10

Riparian..... **ES:** 5-6; **3.0:** 2; **3.2:** 8; **3.4:** 3-5, 7, 9-10, 13-14, 17-22; **3.5:** 5; **3.6:** 2-4, 8, 9-12, 16, 20; **3.7:** 9, 12, 14, 19; **3.13:** 7; **3.14:** 7; **3.19:** 3; **3.20:** 2; **5:** 6-7; **7:** 3

Sage Grouse..... **ES:** 7, 10-11; **2:** 27, 30, 31; **3.1:** 2; **3.4:** 4; **3.6:** 2, 7, 9; **3.7:** 2, 9, 11-13, 15, 25-29, 32-39; **3.19:** 5, 7-8; **3.20:** 4-5; **4:** 14-15, 21; **5:** 9, 16; 6: 7, 10-13, 15, 17, 21, 24, 26

Special-Status Species..... **ES:** 5, 7; **2:** 23; **3.0:** 1-2; **3.4:** 2, 18; **3.6:** 1, 4, 9, 15; **3.7:** 1-3, 21-25, 29-40; **3.19:** 8; **3.20:** 1, 4-5, 12; **4:** 14; **5:** 9, 16; **6:** 3

Southwest Intertie Project (SWIP) Corridor..... **2:** 30, 34, 36; **4:** 4, 7-8; **7:** 11

Threatened and Endangered Species..... **3.4:** 9; **6:** 18

Traditional Cultural Properties (TCPs)..... **ES:** 10; 3.16: 1, 5-7, 14, 16, 19-20, 24-25, 30-33, 35; **3.18:** 6; **3.19:** 1-2, 8, 11; **3.20:** 14; **4:** 2, 17; **5:** 15; **6:** 19; **7:** 11

Utility Corridor..... **ES:** 1, 13-16; **1:** 1, 18; **2:** 26, 30; **3.7:** 28; **3.9:** 11-12; **3.13:** 5-7, 9-10, 17-18; **3.19:** 11; **3.20:** 11; **4:** 1-2, 4, 7-17, 19-20, 22; **5:** 1-2, 5, 8-17; **7:** 4

Water Resources ..... **ES:** 5-6; **3.0:** 1; **3.1:** 4; **3.3:** 1, 3, 9, 10, 20, 26; **3.4:** 9, 19; **3.6:** 16, 20; **3.20:** 2, 12; **4:** 2, 11-12; **5:** 6; **6:** 4, 13; **7:** 9

Western Shoshone ..... **ES:** 9, 10; **3.16:** 2, 5, 7, 10, 13-16, 19-20, 24-25, 30; **3.18:** 3-6; **3.19:** 1-5, 7-8, 11-12; **3.20:** 3-4, 6-7; **6:** 12, 16, 22, 24

Wetlands ..... **ES:** 5-6; **2:** 23, 30, 31; **3.0:** 1-2; **3.3:** 1-2, 6, 9-10, 12-13, 18-19; **3.4:** 1-4, 6-7, 9-10, 13, 17-19; **3.6:** 15; **3.10:** 14; **3.13:** 7; **3.14:** 6; **3.19:** 5-6; **3.20:** 2; **5:** 1; **7:** 4, 10

Wild Horses ..... **ES:** 5, 7; **3.0:** 1; **3.8:** 1-2, 6, 9-10; **3.13:** 9; **3.14:** 9; **3.20:** 2, 12; **4:** 2

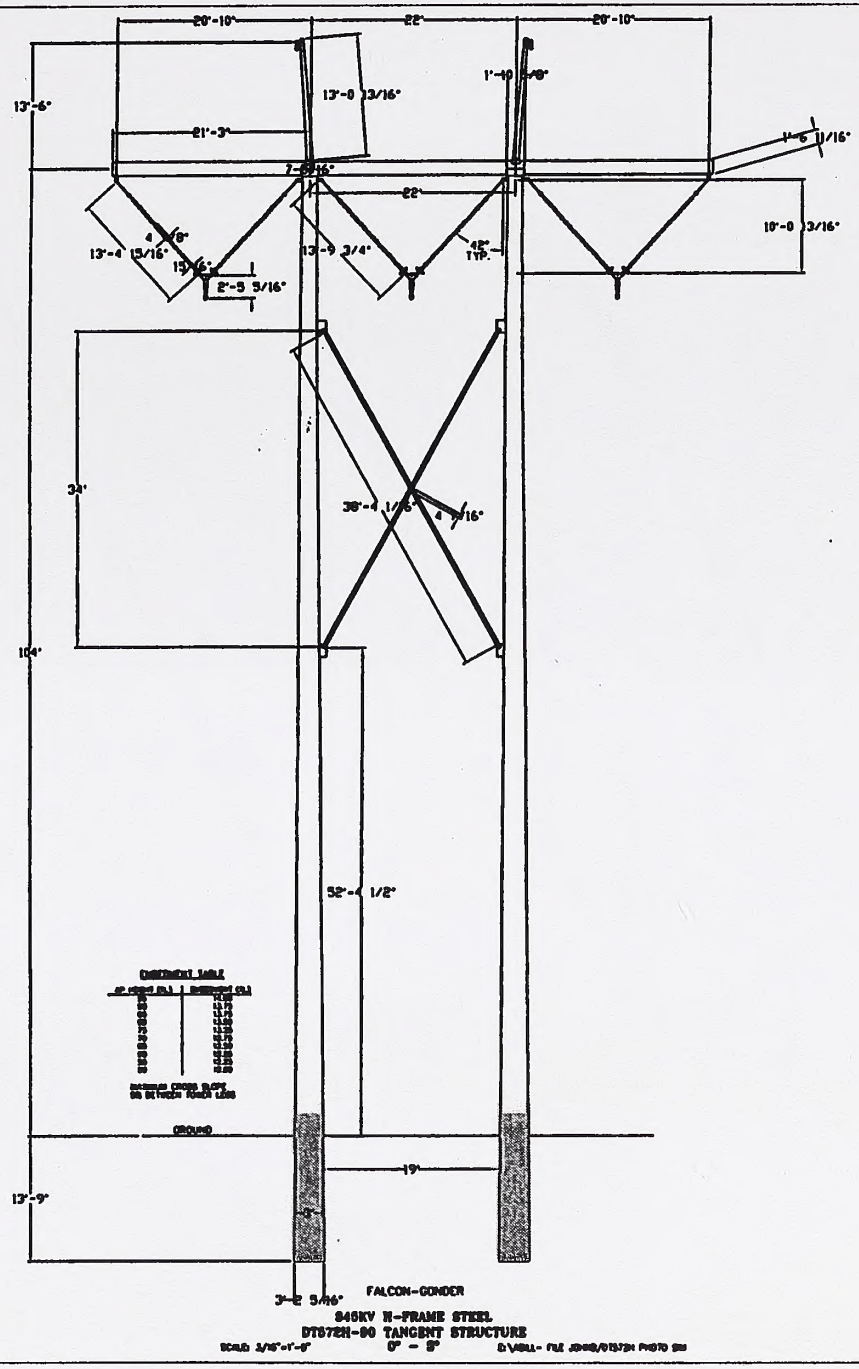
Wilderness ..... **ES:** 5-6, 8; **2:** 27; **3.0:** 1-2; **3.1:** 2; **3.9:** 3 **3.12:** 7; **3.13:** 7; **3.14:** 1-2, 5-6, 9-12, 14, 18-19; **3.20:** 3, 13; **4:** 2, 19-21; **5:** 12-13; **6:** 1-3, 9; **7:** 12

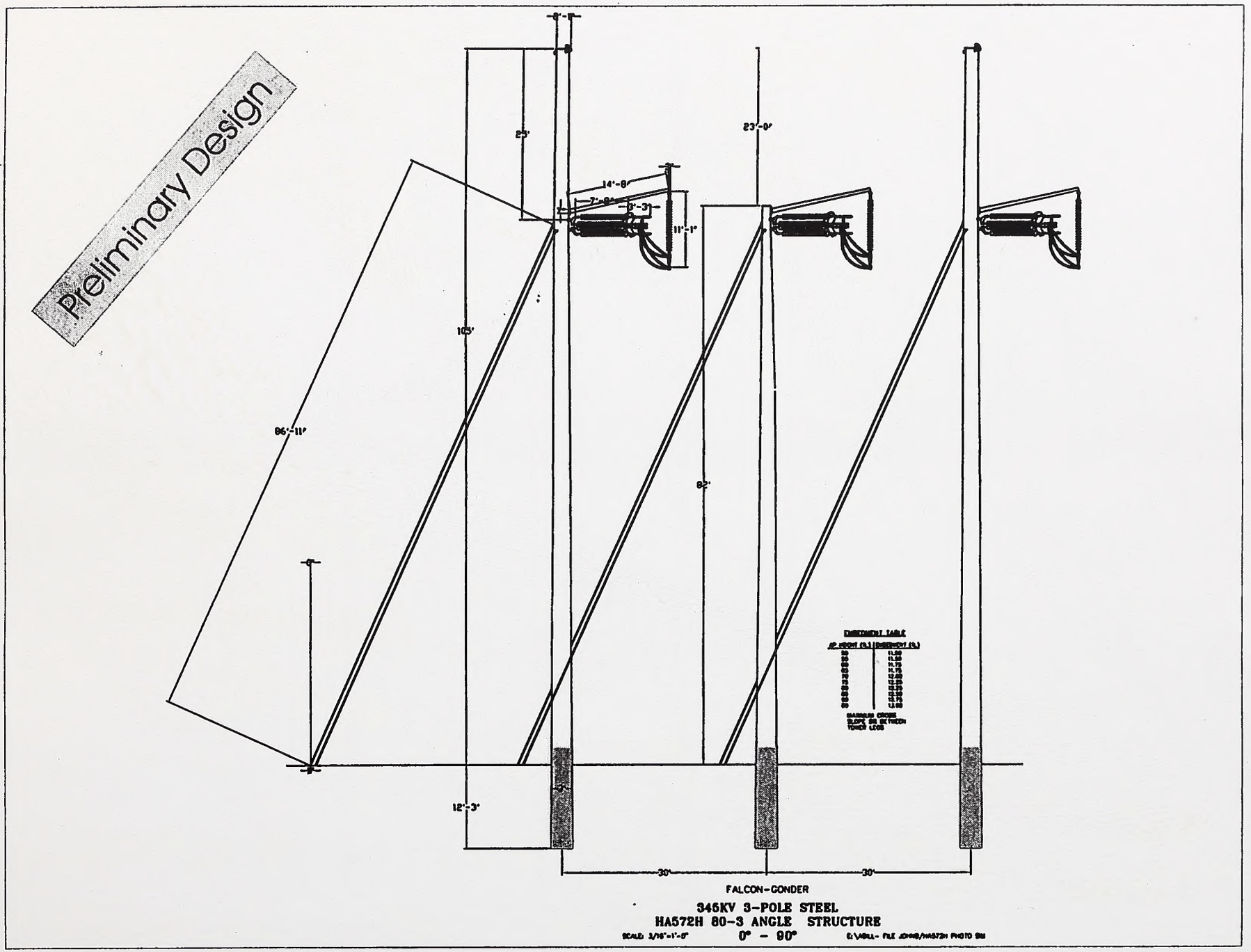
Yucca Mountain **2:** 30-31; **4:** 7, 9

APPENDIX A

TYPICAL POLE STRUCTURE COMPONENTS

Preliminary Design





FALCON-GONDER

345KV 3-POLE STEEL

HA572H 80-3 ANGLE STRUCTURE

SCALE 3/16"=1'-0" 0° - 90° G:\MBLL- FILE JOHNS/HA572H PHOTO SIM

APPENDIX B

AGENCIES, ORGANIZATIONS, AND INDIVIDUALS WHO RECEIVED THE DRAFT EIS AND RMP AMENDMENTS

Federal Agencies

Federal Highway Administration
US Air Force, Office of Deputy A/S, Washington, DC
US Army Corps of Engineers, Regulatory Section, Sacramento, CA
US Army Corps of Engineers, Reno, NV
US Bureau of Land Management, Battle Mountain Field Office
US Bureau of Land Management, Caliente Field Station
US Bureau of Land Management, Carson City Field Office
US Bureau of Land Management, Elko Field Office
US Bureau of Land Management, Ely Field Office
US Bureau of Land Management, Las Vegas Field Office
US Bureau of Land Management, Nevada State Office
US Bureau of Land Management, Tonopah Field Station
US Bureau of Land Management, Winnemucca Field Office
US Bureau of Reclamation, Denver, CO
US Department of Energy, Yucca Mountain Project, Las Vegas, NV
US Department of Energy, Office of Environmental Compliance, Washington, DC
US Environmental Protection Agency, Region IX
US Fish and Wildlife Service, Reno, NV
US Fish and Wildlife Service, Ruby Lake National Wildlife Refuge
US Fish and Wildlife Service, Washington, DC
US Forest Service, Humboldt National Forest, Wells, NV
US Forest Service, Humboldt-Toiyabe National Forest, Elko, NV
US Forest Service, Tonopah Ranger District
US Geological Survey, Reston, VA
US National Park Service, Washington, DC
US National Park Service, Long Distance Trails Office, Salt Lake City, UT
US Senate

State Agencies

Commission for the Preservation of Wild Horses
Nevada Department of Conservation and Natural Resources, Division of Water Resources
Nevada Department of Conservation and Natural Resources, Natural Heritage Program
Nevada Department of Transportation
Nevada Division of Environmental Protection
Nevada Division of Wildlife, Battle Mountain Field Office
Nevada Division of Wildlife, Elko Field Office
Nevada Division of Wildlife, Eureka Field Office
Nevada Division of Wildlife, Reno, NV
Nevada Governor, Kenneth Guinn
Nevada State Assembly, Honorable Marcia Debraga
Nevada State Clearinghouse
Nevada State Historic Preservation Office
Nevada State Senate, Honorable Mike McGinness
Nevada State Senate, Senator Dean Rhoads
State of Nevada, Division of State Lands

County/Local Agencies

Board of County Commissioners, Elko County
Board of County Commissioners, Esmeralda County
Board of County Commissioners, Eureka County
Board of County Commissioners, Lander County
Board of County Commissioners, Nye County
Board of County Commissioners, White Pine County
City of Carlin
City of Ely
Eureka County District Attorney
Eureka County Natural Resources Department

County/Local Agencies (cont.)

Eureka County Public Land Use Advisory Commission
Eureka County Public Works Director
Municipal Water Department, Ely, NV
Town of Crescent Valley
White Pine County Public Lands Commission

Tribal Organizations

Duckwater Shoshone Tribe
Ely Shoshone Tribe
Fallon Paiute Tribe
Fort McDermitt Tribal Council
Ft. Hall Shoshone-Bannock
Lovelock Paiute Colony Council
Nevada Indian Environmental Coalition
Shoshone-Paiute Tribes of Duck Valley
Summit Lake Tribal Council
Te-Moak Tribe of Western Shoshone, Battle Mountain Band
Te-Moak Tribe of Western Shoshone, Elko Band
Te-Moak Tribe of Western Shoshone, South Fork Band
Te-Moak Tribe of Western Shoshone, Wells Band
Western Shoshone Defense Project
Winnemucca Tribal Council
Yomba Shoshone Tribe

Individuals/Other Interested Parties

A.L Frederick
Albert Waelbrock
Alfred and Carol Darancette
Alvin Naar
Anerico Bucci
Ann O'Connell
Anna Fofi
Annie Dermengian Rev. Trust
Arnold and Earlene Lenschmidt
Arthur and Linda Meecham
Arthur and Linda Meecham
Augusto and Melinda David
Beowawe Power, LLC
Betty Miller
Bob Edwards
Bobbi Royle
Brian and Susan McGuire
Cardell Lundahl
Carl Slagowski
Catherine Clark
Cathleen Holley
Cecil and Delores Abbot
Charles Armuth, Jr.
Charles Lamos
Cherie Eversole
Clausser Family Trust
Cooper and Sons, Inc.
D N Hansen
Dale Ryan
Delores Veljko
Dolores Kelso Gezzer
Don and Better Oertel
Doris Sedlak
Dorothy Ahern
Dorothy Spinos
Ed and Kay Helley
Eddie Collins
Edward Givant
Elizabeth Booth
Enrique and Amalia Alvarez
Ernest Green
Eugene Matan and Nancy Lambert
Eva and Francis Tonque
Eva Terr
Evelyn Ruth Wilson
Florine Maine
Gary and Melody Garaventa
George and Catherine Mansfield
George and Ruth Sylvester
Gerrit Book
Gertrude Knudsen
Glenn Watson
Gloria Schuh
Gloria Schuh
Gregory and Michael Hovis
Haas Trust
Hale Bailey
Harold and Kathleen Standley
Haruta Ckihara
Haruto and Alice Okihara
Helen Strickler
Howard and Joan Branss
Howard and Nancy Elbertson
Ida Manone
James Burton
Jerry Cross

Individuals/Other Interested Parties (cont.)

Jerry Cross
Jim and Helen Kline
Joe and Dianna Collins
John and Clara Kohut
John and Nancy Minoletti
John and Sharon Kirk
John Anke
John Dermengian
John Hiatt
John Stocketti
Josh Alpert
Judee Jaeckel
Kathleen McKinney Oberst
Lawrence and Catherine Leyrer
Lawrence and Helen McClay
Leon and Agnes Bly
Loretta Moffatt Rossi
Louis and Julia Heard
Louise and Wallace Clark
Lynn Zonge
Marcel Belong
Mariano and Ronald Alpine
Mark Perdriau
Mary Tyler
Matthew Wilkin
Merita Moulton
Michael Polito
Michel Etcheverry
Mike Griswold
Mike McGinty
Mildred Morgan
Neil Weikel
Nevada Outdoor Recreation Society
Norman and Emelia Pollard
Owen Manning
Patsy Ruth Johnson
Paul Hickey
Paul Hickey
Pete Goicoechea
Philip Joujon-Roche
Philip Rubert
Phyllis Sanders
Ravonna Lassle
Ray and Christina Sawyer
Rev. James and Katherine Runya
Rex Collingwood
Richard DeLong
Richard L. Fornof
Richard Moorehead
Richard Tisue
Robert and Barbara Sauers
Robert and Bessie Brendahl
Robert and Connie Welch
Robert Barnhill
Robert Del Gagnon
Robert Herrera
Robert Littlefield
Robert Low
Robert Potthast
Robert Raymond Kautz
Rodney and Hilda Veto
Roy Risi
Samuel Penrod
Thomas Spencer
Tim and Sandie Halpin
Tom and Patsy Tomera
Tom Meal
Uhalde Family Trust
Valerie Randall
Vemalley and Virginia McCold
Vincent and Connie Camillieri
William and Luhree Riggs
William Cox IV
William Kohbarger
William O'Neil Jensen
William or Linda Dante

APPENDIX C

METHODOLOGY FOR QUANTIFYING EXISTING CONDITIONS, RATING IMPACTS, AND CONDUCTING SENSITIVITY ANALYSES

FALCON TO GONDER PROJECT

C.1 METHODOLOGY FOR QUANTIFYING EXISTING CONDITIONS

The following methodology was developed to compare the environmental effects of the five route alternatives for the Falcon to Gonder transmission line project and to identify the preferred alternative. This appendix is provided as supporting background information for the discussion of the route selection methodology summarized in Section 3.20 of this EIS.

Step 1 - The first step was to document existing environmental conditions in the study area. To facilitate this process, the route alternatives were broken down into segments and labeled A through L.

As shown below and in Figure ES-1, many of the segments are shared by several route alternatives.

- Crescent Valley (a) route alternative (Segments A-B-F-G-I-J)
- Crescent Valley (b) route alternative (Segments A-B-F-H-I-J)
- Pine Valley (a) route alternative (Segments A-C-D-F-G-I-J)
- Pine Valley (b) route alternative (Segments A-C-D-F-H-I-J)
- Buck Mountain route alternative (Segments A-C-E-J)

Information about existing conditions along each of the segments was then gathered through field surveys, research of existing maps and relevant documents and interviews (e.g., with Native American tribal representatives). When feasible and appropriate for this analysis, data on existing conditions was plotted and quantified using geographic information systems (GIS) and other techniques. A matrix summary of this data is provided in Figure C-1.

The matrix spreadsheets use mileposts and fill patterns to reflect existing conditions along each of the segments, as well as numeric totals in the far right column. The figure contains a separate matrix[1] for each segment, which shows the total length of the segment, information about existing transmission lines and access roads, and other evaluation factors. The data displayed in the matrices was selected based on its ability to be quantified, as well as its anticipated importance and usefulness in identifying the preferred route alternative.

In most cases, the matrix reflects the number of linear miles that the transmission line would pass directly through a particular resource or land use condition. To capture the line's proximity to sensitive sites that are near, but not on, the proposed centerline (e.g., sage grouse leks) a circle with a defined radius was drawn around each site and the length of the centerline that intersects the circle was measured. For fault and road crossings, the matrix provides the total number and locations of these crossings.

Step 2 - Calculate Miles of Environmental Impacts for Each Route Alternative: The quantitative data for individual segments was tallied to identify the miles of impacts associated with each of the route alternatives. For example, the Pine Valley (a) route alternative consists of Segments A + C + D + F + G + I + J.

[1] The matrix is divided into ¼-mile increments or "cells". If an environmental resource or condition exists anywhere within that ¼-mile area, the cell is shaded in, similar to the technique of rounding up a decimal number. The numeric totals in the far right column of the matrix, however, reflect accurate measurements in terms of the number of miles that a condition exists along the segment or the total number of sites.

Step 3 - Assign Impact Ratings (High-Medium-Low): The next step was to assign an "impact rating" of High, Medium or Low to ensure that the results reflect the fact that some impacts would be greater than others. To facilitate the quantitative analysis, impact ratings were assigned the following numeric values, as shown in the Impact Rating Score column of the following tables.

Impact Rating	Score
High	3
Medium	2
Low	1

Step 4 - Identify Relative Importance of Impacts: Certain species/sites/resources are more sensitive and afforded higher levels of regulatory protection than others. Therefore, each impact in the following tables received a "relative importance" rating. For example, since sage grouse are listed by the BLM and Nevada Division of Wildlife as a sensitive species and ferruginous hawk are listed by the U.S. Fish and Wildlife Service as a species of concern, impacts to these species were given a higher relative importance rating.

These ratings reflect the relative importance of the impacts compared with others in the same resource category (e.g., wildlife). It does not reflect the relative importance of impacts between different categories (i.e., wildlife impacts are not rated relative to visual impacts).

Step 5 - Calculate Scores and Rank Route Alternatives: To identify the environmentally preferred route alternative, scores were calculated by adding the total number of miles of impact for each resource and multiplying that number by the relative importance and impact rating. Tables 3.20-1 through 3.20-5 compare the scores of the five alternatives. For example, Table 3.20-1 indicates that the Pine Valley (b) route would have the greatest impact on mule deer while the Buck Mountain route would have the least.

Then, to obtain an overall picture of how the routes rank within the larger categories (e.g., wildlife resources, invasive weeds, cultural resources, and visual resources), scores for each of the five route alternatives were totaled and ranked from 1 to 5 at the bottom of the tables. This enables an overall ranking to be assigned to identify the route with the fewest impacts (a rating of 1) to the greatest impacts (a rating of 5).

Finally, the rankings for each category are displayed in a summary table for direct comparison. As shown in Table 3.20-5, the Pine Valley (a) alternative has the fewest impacts in three of the four categories. The only category in which another route alternative scores better is invasive weeds. This is largely due to the fact that the two Crescent Valley route alternatives contain more areas of existing noxious weed infestation and existing transmission lines. Consequently, the Crescent Valley route alternatives would have the fewest miles of new disturbances. The Pine Valley (a) alternative is ranked third for invasive weed impacts.

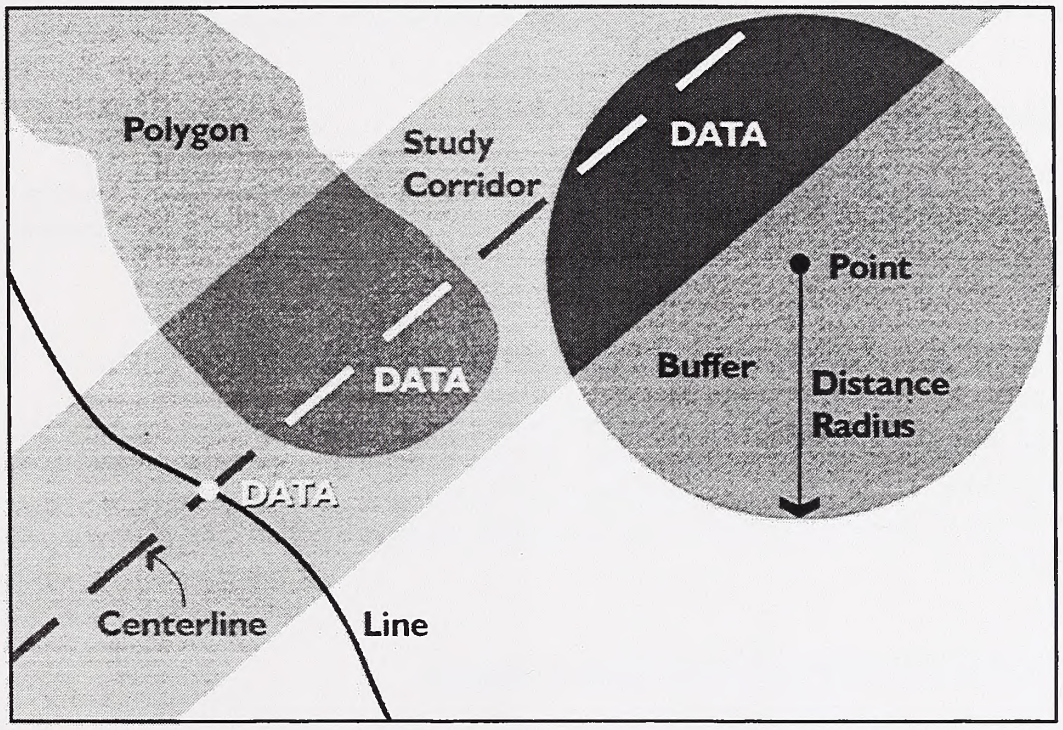
IDENTIFYING THE ENVIRONMENTALLY PREFERRED ROUTE ALTERNATIVE

This methodology leads to the conclusion that **the Pine Valley (a) route alternative is the environmentally preferred alternative.** A number of sensitivity analyses were conducted to test the methodology and the conclusions about the Pine Valley (a) alternative to see if changing the relative importance would change the scores and outcome. As shown in the following section, the sensitivity analyses proved that the methodology is valid and the overall rankings remained largely the same. Tables 3.20-1 through 3.20-5 display the results of the methodology.

QUANTIFYING EXISTING CONDITIONS

The following methods were used to quantify existing conditions along the transmission line routes. This information explains how the corridor data summary in Figure C-1 of the EIS was produced.

In most cases, the totals in the right hand column of Figure C-1 reflect the number of linear miles that the transmission line would pass directly through a particular resource or land use condition. To capture the line's proximity to sensitive sites that are near but not on the proposed centerline, a circle with a defined radius was drawn around each site and the length of the centerline that intersects the circle was measured. For fault and road crossings, the right hand column provides the total number and locations of these crossings.



The following describes how each of the evaluation factors in Figure C-1 was measured.

BIOLOGICAL RESOURCES

MULE DEER WINTER RANGE

This evaluation factor is represented by the number of linear miles of mule deer winter range that are crossed by the centerline of the proposed transmission line.

TWO-MILE RADIUS FOR SAGE GROUSE LEKS

Sage grouse leks were identified and mapped from protocol-level surveys done in spring 1999 and spring 2000 for the proposed transmission line. A two-mile radius was mapped around each lek that was sighted during the surveys. This evaluation factor is represented by the number of linear miles that the centerline of the proposed transmission line transects the two-mile radius buffer around a lek.

TWO-MILE RADIUS FOR HISTORICAL SAGE GROUSE LEKS

The NDOW Statewide Digital Database presents sage grouse leks sighted from 1960 to 1994. A two-mile radius was mapped around each lek in the database. This evaluation factor is represented by the number of linear miles that the centerline of the proposed transmission line transects the two-mile radius buffer around a lek.

HALF A MILE RADIUS FOR FERRUGINOUS HAWK NESTS

Ferruginous hawk nests were identified and mapped from wildlife baseline surveys done in spring 1999 for the proposed transmission line. A half-mile radius was mapped around each nest that was sighted during the survey. This evaluation factor is represented by the number of linear miles where each half-mile radius around a ferruginous hawk nest crosses the centerline of the proposed transmission line.

FERRUGINOUS HAWK NESTING TERRITORY

This evaluation factor is represented by the number of linear miles of ferruginous hawk nesting territory (as mapped by Pete Bradley, NDOW) that are crossed by the centerline of the proposed transmission line.

HALF A MILE RADIUS FOR BURROWING OWL BURROWS

Burrowing owl burrows were identified and mapped from wildlife baseline surveys done in spring 1999 and spring 2000 for the proposed transmission line. A half-mile radius was mapped around each burrow that was sighted during the survey. This evaluation factor is represented by the number of linear miles where each half-mile radius around a burrowing owl burrow crosses the centerline of the proposed transmission line.

HALF A MILE RADIUS FOR GOLDEN EAGLE NESTS

Golden eagle nests were identified and mapped from wildlife baseline surveys done in spring 1999 for the proposed transmission line. A half-mile radius was mapped around each nest that was sighted during the survey. This evaluation factor is represented by the number of linear miles where each half-mile radius around a golden eagle nest crosses the centerline of the proposed transmission line.

HALF A MILE RADIUS FOR PYGMY RABBIT BURROWS

Pygmy rabbit burrows were identified and mapped from wildlife baseline surveys done in spring 1999 for the proposed transmission line. A half-mile radius was mapped around each burrow that was sighted during the survey. This evaluation factor is represented by the number of linear miles where each half-mile radius around a pygmy rabbit burrow crosses the centerline of the proposed transmission line.

VEGETATION TYPES

The 13 vegetation types (i.e., basin big sagebrush, mountain big sagebrush, Wyoming big sagebrush, black sagebrush, low sagebrush, salt desert shrub, riparian/wetland, pinyon/juniper woodland, winterfat, greasewood, crested wheatgrass, cultivated, developed/disturbed) and the noxious weeds are considered evaluation factors. For the matrix, the five sagebrush communities were combined based on their similarity. The resulting 10 evaluation factors for vegetation resources are represented by the number of

linear miles of each vegetation group that are crossed by the centerline of the proposed transmission line. The sum of the linear miles for each factor accounts for 100% of the coverage along the proposed route segments. In the matrix's graphic representation of the vegetation groups, there is overlap among some groups. The overlap occurs in order to ensure that small vegetation groups (e.g., riparian/wetland, and noxious weeds) are shown where they occur in ¼ mile segments that are dominated by another vegetation group.

BURN AREAS

Burn areas include areas that burned in 1999 and a small area located near the L re-route that likely burned in 1998. Burn areas are considered a separate category because the burn areas are "an overlay" of the plant community types already included in the vegetation evaluation factors previously described. This evaluation factor portrays the linear miles of burn areas that are crossed by the centerline of the proposed transmission line.

SPECIAL-STATUS PLANT

One population of Pennell Draba (*Draba pennellii*) was identified along the proposed transmission line corridor approximately 200 feet north of Segment J at Hercules Gap. This special-status plant population is located within the 500-foot corridor, but it is not located on the centerline. Therefore, it would not be portrayed by the linear miles crossed by the centerline. To account for this special status plant population, it is graphically represented as an occurrence within the 500 foot-wide corridor in the matrix.

CULTURAL RESOURCES

TRADITIONAL CULTURAL PROPERTIES

Traditional Cultural Properties (TCPs) within the 500 ft. study corridor were identified by Penny Rucks, subconsultant to Summit Envirosolutions, in 1999 – 2000. As the boundaries of these potential TCPs have not yet been determined, (and are confidential), no mileage figures for these have been given. Only total numbers of TCPs per segment are available.

SIGNIFICANT OR UNEVALUATED HISTORIC SITES

Significant or unevaluated historic sites within the 500 ft. study corridor were identified by Summit Envirosolutions in 1999 – 2000. While the locations of these historic sites have been mapped in GIS, this information is considered confidential and is therefore not available for publication in the document. Consequently, only total numbers of sites per segment are provided.

SIGNIFICANT OR UNEVALUATED PREHISTORIC SITES

Significant or unevaluated prehistoric sites within the 500 ft. study corridor were identified by Summit Envirosolutions in 1999 – 2000. As with the historic sites, the locations of these prehistoric sites are considered confidential and is therefore not available for publication in the document. Consequently, only total numbers of sites per segment are provided.

SIGNIFICANT CULTURAL SITE

Significant cultural sites being considered in the visual impacts analysis include the Shoshone Wells, Palisades/Eureka Railroad and the Pony Express Trail.

CULTURAL VISUAL IMPACT LEVEL

Of particular concern are cultural resource sites where the integrity of the surrounding landscape is important to the context of the site. In these cases, the influence of the intrusion of the proposed transmission line on the context of the cultural resource site should be an additional consideration in determining visual impacts.

VISUAL RESOURCES

KOP LOCATION

The route was visually inspected from various public roads and vantage points to develop an overall assessment of the potential impacts by segment. In consultation with BLM, 29 Key Observation Points (KOPs) were established to assess the potential project impacts on sensitive visual resources, scenic landscapes, and vistas along the proposed transmission route. KOPs are located (1) Along major or significant travel corridors (e.g., Interstate 80, Highway 50, Highway 306, and Highway 278), (2) At or near cultural, historic, and prehistoric sites (e.g., Pony Express Trail, Eureka-Palisade Railroad, the Geysers); and (3) Near residential areas (e.g., Crescent Valley, Warm Springs Ranch). Locations were selected to be typical views of the proposed transmission line as seen by a casual viewer and to portray potential impacts that could occur along the route.

NUMBER OF MILES LINE IS VISIBLE FROM KOP

This factor represents the number of linear miles of the proposed transmission line that would be visible from the 29 KOPs.

VRM IMPACT LEVEL

This evaluation factor is based on the standard VRM impact assessment process which calls for a contrast rating procedure that evaluates the proposed transmission line against the major features in the existing landscape using the basic design elements of form, line, color, and texture and assigning a level of contrast. The results of which are then compared against the VRM Class objectives to determine a level of impact.

MILES IN SENSITIVE BLM VRM CLASS II

This factor represents the number of linear miles of the proposed transmission that would be located within VRM Class II areas. The objective of this VRM class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Data were obtained from GIS mapping efforts using BLM VRM Classification data.

MILES IN SENSITIVE BLM VRM CLASS III

This factor represents the number of linear miles of the proposed transmission line that would be located within VRM Class III areas. The objective of this VRM class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should

repeat the basic elements found in the predominant natural features of he characteristic landscape. Data were obtained from GIS mapping efforts using BLM VRM Classification data.

LAND USE

URBAN/RESIDENTIAL

This land use category includes all lands developed and disturbed by humans within the proposed project centerline. This data was obtained from the Developed/Disturbed category from the vegetation survey completed in 1999-2000 by Summit Envirosolutions. Developed or disturbed areas may include rural residences, farm structures and related out-buildings, parking lots, driveways, and back yards. Urban/Residential land uses on three mile-wide study corridor were obtained from US Fish & Wildlife Service GAP database for Nevada.

OCCUPIED HOMES WITHIN 1,000 FEET

This land use category includes all occupied residential uses (ranches houses, mobile homes, and travel trailers) within 1,000 feet of the project centerline. This data was obtained from a Stantec helicopter field survey using GPS (geographic positioning system) technology and analyzed with GIS by EDAW, Inc.

AGRICULTURE

This land use category includes all cultivated lands within the proposed project centerline. This data was obtained from the Cultivated category from the vegetation survey completed in 1999-2000 by Summit Envirosolutions. This category does not include grazing lands as nearly the entire project area is within BLM grazing allotments. Agricultural land uses on three mile-wide study corridor were obtained from US Fish & Wildlife Service GAP database for Nevada.

MINING DISTRICT

Data for mining districts within the proposed project centerline was obtained from the Nevada Bureau of Mines & Geology GIS sources districts in the project area. While mining districts are widespread throughout the region, and may contain active mining claims and active mining operations (open pit mines), no active mining operations would be crossed by the proposed transmission line. These districts primarily represent areas with potential mining prospects, and are policy-based designations. There is no certainty that mining will occur in these areas.

NUMBER OF PAVED ROAD CROSSINGS

Paved roadways are dispersed throughout the project area and provide the main transportation routes in this portion of the state. The proposed project would cross a number of paved roadways, including Interstate I-80 and Highways 50,-93, 306, 278, and 892. Information on paved roadway crossings was obtained from GIS data provided by Stantec.

NUMBER OF DIRT ROAD CROSSINGS

Numerous dirt roads are dispersed throughout the project area. The proposed project would cross a number of improved dirt roads (graded, maintained, partially engineered), as well as unimproved dirt

roads (4WD trails, primitive roads). Information on dirt roadway crossings was obtained from GIS data provided by Stantec.

NUMBER OF BLM LAND USE AUTHORIZATIONS CROSSED

The BLM provides a number of authorizations of private uses on public lands. This data was obtained from the BLM Land Records 2000 database (1999 data). BLM land use authorizations crossed by the proposed project would primarily include rights-of-way for federal, state, and local roads, private transmission and telephone lines, and an oil and gas pipeline.

LAND OWNERSHIP

PUBLIC LAND - BLM

Public lands crossed by the proposed project includes lands managed by three BLM field offices in the project area; Ely, Elko, and Battle Mountain Field Offices. Approximately 80% of the land in the project area is managed by the BLM. Data were obtained from Nevada statewide GIS mapping sources for public ownership.

PRIVATE PROPERTY

Private property crossed by the proposed project include any non-BLM managed land owned by individuals or corporations. Approximately 20% of the land in the project area is privately owned. Very little of the private land that would be traversed by the proposed project is developed. Data were obtained from Nevada statewide GIS mapping sources for public ownership.

ACTIVE MINING CLAIMS IN OR NEAR ROW

The proposed project would cross a number of active mining claims. Active claims indicate that there is a legal claim on the land allowing mining activities to occur if recoverable materials exist there, and if it would be economically feasible to recover them. It does not indicate areas of active mining operations. Active claims in or near the ROW were provided by Douglas Hirschman, Independent Mineral Landman, consultant to SPPC.

WATER RESOURCES

NUMBER OF SPRINGS AND WELLS WITHIN ¼ MILE

Springs and wells were identified and their distances to the proposed transmission line were measured from USGS 1:24000 topographic maps. While the mapping of springs is likely to be fairly accurate; the location of new wells or existing wells that have since been abandoned may not be accurately represented.

FLOOD INUNDATION RISK

Areas susceptible to flood inundation were identified primarily through GIS using NRCS soil series attribute data where annual inundation may occur for at least 1 week on an occasional basis or at least 2 days on a frequent basis. The generalized assessment of inundation risk using the soils data was supplemented by interpretations of general geomorphological conditions using USGS 1:24,000 scale

topographic maps. Such interpretations identify natural flood plain areas of watercourses where flood inundation can be recognized as a hazard.

FLASH FLOOD HAZARD

Flash flood hazards were identified through interpretation of physiographic conditions using USGS topographic maps at the 1:24,000 scale. Areas with the proximity of a high mountain range drained by steep gradient tributary water courses that join together in the main stem at lower altitude were considered to be potentially vulnerable to flash flooding.

SOILS

HIGH WATER ERODIBILITY

The matrix expresses the number of linear miles that the centerline of the proposed transmission corridor crosses soils with a high erosion potential. For the purposes of this analysis, an evaluation of erosion was limited to water, where water erosion potential was considered to greater than 8, based on NRCS established ratings (see Section 3.2 Soils).

NO RECLAMATION CONSTRAINTS

The matrix presents the linear miles of soils with no constraints (see Section 3.2 Soils) that are crossed by the centerline of the proposed transmission line. Areas with no soil constraints are likely to be suitable for reclamation with minimal mitigation.

STEEP SLOPES

The matrix presents the linear miles of soils with steep slopes (greater than 15%) that are crossed by the centerline of the proposed transmission line. Areas with steep slopes generally have higher potential for soil erosion, mass wasting, and slope instability, which can present constraints during construction and reclamation.

MAJOR FAULT CROSSING

Major faults crossed by the proposed transmission line were identified primarily from a 1:100,000 mapping source provided by the Nevada Bureau of Mines & Geology GIS data. Information was confirmed and, in certain cases, supplemented by the 1:250,000 scale sources published for each of the local area

C.2 RATING IMPACTS

The following assumptions were used to formulate the impact ratings used in Section 3.20 of the EIS, *Comparison of Route Alternatives*. Please refer to Tables 3.20-1 through 3.20-5.

C.2.1 WILDLIFE

Mule Deer Winter Range: If the transmission line would cross mule deer winter range, the impact is considered "Low" after mitigation.

Sage Grouse Leks (Sighted in 1999 and 2000 surveys): If the transmission line would cross within a two-mile radius of sage grouse leks (sighted in the 1999 and 2000 surveys), the impact is considered "Low" after mitigation.

Sensitive Sage Grouse Leks (Sighted in 1999 and 2000 surveys): Those surveyed leks that would be within a direct line of sight of the proposed transmission line are designated as "sensitive," and the impact is considered "Medium" after mitigation.

Historical Sage Grouse Leks: If the transmission line would cross within a two-mile radius of historical sage grouse leks, the impact is considered "Low" after mitigation.

Ferruginous Hawk Nests: If the transmission line would cross within a half-mile radius of ferruginous hawk nests, the impact is considered "Low" after mitigation.

Ferruginous Hawk Nesting Territory: If the transmission line would cross ferruginous hawk nesting territory, the impact is considered "Low" after mitigation.

Burrowing Owl Burrows: If the transmission line would cross within a half-mile radius of burrowing owl burrows, the impact is considered "Low" after mitigation.

Golden Eagle Nests: If the transmission line would cross within a half-mile radius of golden eagle nests, the impact is considered "Low" after mitigation.

Pygmy Rabbit Burrows: If the transmission line would cross within a half-mile radius of pygmy rabbit burrows, the impact is considered "Low" after mitigation.

C.2.2 INVASIVE NONNATIVE SPECIES

The following factors are representative of potential noxious weed and cheatgrass impact areas. They best characterize areas in terms of the potential spread of existing infestations or vulnerability to new introductions following disturbance to soil or vegetation.

Existing Noxious Weed Infestation: Where the transmission line corridor and associated facilities sites are located in infested areas, impacts from construction, operations, and maintenance activities are considered "Low" after mitigation and reclamation.

Burned areas: If the transmission line centerline would cross recently (1999) burned areas, the impact is considered "Low" after mitigation and reclamation.

Undisturbed areas: Undisturbed areas include those areas characterized by all vegetation types (see "Vegetation Types" in Section A, above) other than "crested wheatgrass", "cultivated", and "developed/disturbed". If the transmission line centerline would cross undisturbed areas, the impact is considered "Low" after mitigation and reclamation.

New Non-parallel alignment: If the transmission line is in an area without an existing transmission line within 1,000 feet of the proposed new line, the impact is considered "Low" after mitigation and reclamation.

New centerline and spur road construction: If the transmission line is in an area in which new centerline or spur roads would be required, the impact is considered "Low" after mitigation and reclamation.

Access road improvements required: If the transmission line is in an area in which access road improvements would be required, the impact is considered "Low" after mitigation and reclamation.

C.2.3 VISUAL RESOURCES*

If the visual contrast of the proposed transmission line exceeds the VRM Class guidelines for an area, it would result in a "high" visual impact.

If the visual contrast of the proposed transmission line is fully at, but not, exceed the VRM Class guidelines for that area it would result in a "medium" visual impact.

If the visual contrast of the proposed transmission line is clearly less than the VRM Class guidelines for the area it would result in a "low" visual impact.

*Note: These ratings reflect the level of visual impacts before mitigation.

C.2.4 CULTURAL RESOURCES AND PALEONTOLOGY

Areas of Concern to Western Shoshone (within approximately 2 miles): The effects of the proposed transmission line on TCPs largely depend on the nature of the TCP itself. If the transmission line would substantially affect the character of a TCP site that is eligible for the NRHP for its spiritual qualities, the impact is considered "High."

If the transmission line would substantially affect a TCP site that is eligible for the NRHP for its traditional resource values but it would still be considered usable by the practitioners (e.g., a Rabbit Drive Area), or if the visible intrusion at a spiritual site is at some distance, the impact is considered "Medium."

If the transmission line were to be constructed in a location where the viewshed has been compromised by other modern intrusions and the transmission line would be only slightly visible from an NRHP-eligible TCP or other location of religious importance (considering topography and distance), the impact is considered "Low."

Significant or Unevaluated Prehistoric Sites Within the 500 ft Corridor: Impacts to prehistoric sites would be considered "High" if the sites are: 1) located on or near angle point towers, 2) larger than 1,000 feet long, and 3) located in areas of low access. Because angle point towers are difficult to relocate, sites larger than 1,000 feet are difficult to span, and sites within low access areas tend to have the highest integrity, these sites would likely be directly impacted from project construction, and are therefore considered a "High" impact.

All other significant or unevaluated prehistoric sites within the 500 ft. corridor have the potential for indirect impacts and are therefore considered "Medium." Indirect impacts include greater access and potential for looting.

Significant or Unevaluated Historic Sites Within the 500 ft Corridor: Impacts to historic sites are primarily concerned with the effect to the historic setting due to the visual intrusion of the transmission line. Impacts to historic sites would be rated "High" or "Medium" based on the same criteria as listed above for prehistoric sites. Also, if the transmission line would affect the site's setting such that it would be rendered ineligible for listing in the NRHP (i.e. if the project would significantly change the characteristics that qualify the site for listing in the NRHP), the impact is considered "High." It would also be considered a "High" impact if a historic site is within 150 feet of a tower location or 45 feet from an access route, because of the potential for construction impacts. In addition, effects to historical archaeological sites eligible under criterion D would be considered "High" if these effects significantly compromise the site's data potential.

If the transmission line would have a moderate effect on the qualities that qualify the site for listing in the NRHP under criteria A, B, or C, but is not likely to render it ineligible, the impact is considered "Medium."

If the transmission line would have a slight visual effect on a site, but would not disqualify it for listing in the NRHP, the impact is considered "Low."

Visibility from Eureka-Palisade Railroad: If the transmission line would be relatively close to the Eureka-Palisade Railroad and would be visible due to local topography (i.e. flat landscape), the impact is considered "High."

If the transmission line would be relatively close to the Eureka-Palisade Railroad but would be separated by a hill or other topography that would block many of the views of the line, the impact is considered "Medium." Or if the transmission line is relatively far away but within a flat landscape, the impact would also be considered "Medium."

If the transmission line would be blocked by local topography and would be relatively far away, the impact is considered "Low."

Historic Ranches Within 2 Miles: If the transmission line would be visible from within 2 miles of an historic ranch, the impact is considered "Medium."

C.3 SENSITIVITY ANALYSES

To test the validity of the methodology for identifying the preferred route (as explained in Chapter 3.0), a series of sensitivity analyses was performed by the BLM ID Team at a workshop held on October 3 and 4, 2000. The objective was to determine to what degree the relative importance ratings would need to be changed to alter the final rankings of the alternative routes. The following eight sensitivity analyses were performed to test the methodology:

> **Test 1 - Wildlife: Treat all wildlife relative importance as 1.** Result: This scenario puts sensitive sage grouse leks on a par with other resources. When all wildlife categories are given the same relative importance rating, the number of linear miles through the wildlife habitats determines the results. Since the Buck Mountain route is the shortest of all the alternatives, it rises to number one in the rankings. However, for reasons discussed in the Wildlife and Special-Status Species sections of the EIS, this scenario does not provide a true reflection of the environmentally preferred route, as Buck Mountain contains the most pristine and least fragmented habitat of all the routes. Therefore, this scenario was rejected.

Test 2 - Wildlife: Treat all wildlife relative importance as 1, but sensitive sage grouse leks as 8. Result: Increasing the relative importance of sensitive sage grouse leks identified in 1999 and 2000 field surveys to a rating of 8 and lowering the relative importance of other wildlife to 1 does not change the outcome dramatically. Pine Valley (a) still scores the best among all routes. However, Pine Valley (b) and Buck Mountain rankings switch. This scenario essentially confirms the original findings.

Test 3 - Wildlife: Treat all wildlife relative importance as 1, but sensitive leks and other leks identified during the 1999 and 2000 field surveys as 8. Result: This test produces the same results as Test 2.

Tests 4 - Noxious Weeds: Increase the relative importance of burned areas to 50. Result: No change in overall ranking of the routes, but Buck Mountain scores even worse than before.

Test 5 - Noxious Weeds: Increase undisturbed category to a relative importance of 3. Result: This test does not dramatically alter the results, except that Pine Valley (b) and Buck Mountain switch places, ranking 5th and 4th respectively. However, because burned areas and new non-parallel lines could also potentially play a role in the spread of cheatgrass, the ID Team decided to increase the relative importance of burned areas to 20 and new non-parallel lines to 50 in the table used in the EIS (see Table 3-2 in Chapter 3.0).

Test 6 - Elevate the relative importance of Traditional Cultural Properties (TCPs) from 3 to 6. Result: No change in overall ranking of the routes, but Crescent Valley routes score even worse. Also, regulations do not support assigning TCPs a greater relative importance than the other cultural resources. Thus, the original scenario was deemed most appropriate.

Test 7 – Show the miles of new non-parallel transmission line as part of the visual resources test. Result: It was decided that this was a useful factor for evaluating visual impacts in concert with the VRM class ratings. A decision was made to combine the 75/25% rankings to produce an integrated visual resources ranking, as shown in Figure 3.20-4 in the EIS.

Test 8 - Private ownership of properties along the routes. Result: Buck Mountain would have the fewest number of private owners (i.e., about 40) directly affected by right-of-way easements (personal communication with John Berdrow, Sierra Pacific Power Company, October 4, 2000). Pine Valley (a) would have the next fewest, while Crescent Valley (b) would have the most (about 70). Because the numbers are so close and private property owners would be compensated by the utility for the easements, it was determined that this information was not highly useful as a distinguishing characteristic in the route comparison. It is, however, provided in the EIS and RMP Amendments under Section 3.13 *Land Use and Access.*

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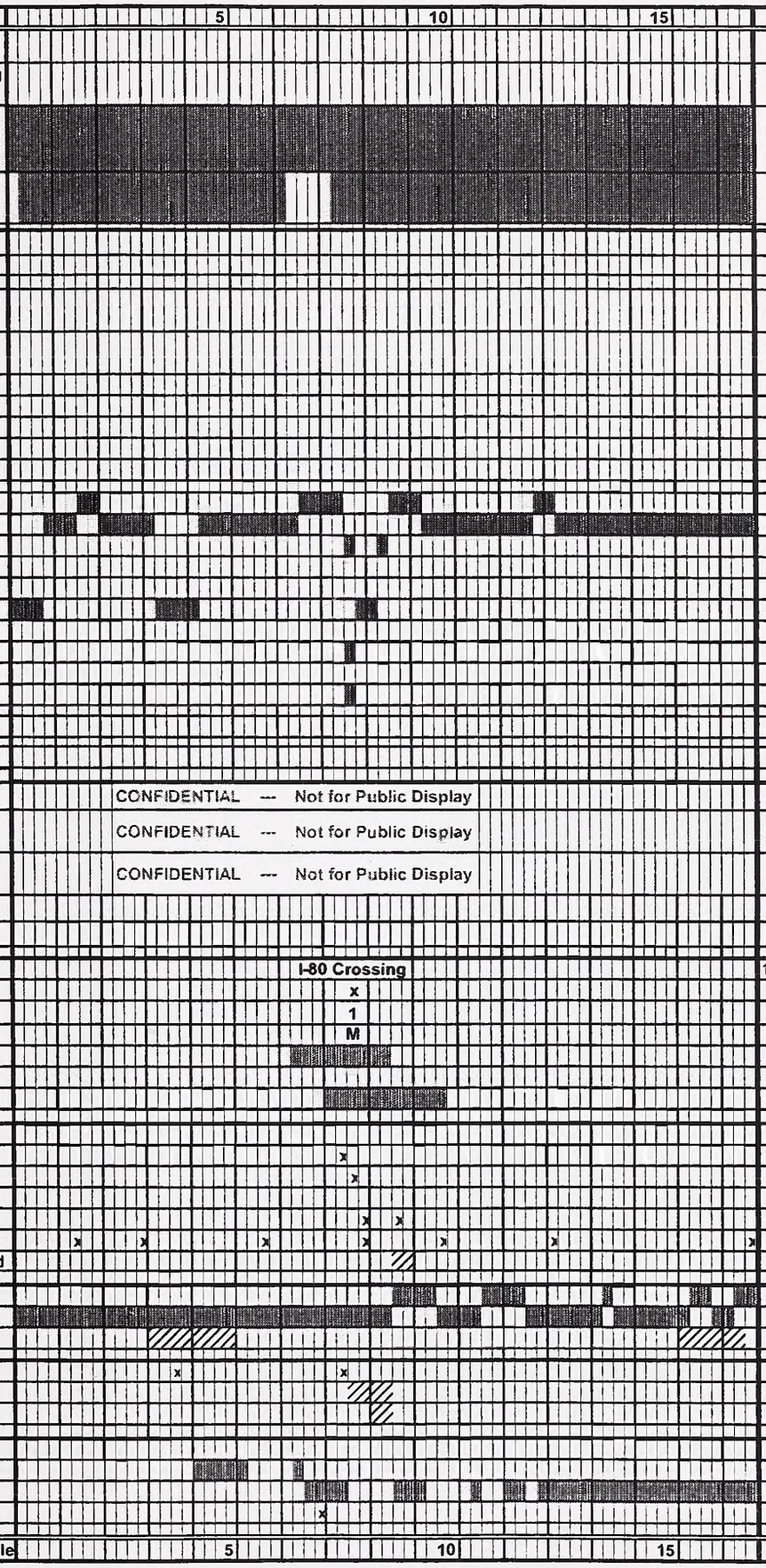
Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment A

Total Length = 16.7 miles

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	0
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	0
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)	16.7
	Accessibility	Use of Parallel Access Road for Construction	14.9
1	BIOLOGICAL RESOURCES		
	Wildlife	Mule Deer Winter Range	0
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)	0
		Two-Mile Radius for Historical Sage Grouse Leks	0
		Half-Mile Radius for Ferruginous Hawk Nests	0
		Ferruginous Hawk Nesting Territory	0
		Half-Mile Radius for Burrowing Owl Burrows	0
		Half-Mile Radius for Golden Eagle Nests	0
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation Types	Sagebrush	3.1
		Salt Desert Shrub	11.3
		Riparian/Wetland	0.2
		Pinyon/Juniper Woodland	0
		Winterfat	0
		Greasewood	2
		Crested Wheatgrass	0
		Cultivated	0.1
		Developed/Disturbed	0
		Noxious Weeds	0.1
	Burn Areas	1999 Burn Areas	0
	Special-Status Plant	Pennell Draba *(Draba pennellii)*	0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft.corridor	0 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	3 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	
		Cultural Visual Impact Level	
3	VISUAL RESOURCES	KOP Name	1 Hwy X-ing
		KOP Location	1 KOP
		KOP Number	
		VRM Impact Level	1 Medium
		# of Miles line is visible from KOP	2.3
		Miles in sensitive BLM VRM Class II	0.0
		Miles in sensitive BLM VRM Class III	1.6
4	LAND USE	Urban / Residential	0
		Occupied Home within 1000 ft	1 unit
		Agriculture	0.1
		Mining District	0
		No. of paved road crossings	1
		No. of dirt road crossings	7
		No. of BLM Land Use Authorizations crossed	2
5	LAND OWNERSHIP	Public Land - BLM	3.4
		Private Property	13.3
		Active Mining Claims in or near ROW	3
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	2
		Flood Inundation Risk	0.4
		Flash Flood Hazard	0.5
7	SOILS	High Water Erodibility	0
		No Reclamation Constraints	1.6
		Steep Slope (slopes > 15%)	7.5
		Major Fault Crossing	1



Legend:
- Zone of factor extent (rounded up to 1/4 mile)
- General zone containing factor(s)
- x — Approximate location of factor

Figure C - 1 (Segment A)

Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment B (via L)

Total Length = 62.1 miles

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	18.6
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	8.1
	Accessibility	Use of Parallel Access Road for Construction	35.4
1	BIOLOGICAL RESOURCES		31.8
	Wildlife	Mule Deer Winter Range	
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in I 999 and 2000 surveys)	2
		Two-Mile Radius for Historical Sage Grouse Leks	11.1
		Half-Mile Radius for Ferruginous Hawk Nests	12.6
		Ferruginous Hawk Nesting Territory	0.9
		Half-Mile Radius for Burrowing Owl Burrows	19.2
		Half-Mile Radius for Golden Eagle Nests	0.6
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation Types	Sagebrush	0
		Salt Desert Shrub	35.3
		Riparian/Wetland	16.6
		Pinyon/Juniper Woodland	0
		Winterfat	1.7
		Greasewood	0
		Crested Wheatgrass	7.5
		Cultivated	0.8
		Developed/Disturbed	0
		Noxious Weeds	0
	Burn Areas	1999 Burn Areas	0.1
	Special-Status Plant	Pennell Draba *(Draba pennellii)*	7.1
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	0
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	4 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	4 Sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	15 sites
		Cultural Visual Impact Level	3 Sites (2 confidential)
3	VISUAL RESOURCES	Name of Key Observation Point (KOP)	1 High, 1 Med, 1 Low
		KOP Location	1 Hwy X-ing, 1 Res, 1 Other
		KOP Number	6 KOPs
		VRM Impact Level	1 High, 2 Med, 3 Low
		# of Miles line is visible from KOP	10
		Miles in sensitive BLM VRM Class II	0
		Miles in sensitive BLM VRM Class III	2.4
4	LAND USE	Urban / Residential	0
		Occupied homes within 1000 ft	11 units
		Agriculture	0
		Mining District	10.7
		No. of paved road crossings	1
		No. of dirt road crossings	37
		No. of BLM Land Use Authorizations crossed	5
5	LAND OWNERSHIP	Public Land - BLM	50.1
		Private Property	10.5
		Active Mining Claims in or near ROW	49
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	3
		Flood Inundation Risk	4.6
		Flash Flood Hazard	0.5
7	SOILS	High Water Erodibility	1.4
		No Reclamation Constraints	19
		Steep Slope (slopes > 15%)	9.4
		Major Fault Crossing	4

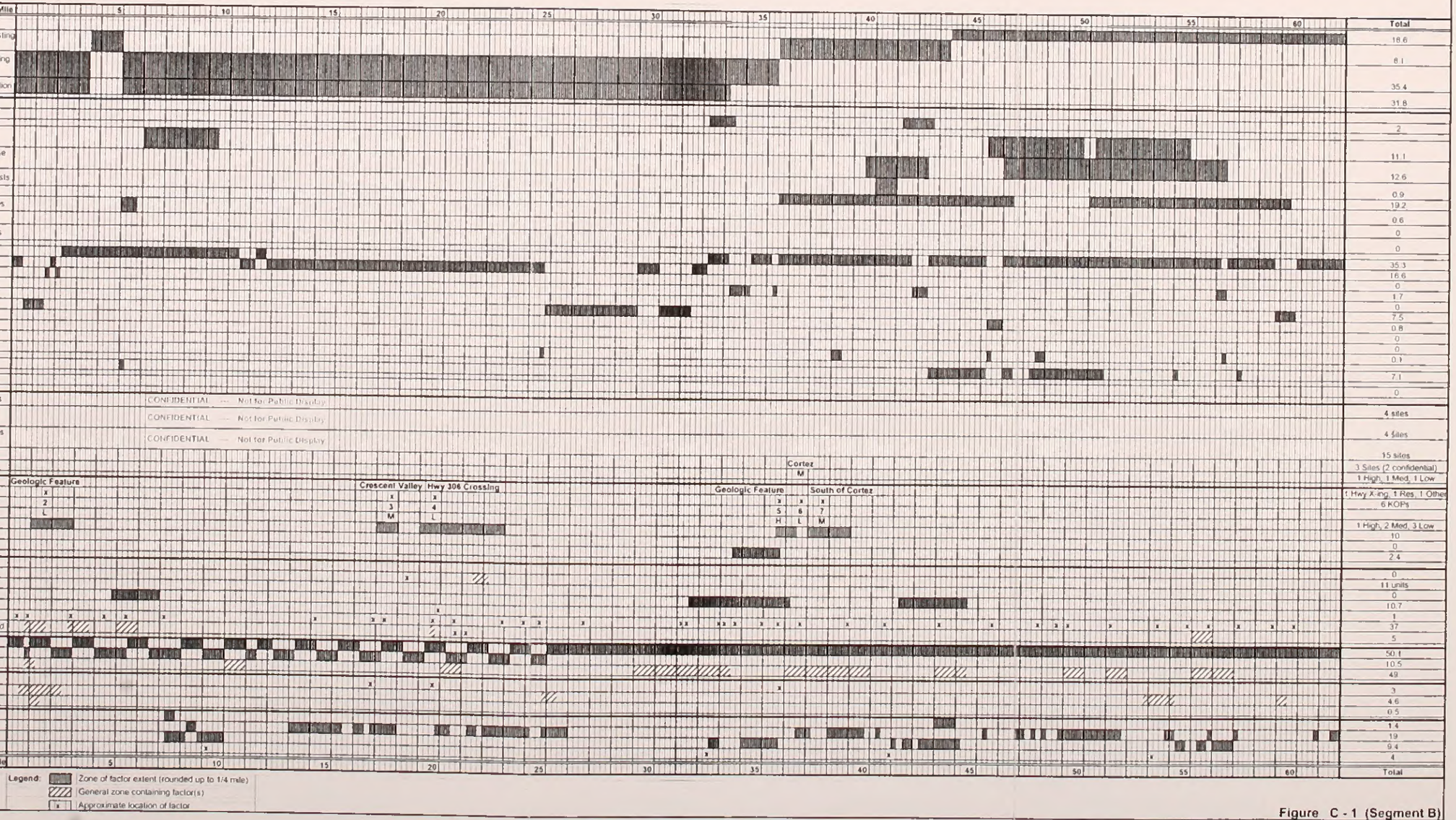


Figure C - 1 (Segment B)

Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment C

Total Length = 35.7 miles

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	35.7
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	0
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)	0
	Accessibility	Use of Parallel Access Road for Construction	
1	BIOLOGICAL RESOURCES		
	Wildlife	Mule Deer Winter Range	7.16
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)	3.3
		Two-Mile Radius for Historical Sage Grouse Leks	4.6
		Half-Mile Radius for Ferruginous Hawk Nests	0
		Ferruginous Hawk Nesting Territory	4.3
		Half-Mile Radius for Burrowing Owl Burrows	1.7
		Half-Mile Radius for Golden Eagle Nests	0
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation types	Sagebrush	23.5
		Salt Desert Shrub	6.1
		Riparian/Wetland	0
		Pinyon/Juniper Woodland	0
		Winterfat	0
		Greasewood	2.9
		Crested Wheatgrass	3.1
		Cultivated	0
		Developed/Disturbed	0
		Noxious Weeds	0
	Burn Areas	1999 Burn Areas	9.5
	Special-Status Plant	Pennell Draba *(Draba pennellii)*	0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	0 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	4 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	1 Site (confidential)
		Cultural Visual Impact Level	1 Low
3	VISUAL RESOURCES	KOP Name	Geologic Feature / Hwy 306 Crossing
		KOP Location	x / x
		KOP Number	8 / 9
		VRM Impact Level	L / M
		# of Miles line is visible from KOP	1 Hwy X-ing
		Miles in sensitive BLM VRM Class II	2 KOPs
		Miles in sensitive BLM VRM Class III	1 Med, 1 Low
4	LAND USE	Urban / Residential	6
		Occupied homes within 1000 ft	0
		Agriculture	1.6
		Mining District	0
		No. of paved road crossings	3.8
		No. of dirt road crossings	1
		No. of BLM Land Use Authorizations crossed	17
			2
5	LAND OWNERSHIP	Public Land - BLM	20.7
		Private Property	15
		Active Mining Claims in or near ROW	1
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	3
		Flood Inundation Risk	2.6
		Flash Flood Hazard	10
7	SOILS	High Water Erodibility	10.7
		No Reclamation Constraints	10.8
		Steep Slope (slopes > 15%)	12.6
		Major Fault Crossing	3
		Mile	Total

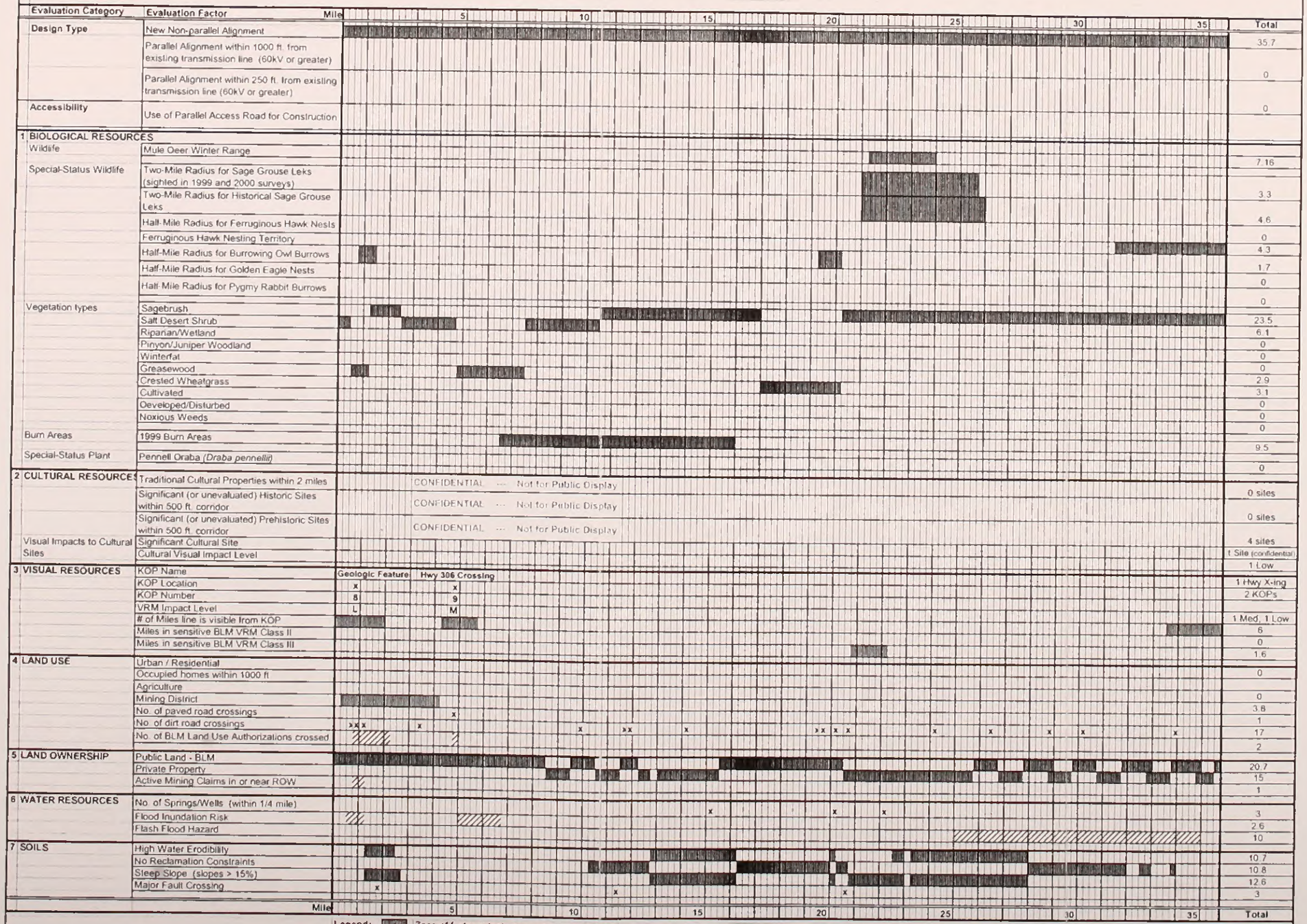


Figure C - 1 (Segment C)

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Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment D

Total Length = 19.5 miles

	Evaluation Category	Evaluation Factor	Mile	Total
	Design Type	New Non-parallel Alignment		19.5
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)		0
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)		0
	Accessibility	Use of Parallel Access Road for Construction		0
1	BIOLOGICAL RESOURCES			
	Wildlife	Mule Deer Winter Range		0
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)		0
		Two-Mile Radius for Historical Sage Grouse Leks		0
		Half-Mile Radius for Ferruginous Hawk Nests		0
		Ferruginous Hawk Nesting Territory		0
		Half-Mile Radius for Burrowing Owl Burrows		0
		Half-Mile Radius for Golden Eagle Nests		0
		Half-Mile Radius for Pygmy Rabbit Burrows		0
	Vegetation Types	Sagebrush		13.8
		Salt Desert Shrub		0
		Riparian/Wetland		0
		Pinyon/Juniper Woodland		0
		Winterfat		0
		Greasewood		3.2
		Crested Wheatgrass		2.5
		Cultivated		0
		Developed/Disturbed		0
		Noxious Weeds		0
	Burn Areas	1999 Burn Areas		0
	Special-Status Plant	Pennell Draba *(Draba pennellii)*		0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	CONFIDENTIAL --- Not for Public Display	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display	0 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display	3 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	Eureka-Palisades RR Grade	1 Cult Site
		Cultural Visual Impact Level	H	1 High
3	VISUAL RESOURCES	KOP Name	Hwy 278 Rest Area	1 Rd X-ing
		KOP Location	x x	2 KOPs
		KOP Number	10 11	
		VRM Impact Level	M L	1 Med, 1 Low
		# of Miles line is visible from KOP		5
		Miles in sensitive BLM VRM Class II		0
		Miles in sensitive BLM VRM Class III		0
4	LAND USE	Urban / Residential		0
		Occupied Homes within 1000 ft		0
		Agriculture		0
		Mining District		0
		No. of paved road crossings		0
		No. of dirt road crossings	x x xxx x x x	8
		No. of BLM Land Use Authorizations crossed		3
5	LAND OWNERSHIP	Public Land - BLM		19.5
		Private Property		0
		Active Mining Claims in or near ROW		0
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)		0
		Flood Inundation Risk		0.7
		Flash Flood Hazard		0.7
7	SOILS	High Water Erodibility		0
		No Reclamation Constraints		9.7
		Steep Slope (slopes > 15%)		0
		Major Fault Crossing	x	1
		Mile	5 10 15 20	Total

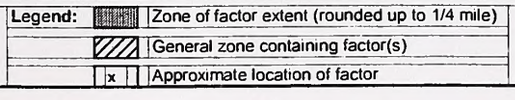


Figure C - 1 (Segment D)

Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment E

Total Length = 74.8 miles

Evaluation Category	Evaluation Factor
Design Type	New Non-parallel Alignment
	Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)
	Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)
Accessibility	Use of Parallel Access Road for Construction
1 BIOLOGICAL RESOURCES	
Wildlife	Mule Deer Winter Range
Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)
	Two-Mile Radius for Historical Sage Grouse Leks
	Half-Mile Radius for Ferruginous Hawk Nests
	Ferruginous Hawk Nesting Territory
	Half-Mile Radius for Burrowing Owl Burrows
	Half-Mile Radius for Golden Eagle Nests
	Half-Mile Radius for Pygmy Rabbit Burrows
Vegetation Types	Sagebrush
	Salt Desert Shrub
	Riparian/Wetland
	Pinyon/Juniper Woodland
	Wintertat
	Greasewood
	Crested Wheatgrass
	Cultivated
	Oeveloped/Disturbed
	Noxious Weeds
Burn Areas	1999 Burn Areas
Special-Status Plant	Pennell Draba *(Draba pennellii)*
2 CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles
	Significant (or unevaluated) Historic Sites within 500 ft. corridor
	Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor
Visual Impacts to Cultural Sites	Significant Cultural Site
	Cultural Visual Impact Level
3 VISUAL RESOURCES	KOP Name
	KOP Location
	KOP Number
	VRM Impact Level
	# of Miles line is visible from KOP
	Miles in sensitive BLM VRM Class II
	Miles in sensitive BLM VRM Class III
4 LAND USE	Urban / Residential
	Occupied Homes within 1000 ft
	Agriculture
	Mining District
	No. of paved road crossings
	No. of dirt road crossings
	No. of BLM Land Use Authorizations crossed
5 LAND OWNERSHIP	Public Land - BLM
	Private Property
	Active Mining Claims in or near ROW
6 WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)
	Flood Inundation Risk
	Flash Flood Hazard
7 SOILS	High Water Erodibility
	No Reclamation Constraints
	Steep Slope (slopes > 15%)
	Major Fault Crossing
	Mile

Mile markers: 5, 10, 15, 20, 25, 30, 35, 40, 45

CONFIDENTIAL -- Not for Public Display

CONFIDENTIAL -- Not for Public Display

CONFIDENTIAL -- Not for Public Display

Eureka-Palisades RR Grade

Pony Express Trail

Visual Impacts to Cultural Sites: Cultural Visual Impact Level: H; H

KOP Name: Hwy 278 Crossing; Railroad Pass

KOP Location: x; x; x; x

KOP Number: 12; 13; 14; 15

VRM Impact Level: M; M; M; H

# of Miles line is visible from KOP: H

Legend:

- Zone of factor extent (rounded up to 1/4 mile)
- General zone containing factor(s)
- x — Approximate location of factor

Continues on next worksheet

Figure C - 1 (Segment E) -- p.1

Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS (continued)

Segment E

Total Length = 74.8 miles

Evaluation Category	Evaluation Factor	Mile 50	55	60	65	70	75	Total
Design Type	New Non-parallel Alignment							74.8
	Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)							0
	Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)							0
Accessibility	Use of Parallel Access Road for Construction							0
1 BIOLOGICAL RESOURCES								
Wildlife	Mule Deer Winter Range							0
Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)							11.1
	Two-Mile Radius for Historical Sage Grouse Leks							9
	Half-Mile Radius for Ferruginous Hawk Nests							5.2
	Ferruginous Hawk Nesting Territory							16.6
	Half-Mile Radius for Burrowing Owl Burrows							0
	Half-Mile Radius for Golden Eagle Nests							0.7
	Half-Mile Radius for Pygmy Rabbit Burrows							0.9
Vegetation Types	Sagebrush							60.7
	Salt Desert Shrub							0
	Riparian/Wetland							0
	Pinyon/Juniper Woodland							12
	Winterfat							0
	Greasewood							0.9
	Crested Wheatgrass							1.2
	Cultivated							0
	Developed/Disturbed							0
	Noxious Weeds							0
Burn Areas	1999 Burn Areas							0
Special-Status Plant	Pennell Draba *(Draba pennellii)*							0
2 CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	CONFIDENTIAL --- Not for Public Display						0 sites
	Significant (or unevaluated) Historic Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display						3 sites
	Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display						38 sites
Visual Impacts to Cultural Sites	Significant Cultural Site	Warm Springs Ranch						3 Cultural Sites
	Cultural Visual Impact Level	M						2 High, 1 Medium
3 VISUAL RESOURCES	KOP Name		Buck Pass					2 Rd X-ing, 1 Other
	KOP Location	x	x					6 KOPs
	KOP Number	16	17					
	VRM Impact Level	M	H					2 High, 4 Medium
	# of Miles line is visible from KOP							14.75
	Miles in sensitive BLM VRM Class II							0
	Miles in sensitive BLM VRM Class III							27.4
4 LAND USE	Urban / Residential							0
	Occupied homes within 1000 ft							13.2
	Agriculture							0
	Mining District							13.2
	No. of paved road crossings							1
	No. of dirt road crossings	x x	x	x x	x	x x x x x	x	45
	No. of BLM Land Use Authorizations crossed							6
5 LAND OWNERSHIP	Public Land - BLM							74.2
	Private Property							0.6
	Active Mining Claims in or near ROW							7
6 WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)					x		2
	Flood Inundation Risk							1.5
	Flash Flood Hazard				x			15
7 SOILS	High Water Erodibility							4.9
	No Reclamation Constraints							13.7
	Steep Slope (slopes > 15%)							20
	Major Fault Crossing					x		4
	Mile	50	55	60	65	70	75	Total

Legend:
- Zone of factor extent (rounded up to 1/4 mile)
- General zone containing factor(s)
- x Approximate location of factor

Figure C - 1 (Segment E) -- p.2

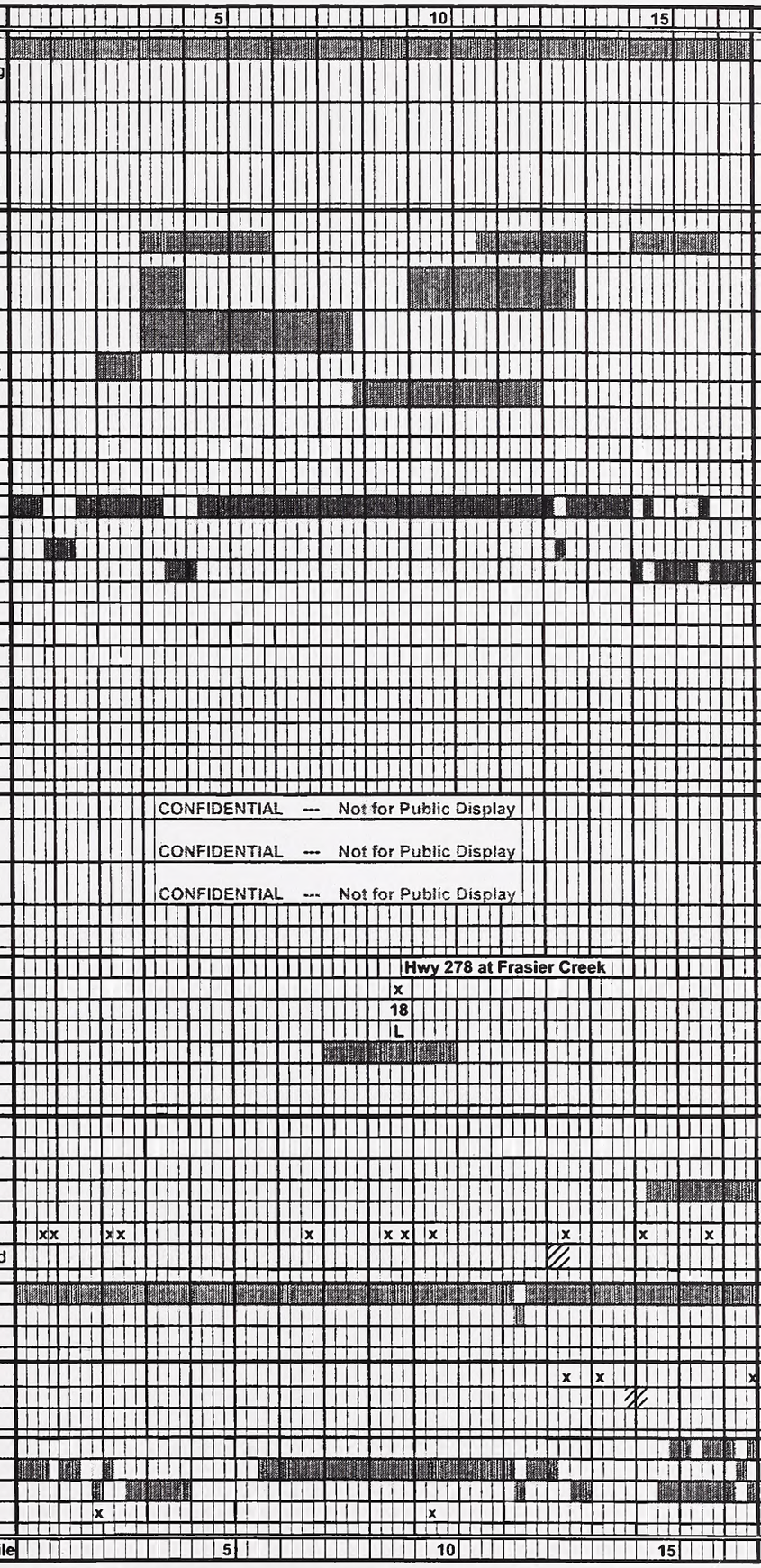
Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment F

Total Length = 16.8 miles

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	16.8
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	0
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)	0
	Accessibility	Use of Parallel Access Road for Construction	0
1	BIOLOGICAL RESOURCES		
	Wildlife	Mule Deer Winter Range	6.3
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)	4.8
		Two-Mile Radius for Historical Sage Grouse Leks	4.7
		Half-Mile Radius for Ferruginous Hawk Nests	0.9
		Ferruginous Hawk Nesting Territory	4.1
		Half-Mile Radius for Burrowing Owl Burrows	0
		Half-Mile Radius for Golden Eagle Nests	0
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation Types	Sagebrush	13.6
		Salt Desert Shrub	0
		Riparian/Wetland	0.5
		Pinyon/Juniper Woodland	2.6
		Winterfat	0
		Greasewood	0
		Crested Wheatgrass	0
		Cultivated	0
		Developed/Disturbed	0
		Noxious Weeds	0
	Burn Areas	1999 Burn Areas	0
	Special-Status Plant	Pennell Draba *(Draba pennellii)*	0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	7 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	10 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	
		Cultural Visual Impact Level	
3	VISUAL RESOURCES	KOP Name	
		KOP Location	1 KOP
		KOP Number	
		VRM Impact Level	1 Low
		# of Miles line is visible from KOP	3 mi.
		Miles in sensitive BLM VRM Class II	0
		Miles in sensitive BLM VRM Class III	0
4	LAND USE	Urban / Residential	0
		Occupied homes within 1000 ft	0
		Agriculture	0
		Mining District	2.6
		No. of paved road crossings	0
		No. of dirt road crossings	11
		No. of BLM Land Use Authorizations crossed	1
5	LAND OWNERSHIP	Public Land - BLM	16.5
		Private Property	0.3
		Active Mining Claims in or near ROW	0
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	3
		Flood Inundation Risk	0.5
		Flash Flood Hazard	0
7	SOILS	High Water Erodibility	1.3
		No Reclamation Constraints	8.4
		Steep Slope (slopes > 15%)	4.6
		Major Fault Crossing	2



Legend:
- Zone of factor extent (rounded up to 1/4 mile)
- General zone containing factor(s)
- x — Approximate location of factor

Figure C - 1 (Segment F)

Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment G

Total Length = 19.9 miles

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	17
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	2.9
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)	0
	Accessibility	Use of Parallel Access Road for Construction	0
1	BIOLOGICAL RESOURCES		
	Wildlife	Mule Deer Winter Range	1.7
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)	0
		Two-Mile Radius for Historical Sage Grouse Leks	0
		Half-Mile Radius for Ferruginous Hawk Nests	0.8
		Ferruginous Hawk Nesting Territory	17.8
		Half-Mile Radius for Burrowing Owl Burrows	0
		Half-Mile Radius for Golden Eagle Nests	0
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation Types	Sagebrush	18.3
		Salt Desert Shrub	0
		Riparian/Wetland	0
		Pinyon/Juniper Woodland	1.3
		Winterfat	0
		Greasewood	0.3
		Crested Wheatgrass	0
		Cultivated	0
		Developed/Disturbed	0
		Noxious Weeds	0
	Burn Areas	1999 Burn Areas	0
	Special-Status Plant Population	Pennell Draba *(Draba pennellii)*	0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	2 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	5 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	1 Cult Site
		Cultural Visual Impact Level	1 Medium
3	VISUAL RESOURCES	KOP Name	1 Hwy X-ing
		KOP Location	2 KOPs
		KOP Number	
		VRM Impact Level	2 Medium
		# of Miles line is visible from KOP	2
		Miles in sensitive BLM VRM Class II	0.5
		Miles in sensitive BLM VRM Class III	0
4	LAND USE	Urban / Residential	0
		Occupied homes within 1000 ft	0
		Agriculture	2
		Mining District	2
		No. of paved road crossings	1
		No. of dirt road crossings	9
		No. of BLM Land Use Authorizations crossed	3
5	LAND OWNERSHIP	Public Land - BLM	19.9
		Private Property	2
		No. Private Property Owners crossed	2
		Active Mining Claims	
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	3
		Flood Inundation Risk	0.5
		Flash Flood Hazard	0
7	SOILS	High Water Erodibility	4.1
		No Reclamation Constraints	14
		Steep Slope (slopes > 15%)	5.3
		Major Fault Crossing	2

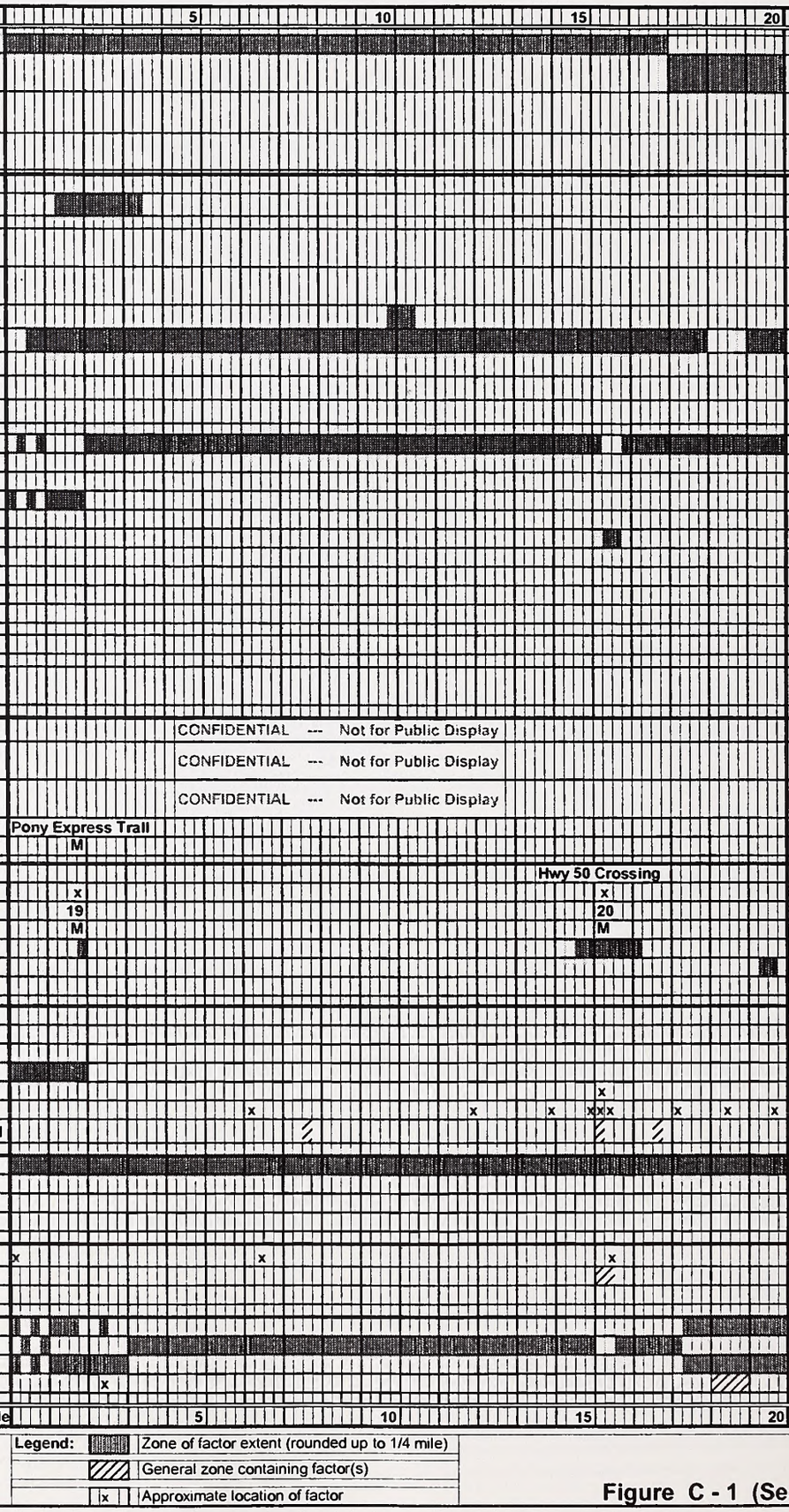


Figure C - 1 (Segment G)

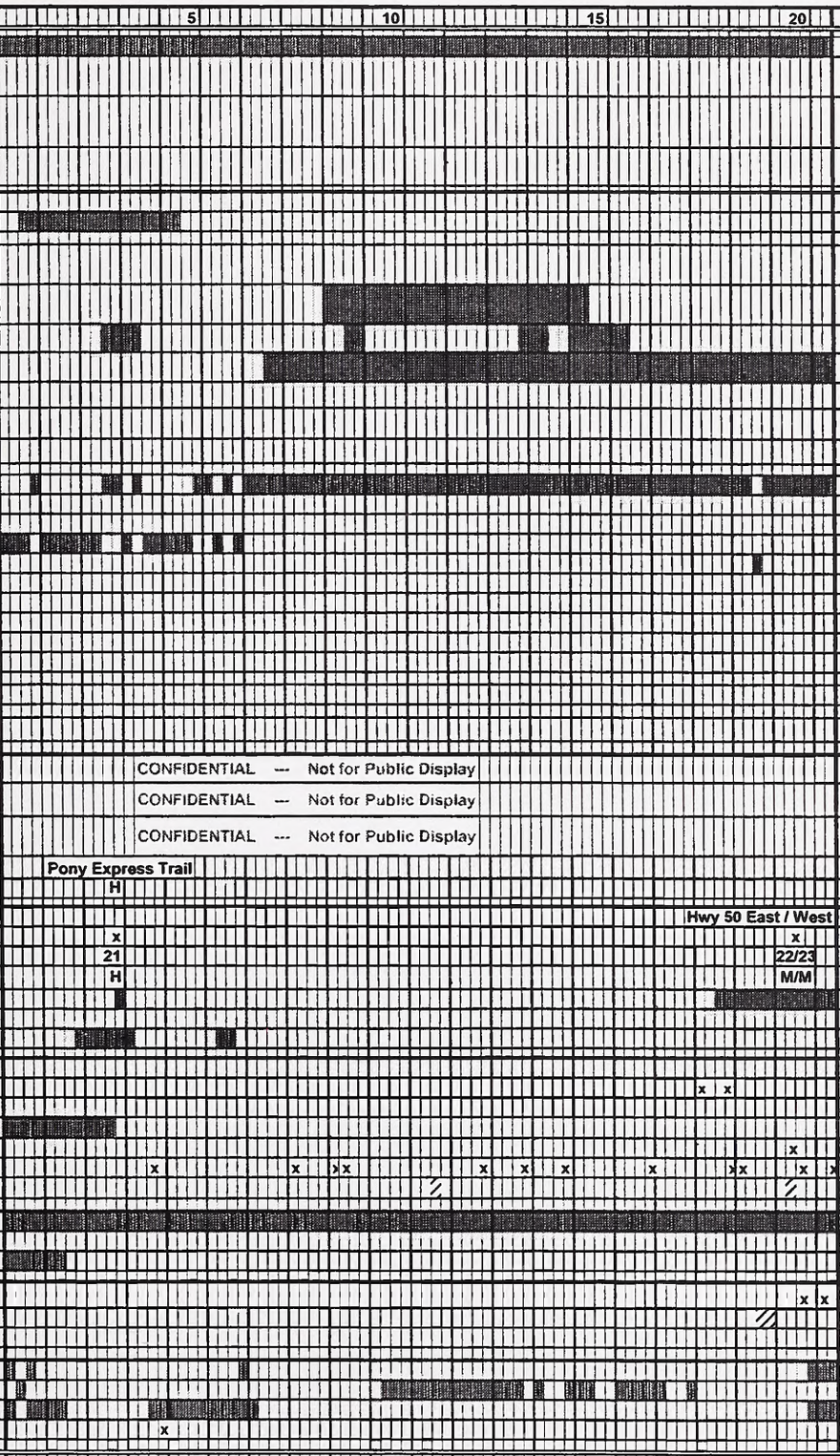
Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment H

Total Length = 20.4 miles

	Evaluation Category	Evaluation Factor	Mile	Total
	Design Type	New Non-parallel Alignment		20.4
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)		0
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)		0
	Accessibility	Use of Parallel Access Road for Construction		0
1	BIOLOGICAL RESOURCES			
	Wildlife	Mule Deer Winter Range		3.8
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)		0
		Two-Mile Radius for Historical Sage Grouse Leks		6.6
		Half-Mile Radius for Ferruginous Hawk Nests		2.4
		Ferruginous Hawk Nesting Territory		13.8
		Half-Mile Radius for Burrowing Owl Burrows		0
		Half-Mile Radius for Golden Eagle Nests		0
		Half-Mile Radius for Pygmy Rabbit Burrows		0
	Vegetation Types	Sagebrush		16.5
		Salt Desert Shrub		0
		Riparian/Wetland		0
		Pinyon/Juniper Woodland		2.7
		Winterfat		0.2
		Greasewood		0
		Crested Wheatgrass		0
		Cultivated		0
		Developed/Disturbed		0
		Noxious Weeds		0
	Burn Areas	1999 Burn Areas		0
	Special-Status Plant	Pennell Draba *(Draba pennellii)*		0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	CONFIDENTIAL --- Not for Public Display	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display	2 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display	5 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	Pony Express Trail	1 Cult Site
		Cultural Visual Impact Level	H	1 High
3	VISUAL RESOURCES	KOP Name	Hwy 50 East / West	2 Hwy X-ing
		KOP Location	x x	3 KOP
		KOP Number	21 22/23	
		VRM Impact Level	H M/M	1 High, 2 Med
		# of Miles line is visible from KOP		3.75
		Miles in sensitive BLM VRM Class II		0
		Miles in sensitive BLM VRM Class III		2.1
4	LAND USE	Urban / Residential		0
		Occupied homes within 1000 ft	x x	3 units
		Agriculture		0
		Mining Distnct		2.7
		No. of paved road crossings	x	1
		No. of dirt road crossings	x x x x x x x x x x x x	12
		No. of BLM Land Use Authorizations crossed		2
5	LAND OWNERSHIP	Public Land - BLM		20.4
		Private Property		0
		Active Mining Claims in or near ROW		●
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	x x	2
		Flood Inundation Risk		0.5
		Flash Flood Hazard		0
7	SOILS	High Water Erodibility		1.6
		No Reclamation Constraints		7.1
		Steep Slope (slopes > 15%)		4.8
		Major Fault Crossing	x	1
		Mile	5 10 15 20	Total



Legend:
- Zone of factor extent (rounded up to 1/4 mile)
- General zone containing factor(s)
- x — Approximate location of factor

Figure C - 1 (Segment H)

Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment I

Total Length = 30.3 miles

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	0
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	23.4
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)	6.9
	Accessibility	Use of Parallel Access Road for Construction	0
1	BIOLOGICAL RESOURCES		
	Wildlife	Mule Deer Winter Range	0
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)	0
		Two-Mile Radius for Historical Sage Grouse Leks	16.3
		Half-Mile Radius for Ferruginous Hawk Nests	0.5
		Ferruginous Hawk Nesting Territory	9.9
		Half-Mile Radius for Burrowing Owl Burrows	0
		Half-Mile Radius for Golden Eagle Nests	0
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation Types	Sagebrush	17.8
		Salt Desert Shrub	4.7
		Riparian/Wetland	0.1
		Pinyon/Juniper Woodland	2.9
		Winterfat	0.1
		Greasewood	3.1
		Crested Wheatgrass	0.4
		Cultivated	0.7
		Developed/Disturbed	0.2
		Noxious Weeds	0.2
	Burn Areas	1999 Burn Areas	0
	Special-Status Plant	Pennell Draba *(Draba pennellii)*	0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	4 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	18 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	1 Cult Site
		Cultural Visual Impact Level	1 Med
3	VISUAL RESOURCES	KOP Name	
		KOP Location	1KOP
		KOP Number	
		VRM Impact Level	1 High
		# of Miles line is visible from KOP	0.5
		Miles in sensitive BLM VRM Class II	0
		Miles in sensitive BLM VRM Class III	5.4
4	LAND USE	Urban / Residential	0.2
		Occupied homes within 1000 ft	3 units
		Agriculture	0.7
		Mining District	4.5
		No. of paved road crossings	2
		No. of dirt road crossings	23
		No. of BLM Land Use Authorizations crossed	9
5	LAND OWNERSHIP	Public Land - BLM	28
		Private Property	2.3
		Active Mining Claims in or near ROW	7
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	6
		Flood Inundation Risk	0
		Flash Flood Hazard	0
7	SOILS	High Water Erodibility	1.9
		No Reclamation Constraints	8.8
		Steep Slope (slopes > 15%)	8.8
		Major Fault Crossing	2

Mile: 5 10 15 20 25 30 — Total

CONFIDENTIAL ... Not for Public Display

Eureka-Pallisade RR Grade

Legend:
- Zone of factor extent (rounded up to 1/4 mile)
- General zone containing factor(s)
- x Approximate location of factor

Figure C - 1 (Segment I)

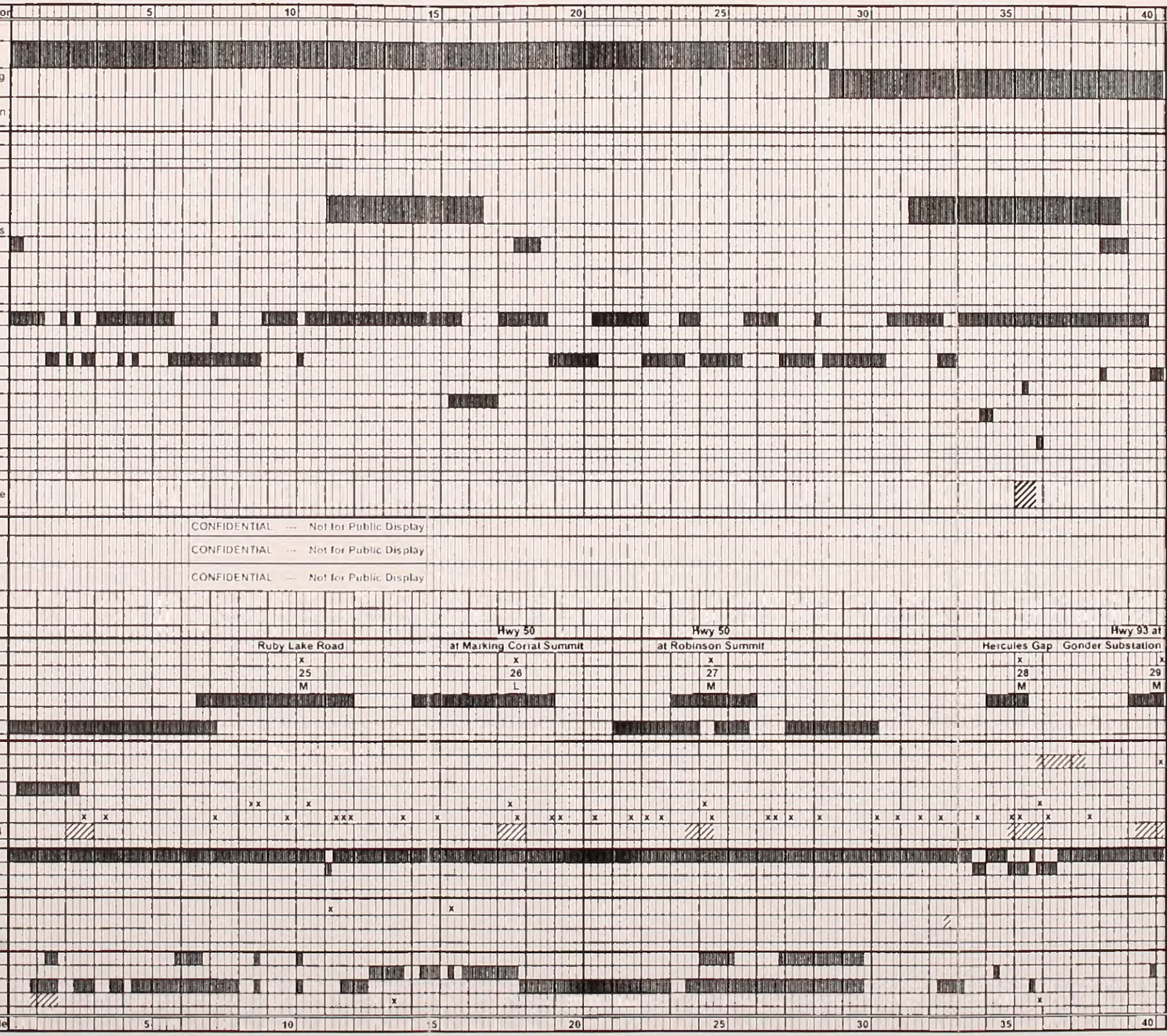
Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

Segment J

Total Length = 40.1 miles

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	0
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	28.3
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)	11.7
	Accessibility	Use of Parallel Access Road for Construction	0
1	BIOLOGICAL RESOURCES		
	Wildlife	Mule Deer Winter Range	0
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)	0
		Two-Mile Radius for Historical Sage Grouse Leks	12.1
		Half-Mile Radius for Ferruginous Hawk Nests	0
		Ferruginous Hawk Nesting Territory	2.3
		Half-Mile Radius for Burrowing Owl Burrows	0
		Half-Mile Radius for Golden Eagle Nests	0
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation Types	Sagebrush	24.9
		Salt Desert Shrub	0
		Riparian/Wetland	0
		Pinyon/Juniper Woodland	13.3
		Winterfat	0.4
		Greasewood	0.1
		Crested Wheatgrass	1.3
		Cultivated	0
		Developed/Disturbed	0
		Noxious Weeds	0
	Burn Areas	1999 Burn Areas	0
	Special Status Plant	* Pennell Draba *(Draba pennellii)* occurrence	(within 500 ft corridor)
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	CONFIDENTIAL --- Not for Public Display: 0
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display: 2 sites
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	CONFIDENTIAL --- Not for Public Display: 26 sites
	Visual Impacts to Cultural Sites	Significant Cultural Site	1 Site (confidential)
		Cultural Visual Impact Level	1 Low
3	VISUAL RESOURCES	KOP Name	Ruby Lake Road; Hwy 50 at Marking Corral Summit; Hwy 50 at Robinson Summit; Hwy 93 at Hercules Gap; Gonder Substation
		KOP Location	4 Rd X-ings
		KOP Number	5 KOPs
		VRM Impact Level	25; 26; 27; 28; 29
		# of Miles line is visible from KOP	M; L; M; M; M
		Miles in sensitive BLM VRM Class II	3 Med, 2 Low
		Miles in sensitive BLM VRM Class III	17 Mi.
			0
			14.5
4	LAND USE	Urban / Residential	0
		Occupied homes within 1000 ft	12 units
		Agriculture	0
		Mining District	2.1
		No. of paved road crossings	6
		No. of dirt road crossings	30
		No. of BLM Land Use Authorizations crossed	9
5	LAND OWNERSHIP	Public Land - BLM	37.7
		Private Property	2.3
		Active Mining Claims in or near ROW	0
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	2
		Flood Inundation Risk	0.1
		Flash Flood Hazard	0
7	SOILS	High Water Erodibility	6.2
		No Reclamation Constraints	4.4
		Steep Slope (slopes > 15%)	20
		Major Fault Crossing	3
		Mile	Total



* Pennell Draba (Oraba pennellii) was identified approximately 200 feet north of Segment J at Hercules Gap, but it is not located on the centerline. Therefore, it would not be portrayed by the linear miles crossed by the centerline. To account for this special status plant population, it is represented as occurring within the 500 foot-wide corridor in the matrix.

Legend:
- Zone of factor extent (rounded up to 1/4 mile)
- General zone containing factor(s)
- x — Approximate location of factor

Figure C - 1 (Segment J)

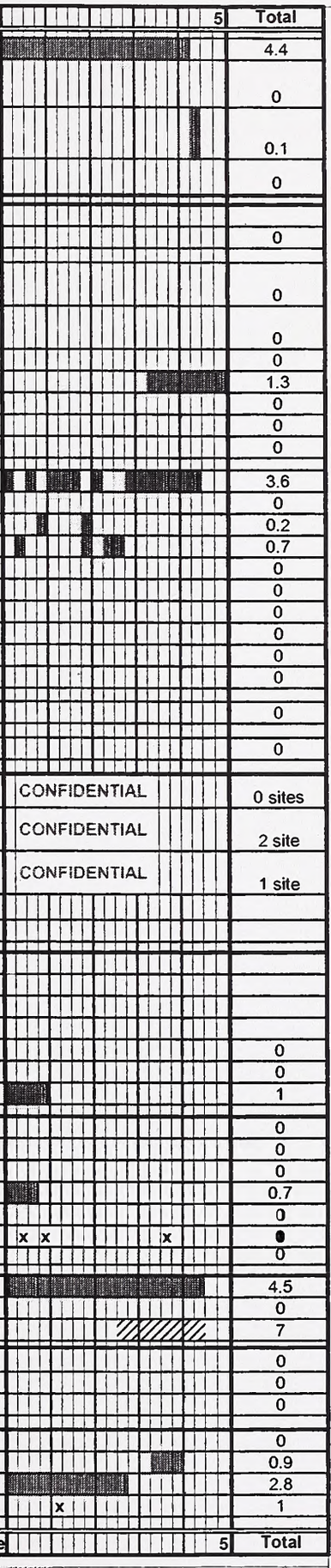
Falcon to Gonder Project EIS

CORRIDOR EVALUATION DATA SUMMARY - EXISTING CONDITIONS

K Re-route

Total Miles: 4.5

	Evaluation Category	Evaluation Factor	Total
	Design Type	New Non-parallel Alignment	4.4
		Parallel Alignment within 1000 ft. from existing transmission line (60kV or greater)	0
		Parallel Alignment within 250 ft. from existing transmission line (60kV or greater)	0.1
	Accessibility	Use of Parallel Access Road for Construction	0
1	BIOLOGICAL RESOURCES		
	Wildlife	Mule Deer Winter Range	0
	Special-Status Wildlife	Two-Mile Radius for Sage Grouse Leks (sighted in 1999 and 2000 surveys)	0
		Two-Mile Radius for Historical Sage Grouse Leks	0
		Half-Mile Radius for Ferruginous Hawk Nests	0
		Ferruginous Hawk Nesting Territory	1.3
		Half-Mile Radius for Burrowing Owl Burrows	0
		Half-Mile Radius for Golden Eagle Nests	0
		Half-Mile Radius for Pygmy Rabbit Burrows	0
	Vegetation Types	Sagebrush	3.6
		Salt Desert Shrub	0
		Riparian/Wetland	0.2
		Pinyon/Juniper Woodland	0.7
		Winterfat	0
		Greasewood	0
		Crested Wheatgrass	0
		Cultivated	0
		Developed/Disturbed	0
		Noxious Weeds	0
	Burn Areas	1999 Burn Areas	0
	Special-Status Plant	Pennell Draba *(Draba pennellii)*	0
2	CULTURAL RESOURCES	Traditional Cultural Properties within 2 miles	0 sites
		Significant (or unevaluated) Historic Sites within 500 ft. corridor	2 site
		Significant (or unevaluated) Prehistoric Sites within 500 ft. corridor	1 site
	Visual Impacts to Cultural Sites	Significant Cultural Site	
		Cultural Visual Impact Level	
3	VISUAL RESOURCES	KOP Name	
		KOP Location	
		KOP Number	
		VRM Impact Level	
		# of Miles line is visible from KOP	0
		Miles in sensitive BLM VRM Class II	0
		Miles in sensitive BLM VRM Class III	1
4	LAND USE	Urban / Residential	0
		Occupied homes within 1000 ft	0
		Agriculture	0
		Mining District	0.7
		No. of paved road crossings	0
		No. of dirt road crossings	0
		No. of BLM Land Use Authorizations crossed	0
5	LAND OWNERSHIP	Public Land - BLM	4.5
		Private Property	0
		Active Mining Claims in or near ROW	7
6	WATER RESOURCES	No. of Springs/Wells (within 1/4 mile)	0
		Flood Inundation Risk	0
		Flash Flood Hazard	0
7	SOILS	High Water Erodibility	0
		No Reclamation Constraints	0.9
		Steep Slope (slopes > 15%)	2.8
		Major Fault Crossing	1
		Mile	Total



Legend:

- Zone of feature extent
- General zone containing feature(s)
- x — Approximate location of feature

Figure C - 1 (K Re-route)

APPENDIX D

LAND USE INFORMATION

APPENDIX D
BLM LAND USE AUTHORIZATIONS CROSSED

Land Holder	Authorization Type	BLM Serial Number	Location (Township, Range, Section)
SEGMENT A			
Nevada DOT	Federal Highway ROW	NVN 58638	33N, 48E, 36
Williams Communication	Telephone line ROW	NVN 65550	33N, 48E, 34, 36
TOTAL		**2**	
SEGMENT B			
Lander County	Road ROW	NVN 60171	31N, 47E, 14
Nevada DOT	Federal Highway ROW	NVN 44669	29N, 47E, 24
Santa Fe Pacific	Electric transmission line ROW	NVN 60249	31N, 48E, 8
Southwest Gas Corp.	Oil and gas pipeline ROW	NVN 65084	31N, 48E, 2, 8, 10, 31N, 47E, 12
Wells Rural Electric*	Electric transmission line ROW	NVN 42324	25N, 50E, 3, 10, 15
TOTAL		**5**	
SEGMENT C			
Nevada DOT*	Federal Highway ROW	NVN 44712	31N, 48E, 24
Southwest Gas Corp.	Oil and gas pipeline ROW	NVN 65084	31N, 48E, 2, 8, 10, 31N, 47E, 12
TOTAL		**2**	
SEGMENT D			
Citizens Communication	Telephone line ROW	NVN 60911	27N, 52E, 2, 3, 7, 11
Mobil Oil Corporation	Road ROW	NVN 53379	25N, 51E, 3,
Wells Rural Electric*	Electric transmission line ROW	NVN 42324	27N, 52E, 6, 7
TOTAL		**3**	
SEGMENT E			
BLM	Road ROW, federal facility	NVN 55016	22N, 57E, 22, 27, 28, 33
Mt. Wheeler Power Inc.*	Electric transmission line ROW	NVN 5638	23N, 56E, 16, 17, 18, 19, 21, 22, 25, 26, 27, 36

Land Holder	Authorization Type	BLM Serial Number	Location (Township, Range, Section)
Nevada Bell*	Telephone line ROW	NVN 58497	28N, 52E, 16, 21, 28, 32, 33
Nevada DOT*	Federal Highway ROW	NVN 11316	28N, 52E, 16, 21, 28, 32, 33
Wells Rural Electric*	Electric transmission line ROW	NVN 42324	28N, 52E, 16, 21, 22, 28, 32, 33
White Pine County*	Road ROW	NVN 50929	19N, 57E, 20N, 57E, 21N, 57E, 22N, 56E, 22N, 57E, 23N, 56E, 24N, 56E, 25N, 56E (various sections)
TOTAL		**6**	
SEGMENT F			
Eureka County	Road ROW	NVN 52540	23N, 51E, 10, 13, 14, 15, 23N, 52E, 18
TOTAL		**1**	
SEGMENT G			
Mt. Wheeler Power Inc.*	Electric transmission line ROW	NVN 47781	21N, 51E, 13, 21N, 52E, 10, 11, 12, 15, 16, 17, 18
Nevada Bell*	Telephone line ROW	NVN 10758	20N, 52E, 20, 25, 26, 27, 28, 29, 35, 36
Nevada DOT*	Federal Highway ROW	NVCC 21890	20N, 53E, 5, 8, 9, 16, 21, 28
TOTAL		**3**	
SEGMENT H			
Mt. Wheeler Power Inc.*	Electric transmission line ROW	NVN 47781	21N, 51E, 13, 21N, 52E, 10, 11, 12, 15, 16, 17, 18
Nevada DOT*	Federal Highway ROW	NVN 4979	20N, 53E, 28, 29 30, 33, 34, 35
TOTAL		**2**	
SEGMENT I			
Mt. Wheeler Power Inc.*	Electric transmission line ROW	NVN 5638	18N, 55E, 5, 19N, 53E, 54E, 55E (various sections)
Mt. Wheeler Power Inc.*	Electric transmission line ROW	NVN 29660	19N, 53E, 54E, 55E, 56E, 20N, 57E (various sections)
Mt. Wheeler Power Inc.	Electric transmission line ROW	NVN 61353	18N, 55E, 6, 19N, 55E, 31
Nevada Bell	Telephone line ROW	NVN 65765	18N, 55E, 19N, 53E, 54E, 55E, (various sections)
Nevada Bell*	Telephone line ROW	NVN 66126	19N, 55E, 56E, 57E (various sections)
Nevada DOT*	Federal Highway ROW	NVN 6317	20N, 53E, 28, 29, 30, 33, 34, 35
Nevada DOT	Federal Highway ROW	NVCC 22969	18N, 55E, 5, 19N, 55E, 28, 32, 33
Sierra Pacific*	Electric transmission line ROW	NVN 5253	19N, 53E, 54E, 55E, 56E, 57E, 20N, 53E (various sections)

Land Holder	Authorization Type	BLM Serial Number	Location (Township, Range, Section)
White Pine County*	Road ROW	NVN 50929	18N, 57E, 3, 19N, 54E, 26, 27, 19N, 55E, 19, 28, 29, 30
TOTAL		**9**	
SEGMENT J			
U.S. Forest Service Federal Highway ROW		NVN 57462	17N, 63E, 6, 9, 16, 21, 22, 18N, 63E, 31
Mt. Wheeler Power Inc.	Electric transmission line ROW	NVN 5485	17N, 64E, 8, 17, 18
Nevada Bell	Telephone line ROW	NVCC 17654	17N, 64E, 7, 18, 19, 30
Nevada Bell	Telephone line ROW	NVN 48145	17N, 63E, 6, 9, 16
Nevada Bell*	Telephone line ROW	NVN 66126	17N, 63E, 22, 23, 24, 18N, 59E, 19N, 58E (various sections)
Nevada DOT	Federal Highway ROW	NVN 4895	18N, 60E, 13, 14, 20, 21, 22, 29, 30
Nevada DOT	Federal Highway ROW	NVCC 20723	17N, 64E, 17, 18, 19, 30
Nevada DOT	Federal Highway ROW	NVN 23697	18N, 61E, 22, 26, 35, 36
White Pine County*	Road ROW	NVN 50929	18N, 58E, 5, 19N, 58E, 19, 20, 29, 32
TOTAL		**9**	

Source: BLM Land Records 2000 Database
* Same authorization is located near, or crosses, multiple project segments

APPENDIX D.1 PROPERTY INFORMATION for LAND USE POINTS by SEGMENT and DISTANCE

Source: EDAW GIS analysis using Stantec Helicopter reconnaissance (July, 2000) and Parcel Database

CASE_	FREQ	SEGMENT	T_C	DIST_ZONE	USE	USE_TYPE	UNITS	DESC	DISTANCE (feet)	LOCATION	COUNTY	APN	L_NAME	F_NAME
1	1	B-1	1	Within 1000 ft	Ind		1	BUS POWER PLANT-5	796		LANDER	010-510-13	HOSPAH COAL COMPANY	
2	1	A	1	Within 1000 ft	Res	mobile	1	RES SW-1	819		EUREKA	004-220-11	NEWMONT GOLO COMPANY	
3	1	A	2	1000 ft to 1.5 mi	Com	agric	1	BUS MISC-FEED LOT-5	3374	SUM PARCEL 004-160-01	EUREKA	004-210-01	ELKO LAND AND LIVESTOCK	
4	1	A	2	1000 ft to 1.5 mi	Ind	mine	1	mine area	1828		EUREKA	004-220-11	NEWMONT GOLD COMPANY	
5	1	A	2	1000 ft to 1.5 mi	Res	fixed	1	RES	1097		EUREKA	004-220-11	NEWMONT GOLD COMPANY	
6	1	A	2	1000 ft to 1.5 mi	Res	fixed	1	RES -4	2820	T31N R48E SEC 5 SW4NE4	EUREKA	005-010-06	MAYER-LYNN	JUDITH C
7	1	A	2	1000 ft to 1.5 mi	Res	fixed	1	RES -5	1440		EUREKA	004-220-11	NEWMONT GOLD COMPANY	
8	1	A	2	1000 ft to 1.5 mi	Res	fixed	1	RES MOD	2622	SUM PARCEL 004-160-01	EUREKA	004-210-01	ELKO LAND AND LIVESTOCK	
9	1	A	2	1000 ft to 1.5 mi	Res	mobile	1	RES SW	2592	SUM PARCEL 004-160-01	EUREKA	004-210-01	ELKO LAND AND LIVESTOCK	
10	1	B	1	Within 1000 ft	Ind	mine	1	BUS MINE-6	638		LANDER	007-250-25	BLM	
11	1	B	1	Within 1000 ft	Res	mobile	1	RES SW	165	LOT 7 TEHAMA MAP #184863B	LANDER	007-660-03	TEHAMA HOLDINGS INC	
12	1	B	1	Within 1000 ft	Res	mobile	1	RES SW-2	338	LOT 6 BLK 12 UN 2 CV	LANDER	007-273-06	MAYS	GORDON B
13	1	B	1	Within 1000 ft	Res	mobile	1	RES TT	55	LOT 11 TEHAMA MAP #184863B	LANDER	007-660-07	TEHAMA HOLDINGS INC	
14	1	B	1	Within 1000 ft	Res	mobile	4	RES 2SW 2TT	137	LOT 11 TEHAMA MAP #184863B	LANDER	007-660-07	TEHAMA HOLDINGS INC	
15	1	B	1	Within 1000 ft	Res	mobile	4	RES 2SW 2TT	193	LOT 5 TEHAMA MAP #184863B	LANDER	007-660-01	TEHAMA HOLDINGS INC	
16	1	B	2	1000 ft to 1.5 mi	Com		1	BUS ?	7698			pvt cresc	Private-Unspecified	
17	1	B	2	1000 ft to 1.5 mi	Ind	mine	1	BUS MINE-2	5092		LANDER	010-510-02	HOSPAH COAL COMPANY	
18	1	B	2	1000 ft to 1.5 mi	Ind	mine-related	1	BUS MINE EQUIP YARD	2003		LANDER	010-510-08	HOSPAH COAL COMPANY	
19	1	B	2	1000 ft to 1.5 mi	Ind	mine-related	1	BUS MINE MILL CORTEZ	2831		LANDER	007-430-01	BLM	
20	1	B	2	1000 ft to 1.5 mi	Public		1	BUS CO. COMPLEX	7245			pvt cresc	Private-Unspecified	
21	1	B	2	1000 ft to 1.5 mi	Res	fixed	1	RES H-5	5470	POR OF N2S2 24/28/47 40.001 AC	LANDER	007-360-04	WINTLE	JAY AND GRACE
22	1	B	2	1000 ft to 1.5 mi	Res	fixed/mobile	4	RES H 3DW-3	5992	T28N R48E POR SEVERAL SECS	EUREKA	005-590-01	THE CORTEZ JOINT VENTURE	
23	1	B	2	1000 ft to 1.5 mi	Res	fixed/mobile	48	subdivison (est 3H 45DW)	4987			Multiple APNs	Multiple Names	
24	1	B	2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-1	5371	T21N R54E SECS 16 AND 17	EUREKA	007-250-19	MULDER	ALBERT H
25	1	B	2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-1	6777			pvt cres v r	Private-Unspecified	
26	1	B	2	1000 ft to 1.5 mi	Res	mobile	1	RES TT-1	6451			pvt cres v r	Private-Unspecified	
27	1	B	2	1000 ft to 1.5 mi	Res	mobile	1	RES TT-2	6482			pvt cres v r	Private-Unspecified	
28	1	C	2	1000 ft to 1.5 mi	Res	fixed	1	RES H-3	7691	T31N R49E SEC 25 N2NW4SW4	EUREKA	005-090-63	HILL	MICHAEL C
29	1	C	2	1000 ft to 1.5 mi	Res	fixed	2	RES H TT	5047	T29N R52E SEC 19	EUREKA	005-580-28	RANKIN	RONALD J AND LINDA P
30	1	C	2	1000 ft to 1.5 mi	Res	mobile	1	RES OW-2	2809	T31N R48E SEC 23 NW4	EUREKA	005-020-03	PANNING	ADELL
31	1	C	2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-5	1894	T31N R48E SECTION 14	EUREKA	005-010-39	BLM	
32	1	D	2	1000 ft to 1.5 mi	Ind	gravel pit	1	BUS AGP	3626		EUREKA	006-040-01	BLM	
33	1	D	2	1000 ft to 1.5 mi	Public		1	BUS REST AREA	3191	T25N R51E POR SEVERAL SECS	EUREKA	006-190-02	BLM	
34	1	E	2	1000 ft to 1.5 mi	Res	fixed	3	RES 3RH-4	1386	SUM PARCEL 007-010-02	WHITE PINE	007-260-04	SILVER STATE RANCHES	
35	1	F	2	1000 ft to 1.5 mi	Res	fixed	1	RES H-5	7785	T23N R52E SEC 18 W2 LOT 12	EUREKA	007-050-17	BERGERON	BURTON AND BARBARA
36	1	F	2	1000 ft to 1.5 mi	Res	fixed	1	RES RH-10	2932	T25N R51E PORTION SECS 34 ANO 35	EUREKA	006-200-06	ETCHEVERRY FAMILY LTO PARTNERSHIP	
37	1	G	2	1000 ft to 1.5 mi	Ind	gravel pit	1	BUS AGP	1059		EUREKA	007-320-05	BLM	
38	1	G	2	1000 ft to 1.5 mi	Res	fixed	2	RES 2RH-3	5385	SUM PARCEL 007-320-01	EUREKA	007-320-01	RISI	R ROY ANO MARY E
39	1	H	1	Within 1000 ft	Com	agric	1	BUS SHOP FOR RANCH	516	T20N R53E SECTION 18 E2	EUREKA	007-330-11	HALPIN	TIM J AND SANDIE L
40	1	H	1	Within 1000 ft	Res	fixed	1	RES RH	539	T20N R53E SECTION 18 E2	EUREKA	007-330-11	HALPIN	TIM J AND SANDIE L
41	1	H	1	Within 1000 ft	Res	fixed/mobile	2	RES H DW-1	486	T20N R63E POR SEVERAL SECS	EUREKA	007-330-01	BLM	
42	1	H	2	1000 ft to 1.5 mi	Com		1	BUS -1	5932	T21N R53E SEC 18 S2SE EAST HWY 278	EUREKA	007-400-07	EUREKA PROOUCERS CO-OP	
43	1	H	2	1000 ft to 1.5 mi	Com	agric	1	BUS RANCH-6	3102	T20N R53E NW4 SECTION 17	EUREKA	007-330-12	ANOERSON	JERRY LEE
44	1	H	2	1000 ft to 1.5 mi	Public		1	BUS CHURCH	7366	T21N R53E SEC 20 NW4NW4NW4	EUREKA	007-210-27	CHURCH OF JESUS CHRIST OF LOS	
45	1	H	2	1000 ft to 1.5 mi	Res	fixed	1	RES H-1	4434	T21N R53E SEC 18 WEST HWY 278	EUREKA	007-400-03	BERGENER	DON L ANO LINDA L
46	1	H	2	1000 ft to 1.5 mi	Res	fixed	1	RES H-3	3083	T21N R53E SEC 18 POR OF	EUREKA	007-400-09	OAMELE	JAMES O ANO GARNETH R
47	1	H	2	1000 ft to 1.5 mi	Res	fixed	1	RES H-3	4345	T21N R53E SEC 18 WEST HWY 278	EUREKA	007-400-13	BUFFINGTON FAMILY TRUST	
48	1	H	2	1000 ft to 1.5 mi	Res	fixed	1	RES H-3	6279	T21N R53E S2 SEC 7	EUREKA	007-200-12	RIGGS	WILLIAM W AND LUHREE G
49	1	H	2	1000 ft to 1.5 mi	Res	fixed	1	RES MOO	4236	T21N R53E SEC 18 WEST HWY 278	EUREKA	007-400-03	BERGENER	OON L ANO LINDA L
50	1	H	2	1000 ft to 1.5 mi	Res	fixed	1	RES RH	3261	T20N R53E SECTION 17 SW4	EUREKA	007-330-14	ANOERSON	JERRY LEE
51	1	H	2	1000 ft to 1.5 mi	Res	fixed	1	RES RH-7	5543	T20N R53E ALL SECTION 20	EUREKA	007-340-04	STINE	OAVIO ANO RAMONA
52	1	H	2	1000 ft to 1.5 mi	Res	mobile	1	RES OW-2	6612	T21N R53E SEC 18 N2SE4	EUREKA	007-400-06	SHUEY	OAVIO M AND CHRISTINE K

CASE_	FREQ	SEGMENTT_C	DIST_ZONE	USE	USE_TYPE	UNITS	DESC	(feet)	LOCATION	COUNTY	APN	L_NAME	F_NAME
53	1	H 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-2	7243	T21N R53E SEC 18 S2SE EAST HWY 278	EUREKA	007-400-07	EUREKA PRODUCERS CO-OP	
54	1	H 2	1000 ft to 1.5 mi	Res	mobile	1	RES SW	4464	T21N R53E SEC 18 POR OF	EUREKA	007-400-12	WILKER	JON R AND RHONDA S
55	1	H 2	1000 ft to 1.5 mi	Res	mobile	1	RES SW	4556	T21N R53E SEC 18 POR OF	EUREKA	007-400-12	WILKER	JON R AND RHONDA S
56	1	H 2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-1	4712	T21N R53E SEC 18 WEST HWY 278	EUREKA	007-400-03	BERGENER	DON L AND LINDA L
57	1	H 2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-2 RANCH	6356	T21N R53E SEC 6 S2 EXCEPT 1.73	EUREKA	007-200-50	BAILEY	FRED AND CAROLYN
58	1	H 2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-3	5805	T21N R53E SEC 18 S2SE EAST HWY 278	EUREKA	007-400-07	EUREKA PRODUCERS CO-OP	
59	1	H 2	1000 ft to 1.5 mi	Res	mobile	2	RES DW SW-2	5772	T21N R53E SEC 18 S2SE EAST HWY 278	EUREKA	007-400-07	EUREKA PRODUCERS CO-OP	
60	1	H 2	1000 ft to 1.5 mi	Res	mobile	55	subdivision (est 55DW)	5831			pvt subd 07-39	Private-Unspecified	
61	1	I 1	Within 1000 ft	Ind	gravel pit	1	BUS AGP	491	T20N R53E POR SEVERAL SECS	EUREKA	007-340-08	BLM	
62	1	I 1	Within 1000 ft	Res	fixed	1	RES RH-4	442	T20N R53E SEC 32 SW4NE4 SE4NW4	EUREKA	007-340-13	MINOLETTI	JOHN B AND NANCY M
63	1	I 1	Within 1000 ft	Res	fixed	1	RES RH-4	803		EUREKA	007-410-01	COLLINGWOOD	REX M AND GERALDINE
64	1	I 1	Within 1000 ft	Res	mobile	1	RES SW-3	675	SUM PARCEL 009-090-06	WHITE PINE	009-090-06	DALY	MARK
65	1	I 2	1000 ft to 1.5 mi	Com		1	BUS -1 PROPANE CO.	6856	PARCEL D FILE #124822	EUREKA	007-370-09	SUBURBAN PROPANE LP	
66	1	I 2	1000 ft to 1.5 mi	Ind	mine-related	1	BUS MINE MILL-4	5163	T19N R53E POR SEVERAL SECS	EUREKA	008-070-02	BLM	
67	1	I 2	1000 ft to 1.5 mi	Ind	mine-related	1	BUS MINE WELL SHOP	7580	T19N R53E POR SEVERAL SECS	EUREKA	008-070-02	BLM	
68	1	I 2	1000 ft to 1.5 mi	Public		1	BUS MISC-BLM-1	4573	T19N R53E SECTION 11 PORTION OF	EUREKA	001-221-04	UNITED STATES OF AMERICA	
69	1	I 2	1000 ft to 1.5 mi	Public		1	BUS MISC-DOG POUND	4924	T19N R53E SEC 11 SE4SE4	EUREKA	001-221-02	EUREKA COUNTY	
70	1	I 2	1000 ft to 1.5 mi	Public		1	BUS MISC-FAIR GRNDS	3625	T19N R53E SEC 11 PORTION OF	EUREKA	001-221-03	EUREKA COUNTY	
71	1	I 2	1000 ft to 1.5 mi	Res	fixed	1	RES RH	3333	SUM PARCEL 009-090-10	WHITE PINE	009-090-10	RAPONE FAMILY TRUST	
72	1	I 2	1000 ft to 1.5 mi	Res	fixed	1	RES RH	5234		WHITE PINE	009-190-01	HIGGINS	LAWRENCE E AND ELIZABETH
73	1	I 2	1000 ft to 1.5 mi	Res	fixed	1	RES RH-1	3129		EUREKA	007-410-04	HOMESTAKE MINING COMPANY OF CA	
74	1	I 2	1000 ft to 1.5 mi	Res	fixed	1	RES RH-2	1862	T20N R53E SEC 30 POR	EUREKA	007-340-22	ROBERT C AND C HERRERA FAMILY TRUST	
75	1	I 2	1000 ft to 1.5 mi	Res	fixed	1	RES RH-3	7618	SUM PARCEL 007-010-02	WHITE PINE	009-090-05	SILVER STATE RANCHES	
76	1	I 2	1000 ft to 1.5 mi	Res	fixed	1	RES RH-7	4006	SUM PARCEL 009-090-10	WHITE PINE	009-090-10	RAPONE FAMILY TRUST	
77	1	I 2	1000 ft to 1.5 mi	Res	fixed/mobile	2	RES RH SW-4	1736	T20N R53E SEC 30 LOTS 5 6 AND POR	EUREKA	007-340-23	GARAVENTA	GARY G AND MELODY I
78	1	I 2	1000 ft to 1.5 mi	Res	fixed/mobile	2	RES RH SW-4	4499	T19N R54E POR SECS 5 AND 6	EUREKA	008-090-01	FIORENZI	LEONARD JOHN
79	1	I 2	1000 ft to 1.5 mi	Res	mobile	1	BUSRES SW-1	7155	PARCEL C FILE #124822	EUREKA	007-370-08	ALLEN	ERNEST L
80	1	I 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-1	6197			999		
81	1	I 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-5	3719	T19N R54E POR SEVERAL SECS	EUREKA	008-090-02	BAUMANN	JAMES E AND VERA L
82	1	I 2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-1	6477	PARCEL D FILE #124822	EUREKA	007-370-09	SUBURBAN PROPANE LP	
83	1	I 2	1000 ft to 1.5 mi	Res	mobile	1	RES TT-1	6336		WHITE PINE	009-190-03	SAVARY	ROSS M AND COLEEN
84	1	I 2	1000 ft to 1.5 mi	Res	mobile	3	BUSRES 3TT-1	7420	PARCEL A FILE #124822	EUREKA	007-370-06	WALTER	NORBERT AND EILEEN
85	1	I 2	1000 ft to 1.5 mi	Res	mobile	8	subdivision (est 8DW)	2163	597 FIRST ST	EUREKA	Multiple APNs	Multiple Names	
86	1	J 1	Within 1000 ft	Ind	gravel pit	1	BUS SHOP AGP	865		WHITE PINE	010-320-03	COOPER AND SONS INC	
87	1	J 1	Within 1000 ft	Res	fixed	1	RES H-1	866		WHITE PINE	010-320-04	GRIFFITH	ALAN D AND ROBIN M
88	1	J 1	Within 1000 ft	Res	fixed/mobile	11	subdivision (est3H 6DW)	80*		WHITE PINE	Multiple APNs	Multiple Names	
89	1	J 2	1000 ft to 1.5 mi	Com		1	BUS MINI STOR-1	5019		WHITE PINE	010-330-04	ZAKULA	STEVE
90	1	J 2	1000 ft to 1.5 mi	Public		1	BUS MISC-PRISON	7215		WHITE PINE	009-260-09	STATE OF NEVADA	
91	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H	1719		WHITE PINE	005-610-18	BELL	FRANK JEFFERY
92	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H	2071		WHITE PINE	005-610-15	HANSEN	FRED M AND THERESA L
93	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H	3205		WHITE PINE	010-800-02	STANDLEY	HAROLD D AND KATHLEEN
94	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-1	3489		WHITE PINE	010-270-20	BLM	
95	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-1	6089		WHITE PINE	010-330-22	KELLY	STANLEY L AND STACEY A
96	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-1	7905		WHITE PINE	010-310-13	BURDICK	WALTER A JR
97	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-2	2000		WHITE PINE	005-610-14	BELL	JIMMY H AND JOAN M
98	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-2	3658		WHITE PINE	010-320-01	SCHUH	GLORIA A ET AL
99	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-3	1796		WHITE PINE	005-620-05	FALGE	RICHARD D AND ANGELA MAY
100	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-3	4845		WHITE PINE	010-330-05	CARLGREN	RONALD W AND TAMMY A
101	1	J 2	1000 ft to 1.5 mi	Res	fixed	1	RES H-4	7287		WHITE PINE	010-310-18	OXBORROW	RONALD
102	1	J 2	1000 ft to 1.5 mi	Res	fixed	2	RES 2H	5912		WHITE PINE	010-330-21	ROSE	ALLEN D AND MAUREEN A
103	1	J 2	1000 ft to 1.5 mi	Res	fixed	2	RES 2H-1	2134		WHITE PINE	010-330-01	HESSELGESSER	F E
104	1	J 2	1000 ft to 1.5 mi	Res	fixed/mobile	110	subdivision (est 30H 80DW)	1060	SUM PARCEL 010-420-06	WHITE PINE	Multiple APNs	Multiple Names	
105	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW	1522		WHITE PINE	010-270-20	BLM	
106	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW -2	2246		WHITE PINE	005-620-07	SANDERS	ERIC M AND MARSHA L
107	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-1	2890		WHITE PINE	005-620-04	BENNETT	JACK L AND LARUE
108	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-1	2900		WHITE PINE	005-620-04	BENNETT	JACK L AND LARUE
109	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-1	3132		WHITE PINE	005-610-13	HANSEN	FRED M AND THERESA L
110	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-1	3329		WHITE PINE	005-610-11	BASS	WILLIAM R AND CAROL A
111	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-1	6890		WHITE PINE	010-330-13	BARTLETT	ROBERT O AND GAYLE
112	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-3	1449		WHITE PINE	005-610-02	RYKOVICH	FRANK AND CAROL
113	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-3	1525		WHITE PINE	005-610-03	ZAMORA	ANTHONY T AND MARILYN G
114	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-3	3333		WHITE PINE	005-610-10	DOLFIN	FRANK W AND TRULY R
115	1	J 2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-4	1445		WHITE PINE	005-610-04	WARD	WILLIAM A ET AL

CASE_	FREQ	SEGMENT	T_C	DIST_ZONE	USE	USE_TYPE	UNITS	DESC	(feet)	LOCATION	COUNTY	APN	L_NAME	F_NAME
116	1	J	2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-5	7473		WHITE PINE	010-310-13	BURDICK	WALTER A JR
117	1	J	2	1000 ft to 1.5 mi	Res	mobile	1	RES DW-6	1697		WHITE PINE	005-620-12	PARKER	CATHIE G
118	1	J	2	1000 ft to 1.5 mi	Res	mobile	1	RES SW+ADD ONS-6	6255		WHITE PINE	010-310-11	OXBORROW	THOMAS E AND SHERRY D
119	1	J	2	1000 ft to 1.5 mi	Res	mobile	1	RES SW-1	3025		WHITE PINE	005-610-12	SPEAR	DONNA AND THAD W
120	1	J	2	1000 ft to 1.5 mi	Res	mobile	2	BUSRES AND DW-6	7022		WHITE PINE	010-330-13	BARTLETT	ROBERT O AND GAYLE

* 80 ft. from edge of subdivision property boundary, 250 ft. from nearest residence

APPENDIX E

RECLAMATION PLAN

RECLAMATION PLAN

E.1 INTRODUCTION

Reclamation refers to activities to restore areas disturbed by project construction to pre-construction conditions. The Reclamation Plan outlines the important elements of revegetation, soil stabilization, and range/wildlife habitat reclamation associated with the project. It defines goals/objectives, implementation components, restoration success criteria, and monitoring and maintenance components. It also identifies potential issues or constraints to reclamation, regulations and recommendations to ensure successful reclamation, and a summary of impacts and mitigation measures contained in various sections of this Draft EIS applicable to reclamation. Other sections referenced here include Section 3.2 Soils, Section 3.4 Vegetation Resources, Section 3.5 Invasive, Non-Native Species, Section 3.6 Wildlife and Wildlife Habitat, Section 3.7 Special Status Species, Section 3.8 Range Resources, and Section 3.10 Public Health and Safety. The elements of the Reclamation Plan will be developed in detail as part of the Construction, Operation, and Maintenance (COM) Plan.

METHODOLOGY

Information on reclamation issues and recommendations for ensuring successful reclamation was obtained from a review of the Great Basin Restoration Initiative (BLM 1999b); the Burned Area Emergency Rehabilitation (BAER) Plan (BLM 1999a); Nevada Guidelines for Revegetation (Nevada State Clearinghouse 1998); Tuscarora Natural Gas Pipeline Project Draft and Final EIR/EIS (Tuscarora 1994, 1995a); Alturas Intertie Project Construction, Operation, and Maintenance (COM) Plan (SPPC 1998); and 1999 Post-Construction Mitigation Monitoring Report for the Alturas Intertie Project (KEA 2000).

Regulations, Plans, and Guidelines

Regulations, plans, and guidelines that apply to reclamation of disturbed areas resulting from the project, and regional issues affecting reclamation planning, include the Great Basin Restoration Initiative, Burn Area Emergency Rehabilitation (BAER) Plan, and the Nevada Guidelines for Revegetation.

The Great Basin Restoration Initiative

The Great Basin Restoration Initiative (BLM 1999b) began in 1999 in response to major landscape changes taking place in the Great Basin. These landscape changes are attributed to major wildland fires in 1999, invasive weed and annual grass invasions, and deteriorating rangeland and wildlife habitat conditions. There is a growing realization of the enormous economic and ecological consequences of these interconnected landscape changes. In response, the Great Basin Restoration Initiative was created to try to restore functioning native plant communities, stabilize watersheds and soils, improve wildlife habitat, improve rangeland quality for wild horses and livestock, reduce invasive weed and annual grassland invasions, protect areas with high-resource values, improve recreational opportunities, and reduce risks and costs of wildland fires. To meet these objectives, long-term restoration has been proposed to break the cycle of increased annual grass invasions (e.g., cheatgrass) and wildland fires by reducing invasive weeds and annual grasses.

Burn Area Emergency Rehabilitation (BAER) Plan

In response to the devastating wildfire season experienced by Nevada in 1999, the BLM requested the Department of Interior to send a Burned Area Emergency Rehabilitation (BAER) Team to help identify, evaluate, and plan the rehabilitation of critical areas within the fire perimeters. The BAER Team includes resource professionals from federal, state, and local agencies, as well as private enterprises, resource groups, and landowners. The BAER plan (BLM 1999a) for the Northern Nevada Fire Complex covers portions of lands managed by BLM's Elko and Battle Mountain Field Offices. The goal of the plan is to

assess rehabilitation needs and make recommendations with regard to vegetation and range resources, invasive weeds, wild horses, soils and watersheds, wildlife, sensitive species, and cultural resources.

Nevada Guidelines for Revegetation

The Nevada Guidelines for Revegetation (Guidelines)(Nevada State Clearinghouse 1998) represent the combined efforts of numerous State of Nevada agencies and the Nevada Seedbank Coordinating Committee, all of whom are involved in land use, transportation, research, and/or natural resource management activities. The Guidelines assist in the preliminary planning process for projects involving revegetation. The purpose of revegetation, supported by the State of Nevada, is to return the land to conditions and productive uses similar to pre-disturbance conditions, or to a desired site-specific plant community. When revegetation selections or practices less preferred by the State of Nevada are proposed for a particular project, the State of Nevada requests that the reasons supporting such choices be detailed in accompanying environmental documentation. The state requests that impacts to existing native vegetation be minimized, topsoil be stockpiled and replaced, and measures be implemented to avoid weed invasions. The guidelines call for use of native or non-persistent exotic plant species in the revegetation process to help promote the long-term maintenance of Nevada's remaining native vegetation, as well as to improve and restore degraded habitat.

Goals and Objectives

The goals of reclamation for project disturbance areas are to: (1) restore plant communities and associated wildlife and range habitat; (2) restore wetland functionality; (3) prevent substantial increases in invasive, non-native species (invasive weeds), including cheatgrass; (4) prevent project-related soil erosion and sedimentation; and (5) restore the visual character of the project area to pre-construction conditions.

To achieve these goals, the Reclamation Plan includes the following objectives:

- Restore temporarily disturbed upland and wetland plant communities and range and wildlife habitat to species composition and vegetation cover similar to those found in adjacent areas undisturbed by project activities.
- Restore wetland topography and hydrology to support wetland functions similar to pre-construction conditions.
- Restore native plant cover and control cheatgrass and other invasive non-native species in areas highly susceptible to invasion, but as yet not dominated by these species.
- Provide greenstripping in cheatgrass-dominated areas disturbed by project activities where it would aid in protecting resources from future wildfires.
- Incorporate construction and reclamation BMPs and revegetation measures to stabilize soils and prevent increased erosion and sedimentation and other potential soil-related problem areas disturbed by project activities.
- Incorporate non-linear (e.g., sinuous) construction pathways, minimization of vegetation removal, or other visual impact minimization measures where feasible.

Responsibilities

SPPC would be responsible for providing the contractor, reclamation team, and post-reclamation monitors with the final Reclamation Plan. The final Reclamation Plan would be included as part of the COM Plan. It would be the responsibility of SPPC to ensure that the contractor, reclamation team, and post-reclamation monitoring teams understand the intent of the final plan and are committed to meeting the plan objectives. SPPC would supply an environmental compliance monitor to ensure adherence to the plan. In addition, BLM will also supply an environmental compliance monitor.

E.2 RECLAMATION CONSTRAINTS AND RECOMMENDATIONS

SOILS

Soil issues related to reclamation include potential impacts resulting from the seven soil constraint groups listed in Table E-1, all of which could reduce the success of reclamation efforts. Two particularly important soil constraints that may affect reclamation are steep slopes and erosion hazard. Areas affected by these two characteristics are discussed in Section 3.2, Soils. Specific construction and reclamation measures and best management practices (BMPs) would be implemented to minimize disturbances in areas with soil constraints in an effort to ensure successful reclamation. These measures and BMPs are summarized in Table E-1 and outlined in Section E.3, Implementation [Construction and Reclamation Protocols].

TABLE E-1: RECLAMATION ISSUES, CONSTRAINTS, AND APPLICABLE MEASURES

Resource	Issue/Constraint	Applicable Measures
Soils	High water erosion hazard – loss of topsoil and sedimentation of downstream resources	• Mitigation Measure Soil-4 • Apply erosion and sediment control BMPs during reclamation
	Steep slopes – insufficient water availability to the root zone and difficult to retain seeds on slope	• Mitigation Measure Soil-4 • Apply erosion control BMPs where needed
	Shallow depth to bedrock – plant rooting depth and available water may be restricted	• Mitigation Measure Soil-2 • Use prescriptive seed mixes containing native species adapted to these soils
	High water table – deep rutting and compaction from equipment	• Mitigation Measure Soil-1
	Course textured soil – poor water retention for seed germination and plant establishment	• Mitigation Measure Soil-2 • Use prescriptive seed mixes containing native species adapted to these soils
	Salinity/alkalinity – low nutrient availability, potential for stunted plant development	• Mitigation Measure Soil-2 • Use prescriptive seed mixes containing native species adapted to saline/alkaline conditions.
	High shrink/swell potential – soil stability and drainage problems	• Mitigation Measure Soil-1 • Mitigation Measure Soil-3 • Use prescriptive seed mixes containing native species adapted to these soils
Vegetation Resources; Wildlife and Wildlife Habitat; Special Status Species; Range Resources	Temporary loss and disturbance of upland plant communities, associated wildlife habitats, and range resources.	• Mitigation Measure Vegetation-1 • Revegetation of plant community types and associated habitat and range resources, using prescriptive seed mixes.
	Temporary loss of riparian and wetland communities.	• Mitigation Measures Vegetation-6A-6C • Revegetation of riparian and wetland communities and associated habitat using prescriptive seed mixes.
Invasive Weeds	Introduction and dispersal of invasive weeds during any phase of construction, operations, and maintenance	• Mitigation Measures Vegetation-4 • Mitigation Measure Invasive Weeds-1 • Revegetation of native plant community types, but including use of competitive non-native, non-invasive plants (e.g., crested wheatgrass) in prescribed seed mixes in areas that are highly infested or highly susceptible to infestation.
	Potential for increased cheatgrass invasion in project disturbance areas.	• Revegetation of native plant community types and greenstripping, including use of competitive non-native, non-invasive plants (e.g., crested wheatgrass) in prescribed seed mixes in fire-prone areas that are highly infested with cheatgrass or highly susceptible to infestation by cheatgrass.

Resource	Issue/Constraint	Applicable Measures
Reclamation	Potential damage to revegetated areas during plant establishment phase by livestock grazing or through public access	• Placement of barriers/fencing or other means to temporarily block access and exclude grazing to sensitive revegetation areas, including compensation for grazing exclusion on private lands.

VEGETATION RESOURCES, WILDLIFE AND WILDLIFE HABITAT, AND RANGE RESOURCES

Reclamation issues include restoration of upland, wetland, and riparian plant communities and associated wildlife habitats. Vegetation and associated range and wildlife habitat issues and recommendations are described below and summarized in Table E-1. Revegetation protocols are outlined under Section E.3, Implementation.

Restoration of Upland Plant Communities and Associated Wildlife and Range Habitats

To ensure that wildlife and range habitat values are restored, seed prescriptions would be developed based on the plant species composition, species dominance, and habitat characteristics of the native plant community that would be disturbed by project activities. Plant community types and associated wildlife and range habitats are discussed in Section 3.4, Vegetation Resources; Section 3.6, Wildlife and Wildlife Habitat; and Section 3.8, Range Resources. Seed mixes and revegetation strategies for upland plant communities would be modified based on soil constraints and the likelihood of increased invasion by cheatgrass and spread of invasive weeds. The selection of seed mix prescriptions for plant community types is discussed in Section E.3, Implementation.

Wetlands and Riparian Communities

Special issues or concerns with wetlands and riparian communities include unique soils, hydrophytic vegetation, soil compaction, and hydrologic conditions that could be affected by project activities, thus hindering success in restoring wetlands to pre-construction conditions. Potential impacts to wetlands and riparian areas and the mitigation measures to reduce them are described in Section 3.4, Vegetation Resources. Hydrology, topography, topsoil, and vegetation would be restored during reclamation of wetland and riparian areas temporarily disturbed by construction activities.

Based on post-construction assessment of revegetation activities for the Tuscarora Pipeline Project and Alturas Intertie Project (KEA 2000), high vegetation cover and species richness were reestablished when hydrology and topography were restored following construction. Seed mixes and revegetation strategies for wetland and riparian communities would be modified based on soil constraints and the likelihood of invasion or spread of invasive weeds. The selection of seed mix prescriptions for plant community types is discussed in Section E.3, Implementation.

INVASIVE WEEDS

To prevent the introduction and dispersal of invasive weeds, proper seed mixes and construction, reclamation, and post-reclamation weed management practices will be implemented. Also, revegetation will be implemented as quickly as possible following construction. Invasive weed issues and mitigation measures are described in Section 3.5, Invasive, Non-native Species, and control measures are outlined in Section E-3, Implementation [Weed Abatement Plan]. The goal would be to prevent and minimize population increases or the spread of invasive weeds resulting from this project. Invasive weeds issues and recommendations are summarized later in this plan.

Cheatgrass

The frequency of wildfires in the Great Basin has increased substantially, largely as a result of the invasion by cheatgrass throughout the region. Once cheatgrass dominates an area, it is unlikely to be restored to the natural plant community due to the recurrence of wildfires. Wildfires are a natural component of the Great Basin ecosystem; however, increased wildfires can result in losses of wildlife and range habitat. The goal is to prevent increases in the potential for wildfires resulting from project disturbances and to assist in lowering the potential for wildfires where resources need protection.

To lower the likelihood of wildfires, areas disturbed by project construction which are highly susceptible to cheatgrass invasion would be monitored and treated during the reclamation process. In general, highly susceptible areas include native vegetation communities that have recently burned, those that are near to heavily infested areas, and those that are characterized by soil types (e.g., Tenabo series) which are frequently dominated by cheatgrass. Areas currently dominated by cheatgrass may, in some cases, be revegetated with greenstrips to assist in preventing wildfire spread and enable access for firefighting crews during fires.

E.3 IMPLEMENTATION

To facilitate post-construction reclamation, the contractor would adhere to the following guidelines.

CONSTRUCTION AND RECLAMATION PROTOCOLS

Site Preparation

Site preparation would be implemented by the construction contractor, concurrent with (e.g., topsoil salvage), and subsequent to (e.g., regrading) transmission line construction. Site preparation involves the removal of obstacles (e.g., large rocks, trees, brush) to provide sufficient area for construction activities. Areas cleared of obstacles would not necessarily be subject to grading. Site preparation would be limited to the area required to facilitate access to reclamation areas and implement reclamation. Site preparation would comply with all relevant mitigation measures in the EIS.

Topsoil Salvage, Storage, and Replacement

Topsoil on sites subject to temporary disturbance would be salvaged and replaced after project construction to enhance revegetation. Low shrubs and herbaceous plants would be salvaged along with topsoil to increase organic matter and decrease the potential for wind and water erosion. Topsoil would only be removed from areas that require blading and excavation.

After the transmission line construction corridor has been regraded and any subsoil compaction in the work areas has been alleviated, topsoil would be replaced in those areas from which it was stripped. Topsoil would not be mixed with subsoil or spoil material before or during replacement, and only topsoil and any salvaged organic matter would be respread over the surface.

Recontouring/Regrading

All construction areas would be recontoured to approximate pre-construction grades with allowances for settling.

Treatment of Soil Compaction

Some of the soils within the project area have a high clay content. Compaction would be minimized by implementing Mitigation Measure Soil-1. Areas determined to be compacted (i.e., to a degree which contributes to erosion, or impedes water infiltration or reclamation success) would be treated following

construction. Soil compaction would be avoided by using a chisel, plow, disc, or other equipment. Compacted soils would not be treated if it is determined that the treatment would do more harm than good. Areas to be treated would be determined by a qualified reclamation ecologist and soil specialist.

Erosion Control

Measures to minimize the potential for soil erosion due to project construction activities would be implemented in all project areas. These measures are detailed in Section 3.2, Soils.

Additionally, non-standard construction equipment and techniques (e.g., balloon-tire vehicles, geotextile cushions) that minimize surface disturbance, soil compaction, and topsoil loss would be implemented in areas of highly erodible soils.

The re-establishment of vegetation would be implemented as quickly as possible after construction to reduce the erodibility of soils in these areas.

Rock Disposal

Rocks would be disposed of in a manner that would not interfere with natural drainage patterns or the movement of wildlife or livestock. In rangeland areas, rock would be distributed over the disturbed area after project construction. Rock displaced by grading would be redistributed within the project area as agreed to by the land management agency or landowner or hauled away to an approved rock disposal storage site. Large rocks (boulders) may be placed for use as access control structures.

REVEGETATION PLAN

The project proponent would be responsible for revegetating areas subject to temporary impacts caused by project construction. To meet these reclamation objectives, the Revegetation Plan is designed to promote re-establishment of vegetation similar in composition and species richness to preconstruction conditions.

SPCC's approach to revegetation emphasizes conservation and enhancement of native vegetation, supplemental seeding, and control of invasive weeds and erosion. Disturbed areas to be seeded following construction would be determined by a qualified reclamation ecologist and appropriate resource specialists (i.e., soils, wildlife, visual, weeds) based on site sensitivity (e.g., erodibility, susceptibility to weeds, importance to sensitive wildlife) and low likelihood to restore naturally. SPCC does not intend to transplant or plant container stock.

Seed Collection Program

Native seed would be locally collected for revegetation while ensuring that seed source plant populations would not be adversely affected. Any seed material to be salvaged from areas subject to vegetation removal would be conducted prior to construction activities. BLM uses locally collected seed in their revegetation programs and issues permits and contracts to commercial collectors for seed collection on BLM-managed lands.

Species Selection and Seed Mixes

Descriptions of plant communities mapped during preconstruction field surveys, including plant species composition, are provided in Section 3.4, Vegetation Resources. Seed mixes would be included in the COM Plan, following coordination with BLM and NDOW.

Combinations of the following key elements would guide the development of site-specific species mixes, depending on objectives (e.g., erosion control, wildlife habitat reclamation) and site conditions (e.g., soil type, water availability):

- The distribution and density of native plant species in the plant communities and areas subject to project disturbance;
- Native plant species with high wildlife habitat value;
- Native and non-invasive, non-persistent, non-native plant species which control erosion;
- Plants adapted to additional soil constraints (e.g., high alkalinity, hydric soil);
- Native and non-invasive, non-persistent, non-native plant species which compete with cheatgrass and other invasive weeds;
- Species which enhance natural patterns of plant community re-establishment;
- Plant species likely to become established from seed in disturbed areas (i.e., it is better to use species that are known to have high germination rates and a demonstrated ability to colonize disturbed areas); and
- Availability of commercially and locally collected seeds.

Plant species would be selected using information from the following sources:

- Floristic inventory of plants found in the study area, including those listed in the Vegetation Survey Report (SEI 2000)
- Plant community descriptions (see Section 3.4, Vegetation Resources)
- BLM recommended reclamation seed mixes
- Alturas Intertie Project COM Plan seed mixes (SPPC 1998)
- Valmy to Falcon 345 kV Power Line COM Plan (EDAW 1994)
- Tuscarora Natural Gas Pipeline Project Reclamation Plan (Tuscarora Natural Gas Transmission Company 1995b)
- VegSpec: a multi-agency, web-based decision support system, maintained by NRCS, that assists land managers in the planning and design of vegetative establishment practices, based on specific site information (e.g., soils series) and site objectives. (The web address is: http://www2.nrcs.usda.gov/Netdynamics/Vegspec/pages/HomeVegspec.htm)

Seedbed Preparation

On slopes less than 15% where graded areas would be returned to their preconstruction condition, the seedbed would be disced, harrowed, and/or otherwise treated, as needed, to reduce compaction, break up large soil clods, and add texture to the surface to reduce runoff and create microsites for seed germination. Where slopes exceed 15% and in areas with extremely rocky soils, the soil surface would be left in roughened condition to create an irregular seedbed to provide microsites for seed germination and minimize soil movement and runoff.

Sowing Seed

To maximize germination success, seeding would be conducted through a combination of drill and broadcast, appropriate to species planted and site conditions (e.g., grasses and forbs may be drilled or otherwise mixed into soil; sagebrush and other scrub seeds would be broadcast by seed dribbling or other methods). Additional seeding techniques (e.g., hydroseeding) would be used, as needed, in areas with adverse conditions (e.g., wind erosion).

Seeding Schedule

The seeding schedule would be refined in response to weather, site conditions, and the construction schedule. Seeding would be coordinated with other reclamation activities and would occur as soon as possible after final grading, if weather conditions and the season are suitable. Steep slopes and areas adjacent to perennial or intermittent streams would be seeded immediately after final grading (weather permitting) along with erosion control measures detailed in Section 3.2.

SENSITIVE RESOURCES

Wetland and Riparian Communities

Specific revegetation and protection protocols shall be developed and detailed in the COM Plan for wetland and riparian areas. Protocols shall include seed mixes and sowing protocols specific to riparian and wetland communities, as well as specific protocols for post-seeding weed control, access, and grazing. The protocols shall include Mitigation Measures Soil-1, Vegetation-4 and -5, and Invasive, Non-native Species-1.

Prior to construction, riparian and wetland areas that are avoidable would be identified and clearly marked to avoid disturbance. Unavoidable riparian and wetland areas would be documented and photographed as part of pre-construction monitoring.

WEED ABATEMENT PLAN

The Weed Abatement Plan outlines prevention and control measures for invasive weeds which could spread as a result of project activities. Invasive weeds identified during project site surveys included hoary cress (*Cardaria draba*), also known as low whitetop, and tall whitetop (*Lepidium latifolium*), also known as perennial pepperweed. Cheatgrass is also prevalent in the project area and is discussed below. Control measures would also be included for all additional invasive weeds identified prior to or during project construction and reclamation.

SPPC shall control invasive weeds occurring in the project area as a result of project construction until both revegetation and weed abatement criteria have been met. SPPC shall additionally reseed substantial-sized (e.g., greater than 0.5 acre) areas disturbed during operations and maintenance activities which are at risk to weed invasion.

Table E-2 summarizes the ecology and preferred treatment methods and dates for invasive weeds found in the project area during surveys. Site-specific cheatgrass control and revegetation protocols shall be included in the COM Plan for reclamation of highly susceptible areas. All treatments must be approved for use by the landowner and be conducted in compliance with state and local weed control regulations. All herbicides must be applied by qualified, licensed personnel and used in accordance with label directions. To minimize further disturbance, treatments will be conducted in conjunction with weed surveys to the extent possible.

The University of Nevada Cooperative Extension publishes up-to-date information on the identification and control of weeds, and contains accepted treatment protocols for other common invasive weeds that could occur but thus far have not been observed in the study area. These invasive weeds could become problems at some point in the future. Comparative treatment strategies for the control of tall whitetop are detailed in Biology and Control of Perennial Pepperweed (Renz and Di Tomaso 1999).

SPPC would be responsible for the control of invasive weeds occurring in areas disturbed during construction within the 500-foot wide study corridor, around the substations, and along access roads used solely or primarily for project operation and maintenance, until both revegetation and weed

abatement criteria have been met. SPPC would not be responsible for pre-existing weed infestations, weeds introduced by another activity (e.g., other construction project, mining, ranching, hunting, etc.), or natural occurrence (e.g., fire); weeds found beyond the right-of-way; or weeds along existing access roads, which are not improved by the project.

TABLE E-2: ECOLOGY AND CONTROL OF INVASIVE WEEDS*

Weed	Preferred Treatment	Treatment Dates	Monitoring and Retreatment Dates
Hoary Cress	Apply a site-appropriate herbicide (i.e., in accordance with label) during early growth to "broccoli head" stage (Donaldson and Bowers 1998). Follow by planting of competitive vegetation following completion of construction activities. Repeated cultivation may be used in areas with low erosion risk away from water channels (Donaldson and Bowers 1998).	Late winter to early spring, based on growth stage. Cultivate every 21 days beginning in early spring, until no additional seedlings appear.	Monitor 21 days following treatment. Mow or cut any growing plants, especially if flowers are present. Every 21 days until weed abatement criteria are met (see Section E-4 [Weed Monitoring Plan]).
Tall Whitetop/ Perennial Pepperweed	Mow or cut when flowers reach the bud stage. Follow with a site-appropriate herbicide (i.e., in accordance with label) one month later (Renz and Di Tomaso 1999). Cover treated site with straw or other barrier, if possible, to prevent seed spread. Follow with competitive vegetation following completion of construction activities.	Mow late spring to early summer when flowers are in bud stage. Herbicide one month later.	Monitor one month following complete treatment. Repeat treatment in following year, if needed, using spot treatments to avoid injury to any planted vegetation.

* Invasive weed infestations to be controlled include those that cannot be avoided during construction activities. See the following paragraph for information on control of cheatgrass.

Cheatgrass

Site-specific cheatgrass control and revegetation protocols shall be included in the COM Plan for reclamation of highly susceptible areas (i.e., native plant communities which recently burned, are near dense cheatgrass infestations, or are on soil types which are often dominated by cheatgrass), and cheatgrass-dominated areas to be selected for greenstripping. The prescribed seed mixes for greenstrips and areas highly susceptible to cheatgrass invasion would include, where necessary, the use of competitive non-native, non-invasive plants (e.g., crested wheatgrass) to compete with cheatgrass. Greenstrip locations would not be placed in all cheatgrass-infested areas. They would be chosen based on the likelihood of effectively suppressing fires and protecting resources from future wildfires and cheatgrass infestations. Areas proposed for greenstripping would be determined in cooperation with BLM, NDOW, and the Nevada Department of Forestry.

See Section E-4 for details on weed monitoring and Mitigation Measure Invasive Weeds-1i for details on abatement success criteria and weed monitoring.

RECLAMATION MANAGEMENT

Grazing

Livestock would be temporarily removed from work areas during transmission line construction as needed to avoid interference with construction activities. Additionally, modification of livestock grazing practices may be required to facilitate post-construction reclamation, soil stabilization, and revegetation of areas disturbed by the project. Grazing modifications may be required in areas of habitually high livestock concentration and/or sensitive sites (e.g., erodible soils, wetlands).

Grazing by livestock and/or wild horses has the potential to retard or preclude revegetation of areas disturbed by the project. In sensitive areas, such as wetlands or where livestock concentrate, grazing impacts, if not modified, could prevent reclamation of plant communities disturbed by the project. Areas with reclamation problems resulting from grazing would be protected by management methods feasible for the site. Such methods may include temporary fencing around the site, shifting livestock to other areas, or other methods. Sensitive areas would be protected to the extent feasible where reclamation problems are anticipated, along with unanticipated problem areas that may need remedial reclamation work due to grazing impacts.

Prior to construction, SPPC would work with public agency personnel, allotment permittees, and private livestock operators to identify any authorized range improvements crossed by the project. Alternative water sources would be made available during the period of disruption by project operations if deemed necessary by the responsible public agency or the private landowner. If required, compensation (e.g., based on losses of Animal Unit Months - AUMs) would be provided to private landowners for temporary grazing exclusions that result in grazing losses. SPPC would ensure that construction-affected public and private land range improvements are protected or repaired.

Fencing and Access Control

Livestock and wildlife management fencing would be protected and/or reconstructed in consultation with the managing agency or private landowner. Existing barriers (i.e., fences and gates) to vehicle travel would be maintained during construction and new barriers would be placed to block access areas. Reclaimed access roads and routes would be monitored during post-construction monitoring of areas disturbed by construction. Efforts to control unauthorized use of the ROW would be coordinated with land management agencies and landowners and would be conducted during post construction reclamation monitoring. Methods to control such use may include the following:

- Installation of gates (with or without locks) with fencing extending a reasonable distance to prevent bypassing the gate, especially where fences can be extended to a natural barrier such as an impassable draw or rock outcrop.
- Placing rocks (boulders) at selected sites to inhibit unauthorized vehicle access.
- Installation of slash and timber, pipe, or rock barriers to limit unauthorized access.
- Posting of signs at points of access along the ROW.

E.4 RESTORATION SUCCESS CRITERIA, MONITORING, AND REMEDIATION

RESTORATION SUCCESS CRITERIA

Restoration success criteria are defined as factors to evaluate the success of the reclamation goals and objectives. Criteria to evaluate post-construction revegetation, effectiveness of erosion control measures, and control of cheatgrass and other invasive weeds are outlined in this plan and would be included in more detail in the COM Plan.

Erosion

The effectiveness of erosion control measures would be evaluated by noting particular site conditions, including soil movement and downslope sedimentation, surface litter movement, flow pattern development, rills and gullies, wind-scour depressions, and plant root system exposure.

If the conditions listed are present, it would be assumed that project-related erosion is occurring, and options for remedial measures would be evaluated and implemented as needed. Details on appropriate

erosion control measures are outlined in Section 3.2, Soils and will be presented in more detail in the COM Plan. Erosion control measures would be considered successful when no project-related erosion is evident 5 years following project implementation and when revegetation is considered successful.

Revegetation of Plant Communities and Associated Range and Wildlife Habitat

Revegetation success would be evaluated by comparing project-affected sites with pre-construction conditions and/or adjacent areas in terms of species composition and vegetation cover. The revegetation of sites would be considered successful if they are within a specified percentage of the mean native species composition and vegetation cover of the reference site(s). The reference sites would be either the project-affected site as recorded during pre-construction conditions (if known) or representative areas which have the same target plant community adjacent to the affected site. Preliminary success criteria for species composition are 80% or higher of the mean number and type of native species as in the reference sites and 50% or higher of the vegetation cover of the reference sites, 5 years after implementation of reclamation actions. Wetland areas would have an additional criterion: at least 50% of the vegetation cover should consist of wetland indicator species (i.e., those with a wetland indicator status of OBL, FACW, or FAC (excluding FAC-) as indicated on the national wetland plant list (Reed 1988).

In addition to success criteria, revegetation performance would be evaluated in each year following seeding to ensure successful germination and survival of seedlings. The yearly weather pattern in the Great Basin is unpredictable, and conditions in any given year are often poor for germination. It may take as many as 3 years of seeding to ensure successful germination in some areas. Germination success depends partly on which species are seeded. Criteria for germination success would be included in the COM Plan.

Invasive Weeds

Weed management would be considered successful if existing invasive weed infestations in areas disturbed by construction were no greater in density and extent one year following construction than they were when last monitored prior to construction, and when revegetation criteria were met. SPPC would not be responsible for controlling infestations without a true cooperative effort by surrounding land owners.

In areas where cheatgrass control is required, successful control would be evaluated along with revegetation success. Control would be considered successful when cheatgrass cover is within the range of cheatgrass cover in reference sites (see Revegetation, above) and revegetation criteria were met. Greenstripped areas within sites already heavily infested with cheatgrass would not be required to meet success criteria unless they were used to protect sensitive wildlife or other resources as a required mitigation measure.

Wetlands and Waters of the U.S.

Wetland reclamation would be considered successful if wetland topography and hydrology were within the range of conditions (e.g., gradient, soil profile, surface flow and infiltration patterns) exhibited in reference sites (see Revegetation above), so as to support wetland functions similar to pre-construction conditions.

MONITORING

Monitoring would consist of both qualitative and quantitative analyses. Monitoring would be conducted annually beginning just prior to construction, to establish baseline conditions in sensitive areas (e.g., wetlands). Post-construction monitoring would continue following reclamation until success criteria were met. If post-construction monitoring results indicated that project-affected sites were trending toward successfully meeting soil, vegetation, invasive weeds, and other criteria, monitoring may be

conducted less frequently (e.g., every 2 or 3 years) subsequently, until success criteria were met. Objectives of monitoring may include the following:

- Qualitatively describe the status of revegetation in areas disturbed by the project.
- Qualitatively survey areas disturbed to identify and remedy areas experiencing revegetation failure.
- Document and map areas where revegetation is not progressing in a desired direction, assess the severity of the problems.
- Quantitatively sample and evaluate representative reclamation areas and reference sites (see Revegetation above) to determine whether or not success criteria are met or whether remedial measures are necessary.

Weed Monitoring Plan

Monitoring of invasive weed populations would be conducted annually until both revegetation and weed abatement success criteria have been met. Weed surveys may be conducted less frequently (e.g., every 2 or 3 years) if survey results indicate weed abatement criteria are met, and will continue until revegetation criteria have been met. The monitoring would be conducted during the growing season for most weeds, between late May and mid-July. Lists of weeds to be included in the invasive weed survey would be obtained from the BLM Field Offices and the Nevada Cooperative Extension. Additional information on invasive weed species' habitat requirements, blooming periods, and field identifying characteristics may be obtained from information provided by the Nevada Cooperative Extension, Integrated Pest Management Office, and other references, including Invasive Plants in Nevada: An Identification Handbook (Stoddard et al. 1992), Weeds of the West (Whitson 1992), Weed Identification and Control Guide (Donaldson and Bowers 1998), Noxious Weeds of Central Nevada (BLM 1999), The Grower's Weed Identification Handbook (University of California Undated), and The Jepson Manual (Hickman 1993).

New hoary cress infestations, if any, would be visible in late winter to early spring and would be expected to spread to moist areas (e.g., moist meadows, roadside ditches) and waterways (e.g., ditch banks) in the project area. New cheatgrass infestations would be visible in spring through early summer and would be expected to spread to highly susceptible sites as described in Section E.2 (Invasive Weeds). Tall whitetop infestations would be visible in late winter through summer and would be expected to spread to moist areas similar to hoary cress.

Surveys would be conducted in areas disturbed during construction on foot and/or by vehicle within the 500-foot study corridor, along spur roads and improved and/or reclaimed access roads, and material yard and staging areas. Species names and locations of weed infestations would be mapped (e.g., on USGS 7.5-minute quadrangle maps, or aerial photographs, and/or using a global positioning system [GPS]) and transferred to an updateable GIS database. Photographs would be taken of treated populations prior to treatments and one year following treatments. Infestations would be included on the maps at the following levels:

- Satellite Populations (i.e., possible new colonies) - Defined as very small infestation areas (less than 25 square feet) which have only a few individual plants and are found apart from dense or large weed populations.
- Infestation Sites – Defined as a site in which a minimum of 25 square feet is populated by a weed species. Densities of these weed populations would be estimated as high (i.e., >50 plants), medium (i.e., 10-50 plants), or low (i.e., <10 plants), based on the average number of plants per 25 square feet. Densities can be defined differently for different weed species, as appropriate. All density definitions should be provided on the field monitoring sheets.

REMEDIATION AND ADAPTIVE MANAGEMENT PROCESS

If evaluation of monitoring results indicates that sites disturbed through project activities have not met, or are not trending toward meeting, reclamation criteria, the erosion control, revegetation, or invasive weed control plans may need to be revised (e.g., schedule, seed mixes, treatments, preparation methods). Remedial measures would be implemented as soon as practicable in any problem site identified during monitoring. Remedial measures would be selected on a case-by-case basis and may include measures such as supplemental seeding, mulching, additional weed control measures, use of matting, or other erosion control measures. Remedial measures would be subject to agency approval.

REFERENCES

BLM (Bureau of Land Management). 1999a. Burned Area Emergency Rehabilitation (BAER) Plan.

BLM. 1999b. Great Basin Restoration Initiative.

EDAW, Inc. 1994. Construction, Operation, and Maintenance Plan for the Valmy to Falcon 345 kV Power Line and Associated 120 kV Power Lines Project. Prepared for Sierra Pacific Power Company. May.

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Nevada State Clearinghouse. 1998. Nevada Guidelines for Revegetation. Department of Administration, Budget and Planning Division. Carson City. July 1. http://www.state.nv.us/nvhp/reveg.htm.

Ree, P.B., Jr. 1988. National list of plant species that occur in wetlands: Intermountain (Region 8). U.S. Fish and Wildlife Service. Washington, DC.

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Tuscarora Natural Gas Pipeline Project. 1994. Environmental Impact Report/Environmental Impact Statement Volume 2, Appendices. Prepared for the Federal Energy Regulatory Commission and the California State Lands Commission. FERC/EIS-0078D. Docket No. CP 93-685-000. State Clearinghouse No. SCH93112055. December.

Tuscarora Natural Gas Pipeline Project. 1995a. Environmental Impact Report/Environmental Impact Statement Volumes 1 & 2. Prepared for the Federal Energy Regulatory Commission and the California State Lands Commission. FERC/EIS-0078F. Docket No. CP 93-685-000. State Clearinghouse No. SCH93112055. April.

Tuscarora Natural Gas Transmission Company. 1995b. Environmental Mitigation and Reclamation Plan. Nevada. May. Pipeline Project.

APPENDIX F

PRELIMINARY FIRE PREVENTION AND SUPPRESSION PLAN

APPENDIX F: PRELIMINARY FIRE PREVENTION AND SUPPRESSION PLAN

This appendix presents a preliminary outline of the Fire Prevention and Response Plan that will be further developed in the Construction, Operation and Maintenance (COM) Plan for the Falcon to Gonder project. The purpose of this plan is to outline responsibilities, notification procedures, fire prevention measures, activity-related precautions, fire prevention and suppression equipment, post-fire rehabilitation strategies, and fire suppression contacts related to fire prevention and suppression needs of the proposed project. The goal is to minimize the risk of project-related fires and, in case of fire, provide for immediate suppression within the construction area.

Fire Management Regulations

This project would be subject to state, county, and federally-enforced laws, ordinances, rules, and regulations which pertain to prevention and suppression of fire activities.

Plans Related to the Fire Prevention and Suppression Plan

Blasting Plan: SPPC anticipates that blasting activities will be required for excavation of the 345 kV power line tower holes. A Blasting Plan will be prepared and will address the applicable regulations and environmental mitigation measures to minimize the risks and impacts associated with the storage and use of explosive materials during construction activities.

Responsibilities

Bureau of Land Management

- The BLM Authorized Officer will be responsible for all fire control activities in his/her administrative unit. The Authorized Officer will discuss fire protection stipulations with SPPC's Project Representative concerning action to be taken and will notify the Project Representative when fire conditions warrant implementation of changes in fire plans.
- The BLM Authorized Officer will designate a Compliance Inspector as his/her on-site representative.

SPPC

SPPC should define minimum fire protection requirements, including training for fighting fires, for all construction contractors. SPPC would be responsible for any fires started by their employees and/or contractors in or out of the project area during construction of the proposed transmission line. SPPC would reimburse government agencies for suppression and rehabilitation costs related to these fires. SPPC would be responsible for and implement the following action plan commensurate to the extent needed.

- Initiate and implement all fire control activities on the project until relieved by the BLM Compliance Inspector.
- Comply with state, county, federal laws, ordinances, rules, and regulations which pertain to prevention and suppression of fire activities.
- SPPC's Project Representative would accompany the BLM Compliance Inspector on fire inspections and take corrective action when notified that fire protection requirements are not in compliance.
- Notify contractor to stop all construction activities or to reduce operations, which pose a fire hazard until appropriate safeguards are taken.

- Immediately alert the available project crews when a fire occurs within the project area. The project tools, equipment, and manpower would be sent immediately to control the fire.

Construction Contractor's Designated Fire Marshall

As required in SPPC's construction contract, the Contractor's designated Fire Marshall would be responsible for, but not limited to, the following:

- Conduct regular inspections of all tools and equipment and first aid kits for completeness and compliance with the requirements of this plan.
- Conduct regular inspections of storage and handling of flammable fuels to confirm compliance with applicable laws and regulations.
- Post smoking and fire rules at centrally visible locations.
- Coordinate initial response to fires within the project areas.
- Accompany the BLM Compliance Inspector or the designated representative on fire inspections of the project areas.
- Keep the BLM Compliance Inspector informed of all burning activities.
- Ensure that all SPPC and contract employees are aware of the contents of the Fire Hazard Protection Plan.
- Remain on duty in the immediate area of construction whenever any construction activity is in progress and any additional periods where fire safety is an issue.
- Report all wildfires in accordance with the Notification procedures described below.
- Assume supervision of fire suppression activities until relieved by the BLM Compliance Inspector or other federal, state, or county fire suppression agencies.

Notification

SPPC's Project Representative or General Foreman would immediately notify the BLM Compliance Inspector and the BLM's Battle Mountain, Elko, or Ely Fire Management Officers (see following List of Fire Suppression Contacts) of any project-related fire during construction, operation, or maintenance activities, its location, and the corrective action taken. Following verbal notification, Project Representative would provide written documentation.

Fire Prevention Measures

The following fire prevention measures would be implemented at all times during construction and operation of the proposed project.

- No smoking while operating equipment or while walking or working in areas with vegetation.
- Smoke only in cleared areas.
- Completely extinguish all burning tobacco and matches and discard them in ash trays, not on the ground.
- Do not allow any fires without a burning permit (regardless of the season).
- Ensure that all fires are completely extinguished and cover ash with mineral soil before leaving area unattended.
- Take additional safeguards when fire danger is high.
- Train all personnel in emergency response for fire events.

- Clear away all flammable material (for a minimum of ten feet), including snags from areas of operation where a spark, fire, or flame could be generated.
- Do not allow lunch or warming fires or barbecue grills.

Federally-enforced fire restrictions would also be followed.

Activity-Related Precautions

Burning

SPPC and/or the contractor would obtain permits for burning activities regardless of the season or conditions. SPPC and/or the contractor would include in the permit application any special provisions pertinent to the particular job, including specific on-site fuels and weather data to the permitting authority to determine if the conditions are acceptable with the prescriptions. Special provisions would include activities such as ROW clearing and cleanup, including trash and debris. SPPC or the contractor would conduct and monitor all burning operations and their vehicles would be equipped with the fire suppression equipment. Burning permits would be suspended when special burning restrictions are imposed due to air quality or weather. SPPC or the contractor would notify the BLM Compliance Inspector prior to a burning event.

Blasting

No blasting would be performed without the notification of the contractor's Environmental Coordinator. Blasting operations would follow the requirements described in the Blasting Plan, which would be part of the COM Plan. Blasting activities would only be allowed in areas where vegetation is cleared a minimum of 10 feet around the blasting site. SPPC and contract vehicles at blasting sites would be equipped with the fire suppression equipment.

Welding

SPPC's Project Representative would approve any welding or cutting of power line structures or their component parts. Approved welding or cutting activities would only be performed in areas cleared of vegetation a minimum of 10 feet around the area. Welder vehicles would be equipped with the fire suppression equipment.

Spark Arresters

All internal combustion engines, stationary and mobile, would be equipped with approved spark arresters maintained in good working order. A BLM fire prevention officer would be fully authorized to inspect spark arresters on project equipment prior to its use. Light trucks and cars with factory-installed (type) mufflers, in good condition, may be used on roads cleared of all vegetation with no additional equipment required. Vehicles equipped with catalytic converters are potential fire hazards and would be parked on cleared areas.

Smoking

Smoking and fire rules would be conveyed to the contractor and all field personnel. Smoking would be prohibited during the fire season except in areas designated by BLM. Smoking would be prohibited while operating equipment or while walking or working in areas with vegetation.

Warning Devices

The use of torches, fuses, highway flares, or other devices with open flames would be prohibited. SPPC and all contractors would use only electric or battery-operated warning devices within the project area.

Parking and Vehicle Storage Areas

Equipment parking areas and small stationary engine sites would be cleared of all extraneous flammable materials. Gas and oil storage areas would be cleared of extraneous flammable material and "NO

SMOKING" signs would be posted throughout the area at all times. All used and discarded oil, oil filters, oily rags, or other waste would be disposed of in an approved sanitary landfill. Glass jugs or bottles would not be used as containers for gasoline or other flammable materials.

Equipment Refueling
All fuel trucks would have a 35-pound (minimum) fire extinguisher charged with necessary chemicals to control electrical and gas fires.

Signage
Smoking signs and fire rules would be posted and visible to all SPPC and contract employees during the fire season.

Access
SPPC would provide continuous access to all roads for emergency vehicles during construction.

Minimum Fire Prevention Equipment Required

The following list of fire prevention equipment would be maintained at all times during construction of the proposed transmission line:

- Power saws must be equipped with an approved spark arrester and accompanied by an approved fire extinguisher not less than eight ounces and a long handled, round point, size zero shovel (38 inches minimum). Spark arresters must be maintained in good working order.
- Radio and/or cellular phone communication to reach the closest fire suppression agency.
- Burning permits for all fires.

Minimum Fire Suppression Equipment Required

The following list of fire suppression equipment would be maintained at all times during construction of the proposed transmission line:

- Fire suppression personnel and equipment, including water tenders, would be dispatched within 15 minutes from the time that a fire is reported.
- Fire extinguishers on refueling-fuel service trucks charged with the necessary chemical to control electrical and gas fires with a minimum size 35 pounds capacity with 40 B.C. or higher rating.
- Backpumps filled with water (two at each wood cutting site, one at each welding site, and two at each tower installation or construction site, or any activity site at risk of igniting fires).
- All motorized vehicles and equipment would have one long-handled, round point, size zero shovel (38 inch minimum), one ax or Pulaski (three pounds minimum), and one dry chemical fire extinguisher, ABC rated (five pound minimum).
- Water tanker equipped with a minimum capacity of 500 gallons and:
  - One live hose reel or live hose basket with 250 feet of ¾-inch I.D., heavy duty rubber hose;
  - A portable or power takeoff pump with a discharge capacity of at least 20 gpm at 150 P.S.I. pressure with fuel (appropriately stored) to operate at least 2 hours;
  - Gear type pumps, which would be provided with a bypass or pressure relief valve; and

  - The tanker unit, which would have a nozzle of the shutoff-type, adjustable for straight stream, spray or fog, and at least 12 feet of hard suction hose of the appropriate dimensions for drafting with an intake screen adapter and an additional 250 feet of 1-inch cotton jacket, rubber-lined hose.

- Seal tool caches with a hasp, painted red and labeled "For Fire Use Only," containing at a minimum: one backpack pump type fire extinguisher filled with water; two axes or Pulaski fire tools; two Mcleod fire tools; a sufficient number of shovels so that each employee can be equipped to fight fire; and one serviceable powersaw of 31/2 or more horsepower with a cutting bar of at least 20 inches in length.

Post-Fire Rehabilitation Strategies

The purpose of the post-fire rehabilitation measures includes the following:

- Restoration of high quality wildlife habitat and various vegetation types.
- Restoration of range value.
- Suppression of invasive weeds.
- Prevention of increased fire hazard.
- Prevention of increased erosion.

The following post-fire rehabilitation measures would be implemented by SPPC:

- Reclamation of burn areas: all reclamation activities would require use of certified noxious weed-free seed. After a fire has been extinguished, the burn areas would be revegetated to the native vegetation using the appropriate seed mixtures. Because the proposed seed mixtures may vary, coordination with the BLM is necessary to determine the appropriate seed mixture for revegetation. For more details, refer to the *1999 Northern Nevada Fire Complex Burned Area Rehabilitation Plan* and Appendix E, Reclamation Plan of this Draft EIS.
- Monitoring and control of noxious weeds: the following measures would be implemented by SPPC:
  - SPPC and the contractor's off-road vehicles and ATV's would be inspected and receive high pressure air or water washing on the undercarriage if necessary, with special emphasis on axles, frame, cross members, motor mounts, underneath the steps, running boards, and front bumper/brush guard assemblies.
  - SPPC and the contractor would clean off-road equipment (power or high-pressure cleaning) of all mud, dirt, and plant parts before moving into weed-free areas.
  - SPPC and the contractor's employees working in the field would receive basic weed identification training.
  - SPPC would implement a Weed Monitoring and Abatement Plan as described in Appendix E, Reclamation Plan.

List of Fire Suppression Contacts

In case of a fire emergency in any area of the proposed project, first call 911.

Nevada Division of Forestry
State Forester Fire Warden: 775-687-4350
Fire Prevention Officer: 775-849-2500, ext. 227
Carson Valley Air Center: 775-687-4359

Battle Mountain BLM Field Office
Dispatch Office: 775-623-3444 (Fire Reporting)
BLM Field Office: 775-635-4000

Bureau of Land Management
Fire Calls: 911
Interagency Dispatch Center: 775-883-5995 or 1-800-535-6076
Wildfire Reporting: 775-883-3535

Ely BLM Field Office
Dispatch Office: 775-289-1925 or 775-289-8428

Elko BLM Field Office
Dispatch Office: 775-748-4000

U.S. Forest Service
Fire Calls: 775-883-3535

APPENDIX G

US FISH AND WILDLIFE SERVICE SPECIES LISTS

United States Department of the Interior

FISH AND WILDLIFE SERVICE

NEVADA FISH AND WILDLIFE OFFICE
1340 FINANCIAL BOULEVARD, SUITE 234
RENO, NEVADA 89502-7147

March 15, 2001
File No. 1-5-01-SP-084

Ms. Wendy Broadhead
Biologist/Ecologist
Tetra Tech EM, Inc.
1325 Airmotive Way
Reno, Nevada 89502

Dear Ms. Broadhead:

Subject: Updated Species List for Sierra Pacific Power Company's Falcon to Gonder 345 kV Transmission Line, Elko, Eureka, Lander, and White Pine Counties, Nevada

In response to your letter received on March 12, 2001, we have enclosed a list of endangered, threatened, proposed, and candidate species that may be present in the vicinity of the subject project as described for File No. 1-5-99-SP-183 (Enclosure A). As requested, we are also enclosing a list of species which occur in Elko County, Nevada (Enclosure B). These lists fulfill the requirement of the Fish and Wildlife Service to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended. Enclosure C provides a discussion of the responsibilities Federal agencies have under section 7(c) of the Endangered Species Act and the conditions under which a biological assessment (BA) must be prepared by the lead Federal agency or its designated non-Federal representative. Lists of published references dealing with the distribution, life history, and habitat requirements of the listed species are also enclosed (Enclosure D). This information may be helpful in preparing a BA for the proposed project, if one is required.

Included in Enclosures A and B are lists of other species of concern to the Service which may occur in the vicinity of the subject project. The Service has used information from State and Federal agencies and private sources to assess the conservation needs of these species. Determination of the conservation status of these taxa will require further biological research and field study. By considering these species and by exploring management alternatives early

in the planning process it may be possible to provide long-term conservation benefits for these species and avoid future conflicts that could otherwise develop. We recommend that you contact the Nevada Natural Heritage Program [1550 East College Parkway, Suite 145, Carson City, Nevada 89710, (775) 687-4245] and the appropriate regional office of the Nevada Division of Wildlife, as well as other local, State, and Federal agencies for distribution data and information on the conservation needs of these and other species of concern.

Because streams and wetlands are known to occur along the transmission line route, we ask that you be aware of potential impacts project activities may have on these areas. Discharge of dredged or fill material into wetlands or waters of the United States is regulated by the Army Corps of Engineers pursuant to section 404 of the Clean Water Act. We recommend you contact the Regulatory Section of the Army Corps of Engineers' Reno Field Office [300 Booth Street, Room 2120, Reno, Nevada 89509, (775) 784-5304] regarding the possible need for a permit.

We recommend that land clearing or other surface disturbance associated with proposed actions within the project area be timed to avoid potential destruction of active bird nests or young of birds that breed in the area. Such destruction may be in violation of the Migratory Bird Treaty Act (15 U.S.C. 701-718h). Under the Act, active nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If active nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Please reference File No. 1-5-01-SP-084 in future correspondence concerning this updated species list. If you have questions or require further information, please contact Selena Werdon at (775) 861-6300.

Sincerely,

Robert D. Williams
Field Supervisor

Enclosures

ENCLOSURE A

LISTED, PROPOSED AND CANDIDATE SPECIES
AND SPECIES OF CONCERN
THAT MAY OCCUR IN THE AREA OF THE

Sierra Pacific Power Company
Falcon to Gonder 345 kV Transmission Line
Eureka, Lander, and White Pine Counties, Nevada

File No. 1-5-01-SP-084; March 15, 2001

THREATENED (T), PROPOSED (P) AND CANDIDATE (C) SPECIES

Bird	
(T) Bald eagle	*Haliaeetus leucocephalus*
Fish	
(T) Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Bird	
(PT) Mountain plover	*Charadrius montanus*
Amphibian	
(C) Spotted frog	*Rana luteiventris*

SPECIES OF CONCERN

Mammals	
Pygmy rabbit	*Brachylagus idahoensis*
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Pacific Townsend's big-eared bat	*Corynorhinus townsendii townsendii*
Spotted bat	*Euderma maculatum*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Birds	
Northern goshawk	*Accipiter gentilis*
Western burrowing owl	*Athene cunicularia hypugea*

Ferruginous hawk	*Buteo regalis*
Black tern	*Chlidonias niger*
Least bittern	*Ixobrychus exilis hesperis*
Mountain quail	*Oreortyx pictus*
White-faced ibis	*Plegadis chihi*

Fish

Fish Creek Springs tui chub	*Gila bicolor euchila*
Newark Valley tui chub	*Gila bicolor newarkensis*
Relict dace	*Relictus solitarius*
Diamond Valley speckled dace	*Rhinichthys osculus* ssp.

Invertebrates

Nevada viceroy	*Limenitus archippus lahontani*
Steptoe Valley crescentspot butterfly	*Phyciodes pascoensis* ssp.

Plants

Eastwood's milkweed	*Asclepias eastwoodiana*
Nevada willowherb	*Epilobium nevadense*
Windloving buckwheat	*Eriogonum anemophilum*
Lewis buckwheat	*Eriogonum lewisii*
Least phacelia	*Phacelia minutissima*
Parish's phacelia	*Phacelia parishii*

ENCLOSURE B

LISTED AND CANDIDATE SPECIES AND SPECIES OF CONCERN
IN ELKO COUNTY, NEVADA

Threatened Species

Bird

Bald eagle	*Haliaeetus leucocephalus*

Fish

Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Bull trout	*Salvelinus confluentus*

Endangered Species

Fish

Independence Valley speckled dace	*Rhinichthys osculus lethoporus*
Clover Valley speckled dace	*Rhinichthys osculus oligoporus*

Candidate Species

Amphibian

Columbia spotted frog (Great Basin pop.)	*Rana luteiventris*

Species of Concern

Mammals

Pygmy rabbit	*Brachylagus idahoensis*
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Pacific Townsend's big-eared bat	*Corynorhinus townsendii townsendii*
Spotted bat	*Euderma maculatum*
North American wolverine	*Gulo gulo luscus*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Preble's shrew	*Sorex preblei*
Sierra Nevada red fox	*Vulpes vulpes necator*

Birds

Northern goshawk	*Accipiter gentilis*
Western burrowing owl	*Athene cunicularia hypugea*
Ferruginous hawk	*Buteo regalis*
Black tern	*Chlidonias niger*
Least bittern	*Ixobrychus exilis hesperis*
White-faced ibis	*Plegadis chihi*
Columbian sharp-tailed grouse *	*Tympanuchus phasianellus columbianus*

Fish	
Independence Valley tui chub	*Gila bicolor isolata*
Leatherside chub	*Gila copei*
Interior redband trout	*Oncorhynchus mykiss gibbsi*
Relict dace	*Relictus solitarius*
Invertebrates	
California floater	*Anodonta californiensis*
Mattoni's blue butterfly	*Euphilotes pallescens mattoni*
Nevada viceroy	*Limenitus archippus lahontani*
Schell Creek mountainsnail	*Oerohelix nevadensis*
Grey's silverspot butterfly	*Speyeria atlantis greyi*
Plants	
Meadow pussytoes	*Antennaria arcuata*
Grouse Creek rockcress	*Arabis falcatoria*
Elko rockcress	*Arabis falcifructa*
Goose Creek milkvetch	*Astragalus anserinus*
Robbins milkvetch	*Astragalus robbinsii* var. *occidentalis*
Barren Valley collomia	*Collomia renacta*
Broad fleabane	*Erigeron latus*
Lewis buckwheat	*Eriogonum lewisii*
Grimy ivesia	*Ivesia rhypara* var. *rhypara*
Grimes vetchling	*Lathyrus grimesii*
Bruneau River prickly phlox	*Leptodactylon glabrum*
Packard's stickleaf	*Mentzelia packardiae*
Least phacelia	*Phacelia minutissima*
Cottam cinquefoil	*Potentilla cottamii*
Ruby Mountain primrose	*Primula capillaris*
Jan's catchfly	*Silene nachlingerae*
Leiberg clover	*Trifolium leibergii*
Rock violet	*Viola lithion*

ENCLOSURE C

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7 (a) AND (c)
OF THE ENDANGERED SPECIES ACT

SECTION 7 (a): Consultation/Conference
Requires:

1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with the Fish and Wildlife Service (Service) when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species or critical habitat;

3) Conference with the Service when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7 (c): Biological Assessment - Major Construction Activity 1/
Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action on listed and proposed species. The process begins with a Federal agency requesting from the Service a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with the Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA:

1. An onsite inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat are present.

2. A review of literature and scientific data to determine species distribution, habitat needs, and other biological requirements.

3. Interviews with experts, including those within the Service, State conservation departments, universities, and others who may have data not yet published in scientific literature.

4. An analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat.

5. An analysis of alternative actions considered.

6. Documentation of study results, including a discussion of study methods used, any problems encountered, and other relevant information.

7. Conclusion as to whether or not a listed or proposed species will be affected.

Upon completion, the BA should be forwarded to our office with a request for consultation, if required.

1/ A construction project (or other major undertaking having similar physical impacts) is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332 (2) C).

United States Department of the Interior

FISH AND WILDLIFE SERVICE

NEVADA FISH AND WILDLIFE OFFICE
1340 FINANCIAL BOULEVARD, SUITE 234
RENO, NEVADA 89502-7147

April 6, 1999
File No. 1-5-99-SP-183

Ms. Susan Fox
Wildlife Resource Consultant
Post Office Box 8493
Truckee, California 96162

Dear Ms. Fox:

Subject: Species List for Falcon to Gondor Transmission Project, White Pine, Eureka, and Lander Counties, Nevada

This responds to your letter dated March 28, 1999 requesting a species list for the Sierra Pacific Power Company Falcon to Gondor transmission project. The project is approximately 500 miles in length and extends from the Gonder Substation near Ely west to Eureka and then heads north through Crescent Valley to the Falcon Substation north of Dunphy and west of Carlin.

The endangered, threatened, proposed, or candidate species in the locality of your transmission line include:

1.) The bald eagle *Haliaeetus leucocephalus*, which is threatened species that frequents northern Nevada including White Pine and Eureka counties during the winter.

2.) Lahontan cutthroat trout *Oncorhynchus clarki henshawi,* which is a threatened species, on the west side of Roberts Mountain in Birch and Pete Hansen Creek, and Trout Creek on the west side of the Pinon Range, all in Eureka County.

3.) The spotted frog *Rana luteiventris,* a proposed species, possibly in northern Eureka County.

4.) The mountain plover *Charadrius montanus,* a proposed species, has been sited in Diamond Valley near Eureka, Eureka County.

ENCLOSURE A

SPECIES OF CONCERN
THAT MAY OCCUR IN THE
FALCON TO GONDOR TRANSMISSION LINE AREA,
WHITE PINE COUNTY, NEVADA

File Number: 1-5-99-SP-183

Mammals	
Pygmy rabbit	*Brachylagus idahoensis*
Spotted bat	*Euderma maculatum*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Townsend's big-eared bat	*Corynorhinus townsendii townsendii*
Birds	
Northern goshawk	*Accipiter gentilis*
Western burrowing owl	*Athene cunicularia hypugea*
Ferruginous hawk	*Buteo regalis*
Black tern	*Chlidonias niger*
Least bittern	*Ixobrychus exilis hesperis*
White-faced ibis	*Plegadis chihi*
Fish	
Newark Valley tui chub	*Gila bicolor newarkensis*
Relict dace	*Relictus solitarius*
Invertebrates	
Steptoe Valley crescentspot butterfly	*Phyciodes pascoensis ssp.*
Plants	
Mone Neva paintbrush	*Castilleja salsuginosa*
Parish's phacelia	*Phacelia parishii*
Rock violet	*Viola lithion*

ENLOSURE C

SPECIES OF CONCERN
THAT MAY OCCUR IN THE
FALCON TO GONDOR TRANSMISSION LINE AREA,
LANDER COUNTY, NEVADA

File Number: 1-5-99-SP-183

Mammals	
Pygmy rabbit	*Brachylagus idahoensis*
Spotted bat	*Euderma maculatum*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Townsend's big-eared bat	*Corynorhinus townsendii townsendii*
Birds	
Western burrowing owl	*Athene cunicularia hypugea*
Ferruginous hawk	*Buteo regalis*
Black tern	*Chlidonias niger*
Least bittern	*Ixobrychus exilis hesperis*
White-faced ibis	*Plegadis chihi*
Mountain quail	*Oreortyx pictus*
Plant	
Windloving buckwheat	*Oriogonum anemophilum*

Ms. Susan Fox File No. 1-5-99-SP-183

This response fulfills the requirement of the Fish and Wildlife Service to provide a list of species pursuant to section 7 (c) of the Endangered Species Act of 1973, as amended.

For your consideration, a list of other species of concern to the Service that may occur in the project area is enclosed (Enclosures A, B, and C). The Service has used information from the State and other private interests to assess the conservation needs and status of these species. Further biological research and field study are needed to resolve their conservation status. One potential benefit of considering these other species of concern, is that by exploring alternatives early in the planning process, it may be possible to provide long-term conservation benefits for these species and avoid future conflicts that could otherwise develop. We recommend that you contact the Nevada Natural Heritage Program [1550 College Parkway, Suite 145, Carson City, Nevada 89710, (775) 687-4245] and the appropriate regional office of the Nevada Division of Wildlife, as well as other local, State, and Federal agencies for data on distribution and conservation needs for these and other species of concern.

Please reference File No. 1-5-99-SP-183 in future correspondence concerning this species list. If you have any questions or require additional information, please contact Patrick Coffin at (775) 861-6300.

Sincerely,

Stanley G. Williams

for Robert D. Williams
Field Supervisor

Enclosures

cc:
Supervisor, Battle Mountain Field Office, Bureau of Land Management, Battle Mountain, Nevada
Supervisor, Ely Field Office, Bureau of Land Management, Ely, Nevada
Biologist, U.S. Fish and Wildlife Service, Winnemucca, Nevada (Attn: Laura Berglund)

U. S. FISH AND WILDLIFE SERVICE
NEVADA FISH AND WILDLIFE OFFICE

NEVADA'S ENDANGERED, THREATENED, AND CANDIDATE SPECIES BY COUNTY
(Updated October 1998)

CARSON CITY RURAL AREA

Birds

E	American peregrine falcon	*Falco peregrinus anatum*
T	Bald eagle	*Haliaeetus leucocephalus*

CHURCHILL COUNTY

Birds

C	Mountain plover*	*Charadrius montanus*
E	American peregrine falcon	*Falco peregrinus anatum*
T	Bald eagle	*Haliaeetus leucocephalus*

Fish

T	Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*

CLARK COUNTY

Birds

C	Mountain plover*	*Charadrius montanus*
E	Southwestern willow flycatcher	*Empidonax traillii extimus*
E	American peregrine falcon	*Falco peregrinus anatum*
T	Bald eagle	*Haliaeetus leucocephalus*
E	Yuma clapper rail	*Rallus longirostris yumanensis*

Fishes

E	Devil's Hole pupfish	*Cyprinodon diabolis*
E	Pahrump poolfish	*Empetrichthys latos*
E	Bonytail chub	*Gila elegans*
E	Virgin River chub	*Gila seminuda*
E	Moapa dace	*Moapa coriacea*
T	Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
E	Woundfin	*Plagopterus argentissimus*
E	Razorback sucker	*Xyrauchen texanus*

Reptile

T	Desert tortoise	*Gopherus agassizii*

Plants

C	Blue Diamond cholla	*Opuntia whipplei* var. *multigeniculata*

DOUGLAS COUNTY

Birds

E	American peregrine falcon	*Falco peregrinus anatum*
T	Bald eagle	*Haliaeetus leucocephalus*

ELKO COUNTY

Birds

E	American peregrine falcon	*Falco peregrinus anatum*

T	Bald eagle	*Haliaeetus leucocephalus*
Fishes		
T	Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
E	Independence Valley speckled dace	*Rhinichthys osculus lethoporus*
E	Clover Valley speckled dace	*Rhinichthys osculus oligoporus*
E	Bull trout	*Salvelinus confluentus*
Amphibian		
C	Spotted frog	*Rana luteiventris*
Plant		
C	Sulphur Springs buckwheat	*Eriogonum argophyllum*

ESMERALDA COUNTY

Bird		
T	Bald eagle	*Haliaeetus leucocephalus*
Reptile		
T	Desert tortoise	*Gopherus agassizii*

EUREKA COUNTY

Birds		
C	Mountain plover*	*Charadrius montanus*
T	Bald eagle	*Haliaeetus leucocephalus*
Fish		
T	Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Amphibian		
C	Spotted frog	*Rana luteiventris*

HUMBOLDT COUNTY

Bird		
T	Bald eagle	*Haliaeetus leucocephalus*
Fishes		
T	Desert dace	*Eremichthys acros*
T	Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Amphibian		
C	Spotted frog	*Rana luteiventris*

LANDER COUNTY

Birds		
C	Mountain plover*	*Charadrius montanus*
T	Bald eagle	*Haliaeetus leucocephalus*
Fish		
T	Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Amphibian		
C	Spotted frog	*Rana luteiventris*

DOUGLAS COUNTY (continued)

Plants	
Lavin's milkvetch	*Astragalus oophorus* var. *lavinii*
Bodie Hills draba	*Cusickiella quadricostata*
Pine Nut Mountains ivesia	*Ivesia pityocharis*
Webber's ivesia	*Ivesia webberi*
Combleaf **	*Polyctenium* sp.
Tahoe yellowcress	*Rorippa subumbellata*

ELKO COUNTY

Mammals	
Pygmy rabbit	*Brachylagus idahoensis*
Spotted bat	*Euderma maculatum*
North American wolverine	*Gulo gulo luscus*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Pacific Townsend's big-eared bat	*Corynorhinus townsendii townsendii*
Preble's shrew	*Sorex preblei*
Sierra Nevada red fox	*Vulpes vulpes necator*
Birds	
Northern goshawk	*Accipiter gentilis*
Western burrowing owl	*Athene cunicularia hypugea*
Ferruginous hawk	*Buteo regalis*
Black tern	*Chlidonias niger*
Least bittern	*Ixobrychus exilis hesperis*
White-faced ibis	*Plegadis chihi*
Columbian sharp-tailed grouse *	*Tympanuchus phasianellus columbianus*
Fishes	
Independence Valley tui chub	*Gila bicolor isolata*
Leatherside chub	*Gila copei*
Interior redband trout	*Oncorhynchus mykiss gibbsi*
Relict dace	*Relictus solitarius*
Invertebrates	
California floater	*Anodonta californiensis*
Mattoni's blue butterfly	*Euphilotes rita mattoni*
Nevada viceroy	*Limenitus archippus lahontani*
Schell Creek mountainsnail	*Oerohelix nevadensis*
Grey's silverspot butterfly	*Speyeria atlantis greyi*
Plants	
Meadow pussytoes	*Antennaria arcuata*
Grouse Creek rockcress	*Arabis falcatoria*
Elko rockcress	*Arabis falcifructa*
Goose Creek milkvetch	*Astragalus anserinus*
Robbins milkvetch	*Astragalus robbinsii* var. *occidentalis*
Warren Valley collomia	*Collomia renacta*
Broad fleabane	*Erigeron latus*
Lewis buckwheat	*Eriogonum lewisii*

ELKO COUNTY (continued)

Plants (con't)	
Grimy ivesia	*Ivesia rhypara* var. *rhypara*
Grimes vetchling	*Lathyrus grimesii*
Bruneau River prickly phlox	*Leptodactylon glabrum*
Packard's stickleaf	*Mentzelia packardiae*
Least phacelia	*Phacelia minutissima*
Cottam cinquefoil	*Potentilla cottamii*
Ruby Mountain primrose	*Primula capillaris*
Jan's catchfly	*Silene nachlingerae*
Leiberg clover	*Trifolium leibergii*
Rock violet	*Viola lithion*

ESMERALDA COUNTY

Mammals	
Pygmy rabbit	*Brachylagus idahoensis*
Spotted bat	*Euderma maculatum*
California wolverine	*Gulo gulo luteus*
Small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
California bighorn sheep	*Ovis canadensis californiana*
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*
Birds	
Northern goshawk	*Accipiter gentilis*
Western burrowing owl	*Athene cunicularia hypugea*
Black tern	*Chlidonias niger*
Least bittern	*Ixobrychus exilis hesperis*
White-faced ibis	*Plegadis chihi*
Fish	
Fish Lake Valley tui chub	*Gila bicolor* ssp.
Invertebrates	
White Mountains skipper	*Hesperia mirimae* ssp.
White Mountains copper butterfly	*Lycaena rubicus* ssp.
White Mountains saepiolus blue	*Plebejus saepiolus* ssp.
White Mountains sandhill skipper	*Polites sabuleti albonmontana*
Wongs springsnail	*Pyrgulopsis wongi*
Plants	
Boundary Peak rockcress	*Arabis pinzlae*
Eastwood's milkweed	*Asclepias eastwoodiana*
Tecopa bird's beak	*Cordylanthus tecopensis*
Tiehm's buckwheat	*Eriogonum tiehmii*
Lone Mountain tonestus	*Haplopappus graniticus*
Holmgren's lupine	*Lupinus holmgrenanus*
Nevada oryctes	*Oryctes nevadensis*
Nevada dune beardtongue	*Penstemon arenarius*
Mono phacelia	*Phacelia monoensis*
Combleaf **	*Polyctenium* sp.
Masonic Mountain jewelflower	*Streptanthus oliganthus*

Nevada Natural Heritage Program

Department of Conservation and Natural Resources

1550 East College Parkway, Suite 145 * Carson City, Nevada 89706-7921
voice : (775) 687-4245 fax: (775) 687-1288 web: www.state.nv.us/nvnhp/

5 May 1999

Lynne Zonge
Summit Enviro Solutions
1475 Terminal Way Suite B
Reno NV 89502

RE: Data request received 21 April 1999

Dear Ms. Zonge,

We are pleased to provide the information you requested on endangered, threatened, candidate, and/or sensitive plant and animal taxa recorded near the Falcon to Gondor Pipeline. We searched our database and maps using the given township-range list, including all sections.

The enclosed printout lists the taxa recorded within the given area. Please be aware that habitat may also be available for Nevada willowherb, *Epilobium nevadense*; and Nachlinger catchfly, *Silene nachlingerae*; both are Nevada Bureau of Land Management Sensitive species and U.S. Forest Service Region 4 (Humboldt-Toiyabe NF) sensitive species. We do not have complete data on various raptors that may also occur in the area; for more information contact Gary Herron, Nevada Division of Wildlife at (775) 688-1500. Note that all cacti, yuccas, and Christmas trees are protected by Nevada state law (NRS 527.060-.120), including taxa not tracked by this office.

Please note that our data are dependent on the research and observations of many individuals and organizations, and in most cases are not the result of comprehensive or site-specific field surveys. Natural Heritage reports should never be regarded as final statements on the taxa or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Thank you for checking with our program. Please contact us for additional information or further assistance.

Sincerely,

Carrie A. Carreño
Acting Data Manager/Program Biologist

Sensitive Plant and/or Animal Taxa Recorded near the Falcon to Gondor Powerline
Compiled by Nevada Natural Heritage Program for Summit Environmental Solutions
29 April 1999

Scientific name	Common name	Usfws	Blm	Usfs	State	Grank	Townrange	Section	Lat	Long	Prec	Last observed
PLANTS												
Draba pennellii	Pennell draba			S		G2	017N063E	9	392105N	1145330W	S	5/14/85
Eriogonum beatleyae	Beatley buckwheat					G2Q	026N048E	3	400908N	1163307W	M	7/11/37
Phacelia minutissima	least phacelia	<C2	N	S		G2	022N051E	19	395057N	1161654W	S	7/18/83
FISHES												
Gila bicolor newarkensis	Newark Valley tui chub	<C2	P		YES	G4T1	023N056E	36	394845N	1153655W	S	9/11/34
AMPHIBIANS												
Rana lutelventris	Columbia spotted frog	C	S	S		G4	028N052E	19	401751N	1160852W	G	8/12/38
MAMMALS												
Myotis ciliolabrum or *californicus* (indet.)	western small-footed or California myotis	<C2	N			G5	019N053E				M	1941-12

U. S. Fish and Wildlife Service (Usfws) Categories for Listing under the Endangered Species Act:

- C — Candidate
- <C2 — Former Category 2 Candidate, now species of concern

Bureau of Land Management (Blm) Species Classification:

- S — Nevada Special Status Species - USFWS listed, proposed or candidate for listing, or protected by Nevada state law
- N — Nevada Special Status Species - designated Sensitive by State Office
- P — Proposed Nevada Special Status Species

United States Forest Service (Usfs) Species Classification:

- S — Region 4 (Humboldt-Toiyabe NF) sensitive species

Nevada State Protected (State) Species Classification:

- YES — Species protected under NRS 501.

Precision (Prec) of Mapped Occurrence:

Precision, or radius of uncertainty around latitude/longitude coordinates:

- S — Seconds: within a three-second radius
- M — Minutes: within a one-minute radius, approximately 2 km or 1.5 miles
- G — General: within about 8 km or 5 miles, or to map quadrangle or place name

Nevada Natural Heritage Program Global (Grank) and State (Srank) Ranks for Threats and/or Vulnerability:

- 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 Nevada at the lowest taxonomic level
  - 1 — Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, imminent threats, or other factors
  - 2 — Imperiled due to rarity or other demonstrable factors
  - 3 — Vulnerable to decline because rare and local throughout its range, or with very restricted range
  - 4 — Long-term concern, though now apparently secure; usually rare in parts of its range, especially at its periphery
  - 5 — Demonstrably secure, widespread, and abundant
  - A — Accidental within Nevada
  - B — Breeding status within Nevada (excludes resident taxa)
  - H — Historical; could be rediscovered
  - N — Non-breeding status within Nevada (excludes resident taxa)
  - Q — Taxonomic status uncertain
  - U — Unrankable
  - Z — Enduring occurrences cannot be defined (usually given to migrant or accidental birds)
  - ? — Assigned rank uncertain

We're Special (photos) updated July 6, 1998

BLM is required by the Threatened and Endangered Species Act of 1973, as amended to ensure that no action on the public lands jeopardizes a threatened, endangered, or proposed species.

Threatened, endangered, proposed, and candidate species of the Battle Mountain BLM District include:

Species	**Status**
Mammals	
none	
Birds	
bald eagle (*Haliaeetus leucocephalus*) within the district)	Threatened (a winter visitor, no known nests
peregrine falcon (*Falco peregrinus*) relative of our common prairie falcon; no known nests within the district)	Endangered (an occasional visitor and close
mountain plover (*Charadrius montanus*) within NV)	Candidate (a migrant visitor; not known to nest
Fish	
Railroad Valley Springfish (*Crenichthys nevadae*)	Threatened
Lahontan Cutthroat Trout (*Oncorhynchus henshawi*)	Threatened
Reptiles	
Desert Tortoise (*Gopherus agassiszii*)	Threatened
Amphibians	
Spotted Frog *(Rana pretiosa*)	Candidate
Invertebrates	
none	
Plants	
Sodaville Milkvetch (*Astralagus lentigenosus*)	Proposed Threatened

In addition to federally designated species, BLM also protects other ***special status*** plants and animals. The list includes certain species designated by the state of Nevada, as well as species designated as "sensitive" by the Nevada BLM State Director. Special status species known to occur within the Battle Mountain District include:

Scientific Name	Common Name
Mammals	
Euderma maculatum	spotted bat
Myotis ciliolabrum	small-footed myotis
Myotis evotis	long-eared myotis
Myotis volans	long-legged myotis
Plecotus townsendii pallescens	pale Townsend's big-eared bat
Plecotus townsendii townsendii	Pacific Townsend's big-eared bat
Thomomys umbrinus abstrucus	Fish Spring pocket gopher
Thomomys umbrinus curtatus	San Antonio pocket gopher
Birds	
Aquila chrysaetos	golden eagle
Accipiter gentilis	northern goshawk
Buteo regalis	ferruginous hawk
Buteo swainsoni	Swainson's hawk
Charadrius alexandrinus nivosus	western snowy plover
Centrocercus urophasianus	western sage grouse
Oreortyx pictus	mountain quail
Pandion haliaetus	osprey
Plegadis chihi	white-faced ibis
Speotyto cunicularia	burrowing owl
Fishes	
Gila bicolor euchila	Fish Creek Springs tui chub
Gila bicolor ssp.	Big Smoky Valley tui chub
Gila bicolor ssp.	Fish Lake Valley tui chub
Gila bicolor ssp.	Railroad Valley tui chub
Gila bicolor ssp.	Hot Creek Valley tui chub
Rhinichthys osculus lariversi	Big Smoky Valley speckled dace
Rhinichthys osculus ssp.	Monitor Valley speckled dace
Rhinichthys osculus ssp	Oasis Valley speckled dace
Amphibians	
Bufo nelsoni	Amargosa toad
Invertebrates	
Aegialia crescenta	Crescent Dune aegialian scarab
Hesperia uncas ssp.	Railroad Valley skipper
Hesperopsis gracielae	MacNeill sooty wing skipper
Pyrgulopsis micrococcus	Oasis Valley springsnail
Pyrgulopsis wongi	Wongs springsnail
Serica sp.	Crescent Dune serican scarab

Plants	
Arabis falcifructa	Elko rockcress
Arabis ophira	Ophir rockcress
Asclepias eastwoodiana	Eastwood milkweed
Astragalus funereus	black woollypod; Funeral milkvetch;
Astragalus oophorus var. *lonchocalyx*	long-calyx eggvetch; pink e.
Astragalus remotus	Spring Mountain milkvetch
Astragalus robbinsii var. *occidentalis*	Lamoille Canyon milkvetch; Ruby m.;
Astragalus toquimanus	Toquima milkvetch
Astragalus unciallis	Currant milkvetch
Camissonia megalantha	Cane Spring evening-primrose
Castilleja salsuginosa	Monte Neva paintbrush
Cymopterus goodrichii	Goodrich biscuitroot; G. parsley
Epilobium nevadense	Nevada willowherb
Eriogonum anemophilum	windloving buckwheat
Eriogonum tiehmii	Tiehm buckwheat
Jamesia tetrapetala	waxflower
Penstemon arenarius	Nevada dune beardtongue
Phacelia minutissima	least phacelia
Polyctenium williamsiae	Williams combleaf
Sclerocactus blainei	Blaine pincushion; B. fishhook cactus
Sclerocactus nyensis	Nye pincushion
Silene nachlingerae	Jan's catchfly; Nachlinger catchfly
Sphaeralcea caespitosa	Jones globemallow
Streptanthus oliganthus	Masonic Mountain jewelflower; M. M. twistflower

Public Meetings Announcement

Public meetings
on the
Falcon to Gonder 345kV Transmission Project
Draft Environmental Impact Statement / Resource Management Plan Amendments
will be held in the following locations from 7:00 p.m. to 9:00 p.m. on the dates indicated:

June 19, 2001. Carlin City Hall Court Room, 101 South 8th Street, Carlin, NV

June 20, 2001. Eureka Opera House, 31 South Main Street, Eureka, NV

June 21, 2001. BLM Ely Field Office, 702 North Industrial Way, Ely, NV

All are welcome to attend and make comments on the
Draft Environmental Impact Statement / Resource Management Plan Amendments document.
Representatives from U.S. Bureau of Land Management and Sierra Pacific Power Company
will be there to answer questions about the proposed project.

BLM LIBRARY
BLDG 50, ST-150A
DENVER FEDERAL CENTER
P.O. BOX 25047
DENVER, COLORADO 80225