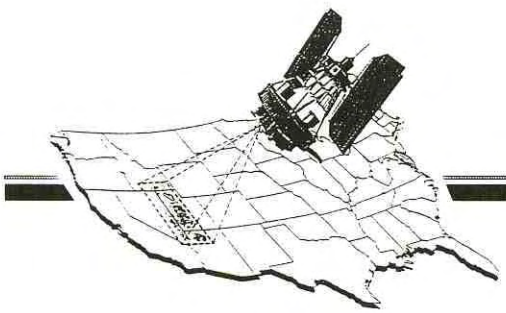


CHAPTER 3

MODIFICATIONS AND ADDITIONAL STUDIES

CHAPTER 3
MODIFICATIONS AND ADDITIONAL STUDIES

PURPOSE AND NEED

Because of public concern about the purpose and need for the Southwest Intertie Project (SWIP) Draft Environmental Impact Statement (DEIS/DPA), additional information about the Purpose and Need is presented in this chapter. This information is an expansion of the Purpose and Need described in Chapter 1 of the SWIP DEIS/DPA.

Introduction

Today's electric generation and transmission system play a critical role in the nation's economic and social well being. Many utility customers take its operation for granted as they enjoy electric services relatively free of interruption. There is an increasing need for utilities in the western United States to work cooperatively to maintain greater resource and transmission flexibility and enhance service reliability through transmission system interconnections.

Electric utilities are responsible for providing adequate supplies of reliable, economic electricity to their customers. The present load growth in the western United States, coupled with the expense and difficulties of building new generating resources, reinforces the need to provide for inter-regional transfers of energy.

The principal function of any interconnected transmission system is to provide for the reliable transfer of electric energy from one regional electric system to another, including generation from plants at various locations within that regional system to various load centers at other locations. The integration of large and small generating units in a transmission network permits not only efficient economic dispatch of power within regions during normal conditions, but also the transfer of power between regions during emergencies. The strategic importance of transmission is much greater than is indicated by its relative low cost as compared to the overall cost of electricity. Adequate interconnections provide the key to generation resource diversity, sharing of reserve generating capacity, and efficient utilization of conservation and new or existing generating capacity. In short, interconnection is the coordinating medium that makes possible the most efficient use of electrical facilities in any area or region.

Diversity Between Regions of the WSCC

There is a regional need to take advantage of the seasonal diversity which exists between the loads and resources of the Northwest and the Southwest. Purchases and exchanges over the SWIP would help the entire Western Systems Coordinating Council (WSCC) region meet load growth by utilizing existing resources more efficiently. It is this seasonal diversity, specifically between the Arizona-New Mexico Power Area (ANMPA) and the Northwest Power Pool (NWPP) and between the NWPP and the California-Southern Nevada Power Area, that the SWIP is needed to serve. There are adequate

markets in both the NWPP and the Southwest for over 1200 megawatts (MW) of seasonal diversity transmission with a resulting potential for deferring significant generation resource additions.

Figure 3-1 illustrates the projected WSCC regional peak and average loads, generation capability, inter-regional transfer capability, and summer/winter load diversity for the year 2000 (WSCC 1992 IE-411). The generation capacity numbers reflect all generators at their rated capacity, but are not representative of actual available resources at any one time (does not include reserve margin, effects of variable water flows, or the impacts of unplanned outages). For example, in the NWPP region, the reserve margin requirements total approximately 8000 MW. Therefore, the planned available capacity for the year 2000 is 61,000 MW (total installed capacity = 69,000 MW). The available seasonal diversity in this figure is the difference between the peak winter load and the peak summer load of that region. The inter-regional transfer capability shown is the rated capability expected for the year 2000 less the firm inter-regional generation transfers.

Northwest Power Pool

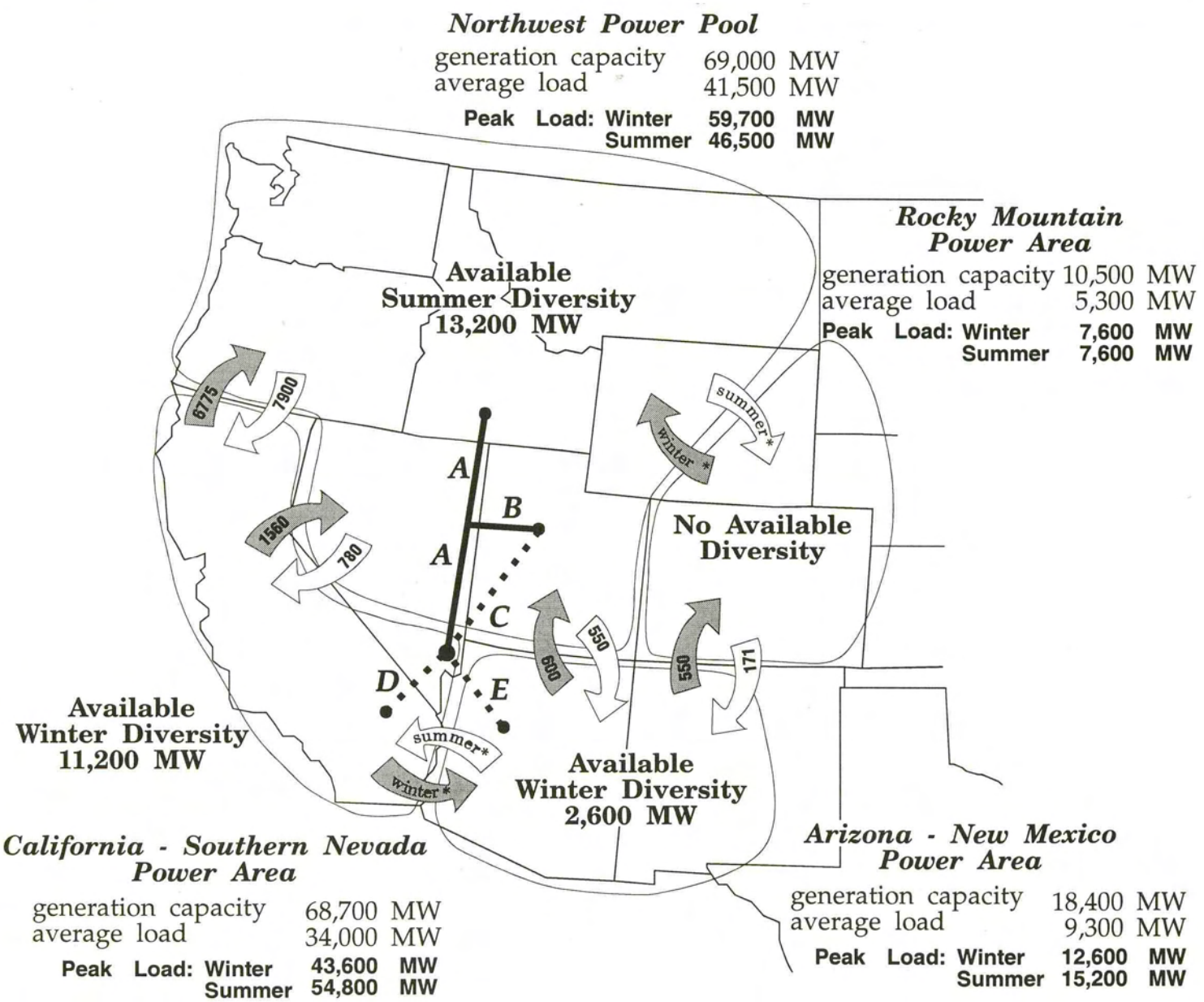
The NWPP has about 13,200 MW of seasonal load diversity available during the summer peak period. The total summer export capability from the NWPP is about 9200 MW (7900+780+550). During the winter, there is about 13,800 MW of seasonal load diversity available in the California and Arizona power areas. The total winter import capability to the NWPP is about 8900 MW (6775+1560+600). About 3000 MW of seasonal load diversity remains untapped and available for seasonal exchange.

The transfer capability between the NWPP and the California-Southern Nevada Power Area is in two major paths. The northwestern path is made up of the Pacific Alternating Current (AC) Intertie (3-500 kilovolt (kV) transmission lines = 4800 MW north to south and 3675 MW south to north) and the Pacific Direct Current (DC) Intertie (+/- 500kV = 3100 MW bi-directional). The southwestern path is made up of three subcomponents, the Sierra Pacific Power-Pacific Gas and Electric transmission lines (2-120kV lines and 1-60kV transmission line = 160 MW bi-directional), the PacifiCorp-Nevada Power transmission line (345kV = 300 MW north to south), and the Intermountain Transmission System (ITS) DC transmission line (+/-500kV = 1920 MW north to south and 1400 MW south to north). The ITS has a total capability of 1920 MW, however, 1600 MW are reserved for Intermountain Generating Station (IGS). The south to north capability is restricted by two 345kV ITS/PacifiCorp interconnections. In order to utilize this 1920 MW ITS capability, the IGS generation would need to be displaced which is not likely due to its low power production cost.

The transfer capability between the NWPP and the ANMPA is made up of one 230kV PacifiCorp/Western Area Power Administration (WAPA) interconnection and one 345kV PacifiCorp/Arizona Public Service transmission line. Together these transmission lines are rated at 550 MW north to south and 600 MW south to north. The 345kV interconnection capability is usually restricted by ANMPA system transfers south and west of the Four Corners area.

Rocky Mountain Power Area

The transfer capability between the Rocky Mountain Power Area (RMPA) and the NWPP is not significant due to internal transmission constraints. The RMPA has little seasonal diversity.



Note: all values in megawatts (MW), peak load excludes interruptable load

SWIP Projects (A & B)
Other Proposed Projects (C,D,E)

Map Symbol	Transmission Project	Transmission Rating (MW)
A	SWIP (Midpoint to Dry Lake)	1200
B	SWIP (Ely to Delta)	1100
C	Utah-Nevada (UNTP)	1100
D	Mead-Adelanto	1200
E	Mead-Phoenix	1300

Transmission Capacity is firm capability less firm inter-area generation transfers.

winter summer

* Transfer capability not significant due to internal transmission or no inter-area seasonal diversity.

SOURCE: WSCC 1992 IE-411 Report

WSCC Seasonal Diversity Potential for the Year 2000

Figure 3-1

The transfer capability between the RMPA and the ANMPA is shown as the combination of the 230kV and 345kV transmission lines between Colorado and Arizona-New Mexico. The transmission lines are capable of 550 MW bi-directionally, however, a firm generation integration commitment of 379 MW north to south exists.

Arizona-New Mexico Power Area

The ANMPA has about 2600 MW of seasonal diversity available during the winter peak period. Of this 2600 MW, only about 600 MW are currently usable between the ANMPA and the NWPP.

The transfer capability between ANMPA and the California-Southern Nevada Power Area is about 7000 MW, with nearly half of this capability committed for firm generation integration commitments. This transmission path is generally not significant for seasonal diversity exchanges due to the two regions having coincidental peaks.

Diversity Benefits from Interconnections

Current forecasts of utility resource requirements portray the fact that the future is uncertain and identify steps to reduce the risks resulting from that uncertainty. For the same reasons that investors diversify investment portfolios to minimize the risks associated with individual stocks, utilities seek to diversify their system resources to minimize the risks associated with individual resource options. To reduce the risks associated with uncertainty of load growth, utility planners favor resources (e.g., transmission interconnection, new power plants, or other generation facilities) that can be developed in the shortest possible length of time, or shortest "lead time". Reducing the lead time needed to acquire new resources allows the actual commitment to construct a resource to be made when forecasting uncertainty has been reduced as much as possible. Taking advantage of regional diversity through the SWIP would increase the number of resource options available to a utility and would serve as a tool for reducing the risk of overbuilding or underbuilding generating resources as a result of load and resource uncertainties.

Transmission lines play a major role in managing the costs of an electric system service. Adequate and available transmission capacity allows interaction between supplies and markets for the most economical exchange of power, with benefits including:

- *Diversity of Area and Use* - Over the history of electric system development, diversity was first captured in neighborhoods, then cities and regions as transmission systems were expanded. The fact that the system is used at different times for different purposes means that the broader the area the system encompasses, the fewer generating resources are required to serve it, lowering the total amount of required generation.

- *Market Diversity* - Competitive forces should drive down the cost of the utilities' future resource options as suppliers of generation and conservation gain access to the transmission grid.

- *Fuel and Supply Diversity* - Transmission provides a way to enhance plans for environmental mitigation between regions. For example, generation may be reduced in one region during times when there are air quality concerns or river flows may be increased for migrating salmon. Transmission also provides shifting among fuel supplies (e.g., coal versus natural gas) for cost savings as prices fluctuate or as air emission requirements change.

Conservation and Demand-Side Management

Conservation and other demand-side management programs are expected to reduce, but not eliminate, the region's need for new generating resources. Conservation and demand-side management programs are an integral part of the resource strategy of every utility considering partnership in the SWIP. Regulatory requirements dictate that supply-side and demand-side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. However, conservation does not correspondingly reduce the value of regional transmission for minimizing resource costs.

Even with reduced generating requirements, environmental and economic considerations may require siting new generation at substantial distances from population and load centers, thus requiring transmission such as the SWIP. Regional conservation may be more fully developed given the availability of adequate regional transmission. Without such transmission, the cost effectiveness of conservation programs must be determined on the basis of the avoidable generating resource costs of an individual utility. Utilities having a lower avoided cost may be unable to develop economical conservation resources at the same level as those utilities with a higher avoided cost. With transmission, conservation throughout the region could be developed to the level of the highest avoidable generating costs in the region.

Transmission facilities like the SWIP would contribute to the region's task of meeting future load growth most efficiently with the least amount of new generating capacity. It is important to recognize the seasonal load diversity within the region. Transmission would allow existing resources to be used to serve seasonal load requirements in one part of the region while also meeting new load growth requirements in another part of the region. Therefore, total regional resource requirements (e.g., generation) can be reduced by transmission. Transmission, such as the SWIP, should be considered as a resources option along with new generating resources.

Utility Cost Minimization Initiatives

The goal of electric utilities is to provide reliable electrical service at the lowest reasonable infrastructure cost. Both state and federal regulatory agencies establish rules and review the proposed actions of utility companies to assure that electrical consumers are provided service at the lowest possible costs. Recent industry initiatives to minimize costs have focused on three areas:

- *Integrated Least Cost Planning* - Utilities are required by state utility commissions to consider both conservation and new generation options equally in developing a resource plan that achieves the lowest cost to electrical consumers.

- *Free Enterprise in the Generation Market* - Additional competition in the generation market brought about by independent power producers allows the market's competitive forces to drive down the cost of new generation. Generation represents the largest cost component of the electric power system.

- *Environmental Costs* - As part of the Clean Air Act, governmental and regulatory bodies are attempting to establish values for emissions from power plants to quantify and reduce "total societal costs" associated with resource options.

Environmental and Consumer Benefit Tests

Transmission lines must meet two tests to be shown beneficial to society: environmental impacts and consumer benefits. The first test is to determine if the potential impacts of the transmission line would be environmentally acceptable, and the second is the consumer benefit test. Until a project has cleared environmental hurdles it is not considered prudent to include it in least cost plan alternatives. Utilities cannot make plans to meet service requirements without some confidence that a resource option will be possible. Further, to do so would presume a favorable decision through the National Environmental Policy Act (NEPA) process.

As the nation continues to reduce dependence on imported oil, renewable energy resources such as wind, solar, geothermal, biomass, and hydropower which may be available only at fixed sites need to be encouraged through better access to markets. In order to economically develop these resources, as well as other independently developed power plants, their developers must have access to transmission facilities to move the power to utilities that need additional sources of power.

The SWIP could facilitate transactions which help protect the environment. For example, transmission contracts could be structured which redistribute inter-regional generation in such a way that northwest river flows could aid in the salmon recovery process. There are currently many proposals being considered regarding the operation of federal dams on the Columbia River. It is unknown how Columbia River operations and salmon recovery plans will affect northwest-southwest power exchanges at this time. As environmental costs become an important consideration in the resource planning process, low environmental cost (green) resources become more important. The ability to move these green resources to the load centers would be expanded with the addition of the SWIP.

The second test is the consumer benefit test. Utilities must demonstrate to their regulators that a transmission line would reduce the total costs, thereby benefiting the consumers. Once the project (i.e., the SWIP) is permitted, utilities may then begin including the project in their least cost plans. When and if a sufficient number of utilities have demonstrated the cost effectiveness of the project to their regulators, those project participants would move the project forward (i.e., implement that part of their least cost plan).

Generation vs. Transmission

When utilities consider whether to jointly build generation and share it via transmission, or build redundant plants in their respective service territories, they must consider:

- power plant construction cost
- transmission line construction cost
- the extent to which generation can be shared because of regional diversity
- transmission energy losses

For example, if we assume that a power plant is needed for summer air conditioning in the Southwest, and in the winter needed for light and heat-related loads in the Northwest, there is potential for sharing a generating station.

"Despite the progress of the last 10 years, the region enters the 1990s without the capability to successfully run conservation programs in all sectors of the economy and without an inventory of resources that can be developed quickly. Even with moderate growth, the region will need an additional 2000 MW by the turn of the century. Of all the options the region faces, inaction would expose the people and the economy to the greatest risk." (Northwest Power Planning Council, 1991).

In response to this, northwest utilities are soliciting proposals for new generating stations and conservation projects during the 1990s. The Idaho Power Company (IPCo) is sponsoring conservation programs and constructing power plant enhancements. California and Nevada utilities are taking similar actions. Desert Southwest utilities anticipate similar requirements later in the decade.

There is wide recognition in the electric utility industry that new transmission would make the best use of the scarce capital available for resource development by providing for the sharing of resources. There are new transmission projects proposed and being built to provide additional capacity between the Northwest and California, and between the Desert Southwest and California. The SWIP would increase the capacity between the Northwest and Southwest. That interconnection is important to extend the cost savings of transmission to the West.

Construction Costs

As part of their least cost planning, utilities routinely examine the average cost of bringing additional capacity into their systems. Least cost options are determined, in part, by evaluating the cost per kilowatt for various resources:

- a coal plant costs approximately $1200 per kilowatt
- a natural gas plant costs approximately $600 per kilowatt
- conservation may cost approximately $900 per kilowatt (conservation in one region can free resources to supply another region in lieu of new generation)
- transmission costs approximately $300 per kilowatt (assume 500 miles at 1200 MW capacity is approximately $360,000,000)

Note: These numbers are conceptual order of magnitude estimates and do not reflect any particular project costs.

Using these examples: (1) a coal generating station with one fourth (300/1200) of its output shared between regions would justify transmission, rather than building plants in two locations, (2) a natural gas plant with one half (300/600) of its output shared would justify transmission, and (3) the transmission would be justified if it would free one third (300/900) of the energy saved from conservation for use in another region.

Losses on a transmission system of this distance are typically 4 percent to 6 percent of the energy transmitted. The cost of losses would adjust the above ratios to determine whether the transmission was justified.

Transmission System Reliability

The WSCC is an organization of utilities throughout the western U.S. that was organized in August 1967. It establishes reliability criteria and provides the coordination which is essential for operating and planning a reliable and adequate electric power system for the western part of the continental U.S., Canada, and Mexico.

Due to the vastness and diverse characteristics of the region, WSCC's members are faced with unique and challenging problems both in coordinating the day-to-day interconnected system operation and the long-range planning needed to provide reliable and affordable electric service to more than 59 million people in WSCC's service territory.

It has become apparent to the WSCC and its member utilities that the bulk power system in the western U.S. and parts of Canada has evolved into a highly integrated interconnected system.

The SWIP would significantly improve the reliability of the regional power system. A WSCC study indicated the potential for voltage instability in several areas under transmission or generation outage conditions during peak demand periods. Voltage instability can result in the uncontrolled loss of customer load. Steps are being taken to mitigate the problem by installing new transmission equipment and interconnecting segregated systems, like the Intermountain area, to more stable regional systems. The SWIP would directly reinforce the Intermountain area which would improve system reliability and reduce the likelihood of isolating areas from the regional system. It would provide additional transmission capacity to help support the electrical integrity of the western system in the event of the loss of critical generation or transmission facilities.

By interconnecting the SWIP and the Utah-Nevada Transmission Project (UNTP), the SWIP Crosstie (hereafter referred to as the Ely to Delta segment) would provide an alternative path if either transmission line were curtailed due to scheduled or unscheduled outages. This would allow for optimal transfer capability ratings for the SWIP and the UNTP systems. The resulting interconnected system would have a larger transfer capacity than would be possible if these projects were not interconnected.

The total electrical strength of all ties between the northern and southern portions of the transmission system in the West would significantly increase with the construction of the SWIP. This would reduce the potential for and the severity of electrical disturbances during operating emergencies. Reliability would be increased by providing an additional transmission path between Idaho, Nevada, and Utah. The geographical and electrical separation between existing north-south transmission facilities and the SWIP would be substantial. This separation would increase system reliability by reducing the portion

of all major north-south ties that can be disrupted by a single event, such as an earthquake, storm, or vandalism.

Regional Economic Benefits of the SWIP

Capturing current and future efficiencies within the electric power system of the western United States would provide regional economic benefits. Interconnecting the systems of the Northwest and Southwest with firm transmission access via the SWIP's proposed "open marketplace" concept would allow the regions' utilities to realize these efficiencies. Open access to other regions would facilitate creative energy transactions which, driven by the forces of the open market, would take economic advantage of the load and resource diversities between the regions. Energy transactions between interconnected utilities would better use existing internal transmission capacity. These transactions would benefit the wheeling utility by creating revenues that can be applied against its internal system costs, including seasonal exchanges, resource coordination, nonfirm sales and purchases, firm sales and purchases, and reserve sharing. Interconnections between utilities would also provide other benefits including improved system reliability and environmental enhancements.

The addition of the SWIP would allow utilities in the Northwest and Southwest to add capacity and reliability to the western electrical system at an economical price. Specifically, the SWIP would fulfill the major needs as outlined below:

Seasonal Exchanges

Seasonal exchanges provide benefits by taking advantage of the load pattern diversities between regions. By directly interconnecting and exchanging power between the winter peaking Northwest and the summer peaking Southwest, both regions would benefit from increased operating efficiencies of existing resources. Seasonal exchange transactions could reduce operating expenses through fuel diversity, as well as reduce capital cost expenditures by deferring costly new generating resources.

The SWIP would allow the Northwest, the Southwest, and the Intermountain areas to take advantage of the various load pattern diversities including variations in electrical demand and supply within the region. The Ely to Delta segment would create an additional bi-directional transfer path between the Northwest and the Intermountain regions of the West. Currently, these areas are interconnected only by lower voltage transmission lines with limited electric load-carrying capability. It would also create an additional bi-directional transfer path between the Intermountain area and the Southwest including southern Nevada. This is an area that is rapidly growing and is in need of additional energy and capacity resources to serve its native load.

Resource Coordination

The SWIP would enable regional resources with diverse generating characteristics to operate jointly in a manner that increases overall operating efficiencies. For example, the Northwest could use the surplus peaking capacity and storage capability of its hydro system in conjunction with the base loaded thermal resources of the Southwest, thus increasing load-carrying capability as well as reducing

production costs. Resource coordination agreements, like seasonal exchanges, benefit the utilities by both reducing operating expenses and potentially deferring new generating resources.

Nonfirm Sales and Purchases

Nonfirm sales and purchases provide benefits by lowering the total power production expenses of the parties involved. Nonfirm or economy transactions accomplish this by taking advantage of the diversity in incremental production costs between generating resources, such as displacing oil resources with coal resources or displacing coal with hydro. The purchasing party benefits from lower production expenses than it would have otherwise incurred, while the selling party benefits from the revenues received that are in excess of its incremental production costs. Nonfirm transactions are generally short-term in nature, ranging from the next hour to several months, since incremental costs are very sensitive to the uncertainty of future load requirements, generating unit availability, and fuel costs or availability, such as spot gas prices or winter snow pack.

Firm Sales and Purchases

Firm agreements tend to be longer in term and place a higher level of obligation on both parties. As such, they are included in the utility's long-term planning process. The economic benefits derived from firm sales and purchases are therefore somewhat broader than those of the nonfirm market. Firm transactions benefit the purchaser by deferring large capital outlays associated with the acquisition of a new generating resource. They benefit the seller by sharing the output and the fixed costs of an existing resource until such time as the seller can fully utilize the resource.

Reserve Sharing

Reserve margin is generating capacity that must be available to respond to emergency conditions. Additional transmission capacity between the Northwest and Southwest would enhance the utilities' abilities to meet these reserve margin requirements by using the load and resources diversities that exist between regions. Thus, reserve sharing would benefit the utilities by optimizing the existing and future regional resources in meeting reserve margins.

Existing and Future Generation

Utilities attempting to reduce their need for new generation construction look to existing generating stations with surplus capacity. Many of these plants, designed for forecasted demands that were not realized due to shifts in growth and energy conservation efforts, are oversized for current demand. They now provide cost-effective alternatives to new plant construction. Regional transmission access to these plants is either non-existent or constrained by systems currently loaded to capacity. The economics of pursuing transmission facilities to access regional surpluses to displace more costly generation justifies a regional intertie network necessary for cost-effective load management.

Bonanza Generating Station (Bonanza)

The Deseret Generation and Transmission Cooperative (DG&T), a Utah cooperative, has constructed and operates Bonanza, a coal-fired generating station consisting of a 400 MW unit, plus possible construction of a second 400 MW unit. The Bonanza plant has a dedicated coal mine with a dedicated rail system. The Bonanza site is approximately 7 miles northwest of Bonanza, Utah.

Nevada is uniquely positioned between Rocky Mountain and Northwest energy sources and California and Southwest consumption centers. As such, having open market substations as well as access to these stations (e.g., the Ely area) is essential in this keystone state. The Ely to Delta segment would provide a critical path for the DG&T to access these marketplace substations in Nevada where energy transactions can take place.

Intermountain Generating Station (IGS)

The IGS was constructed on behalf of a group of Utah, California, Nevada, Wyoming municipalities, rural electric cooperatives, and a privately owned company to supply their respective communities with a firm supply of electrical energy. The IGS, as proposed, was to construct and operate four 750 MW, coal-fired units, two of which are currently operational. The IGS currently supplies Los Angeles and other southern California cities with over 25 percent of their electrical energy needs over the 500kV DC transmission line.

The Ely to Delta segment would create a supplementary transmission link to the IGS which would reduce the potential for a serious electrical disturbance to the interconnected Utah electrical system. Presently, a lower voltage transmission line interconnects the IGS to the electrical system in Utah. However, this transmission line is less robust and requires a complicated remedial action scheme and relays designed to protect Utah's electrical system(s) from a DC transmission failure.

The Ely to Delta segment would also reduce the potential for, and severity of, electrical disturbances to the existing and future IGS generation units.

White Pine Power Project (WPPP)

The WPPP, although no construction dates have been scheduled, is a major option in future resource planning for the City of Los Angeles and other metropolitan areas.

The Los Angeles Department of Water and Power (LADWP), as many utilities throughout the country, has implemented conservation, load management, and customer energy efficiency programs. The LADWP has projected a deferment of 600 MW of supply-side resource requirements by the year 2000 as a result of implementing demand-side management programs. When these programs are combined with the SWIP transmission system, they would provide access to the surplus generation in the Northwest and Intermountain regions of the country. The LADWP could defer the need for major new generating plants during the next ten years.

Due to the financial risk associated with the large capital expenditures required to build new generating facilities, utilities are reluctant to commit to large new projects. The cost of the transmission system associated with generation projects is a relatively small percentage (10 to 15 percent) of the total project cost, yet the billions of dollars invested in a power plant can be held hostage awaiting transmission system permitting, approval, and construction. One factor that often impairs the ability to install new resources in a timely manner is the long lead times required to fulfill the permitting process. Therefore, these transmission lines must be assured or be in place before the decision to construct future WPPP units can be made.

CUMULATIVE EFFECTS

Anticipated Utility Projects in the Ely Area

Scenario 1 - Cutoff Route to North Steptoe/Robinson Summit

In this scenario the SWIP Ely to Delta segment would utilize the Cutoff Route. The least-impact Cutoff Route could be constructed to the North Steptoe Substation siting area and then southwest to the Robinson Summit Substation site (refer to Figure 3-2). This route would not require a substation at the North Steptoe site but would allow a potential interconnection of the Ely to Delta segment with the Midpoint to Dry Lake segment at Robinson Summit. In this scenario there would be two lines from North Steptoe to Robinson Summit.

If the environmental impacts would be assumed to be similar on the Cutoff and the 230 kilovolt (kV) Corridor Routes, as described on page 2-53 of the SWIP Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA), then the environmental impacts would be incrementally higher between North Steptoe and Robinson Summit because of the second line. The 230kV Corridor Route would then become the Environmentally Preferred Alternative.

If the White Pine Power Project (WPPP) is constructed there would be one additional line built from the North Steptoe area to Robinson Summit and two additional lines south from there. Neither the Midpoint to Dry Lake segment nor the Ely to Delta segment would necessarily interconnect at the WPPP, however, all three lines could be interconnected at Robinson Summit.

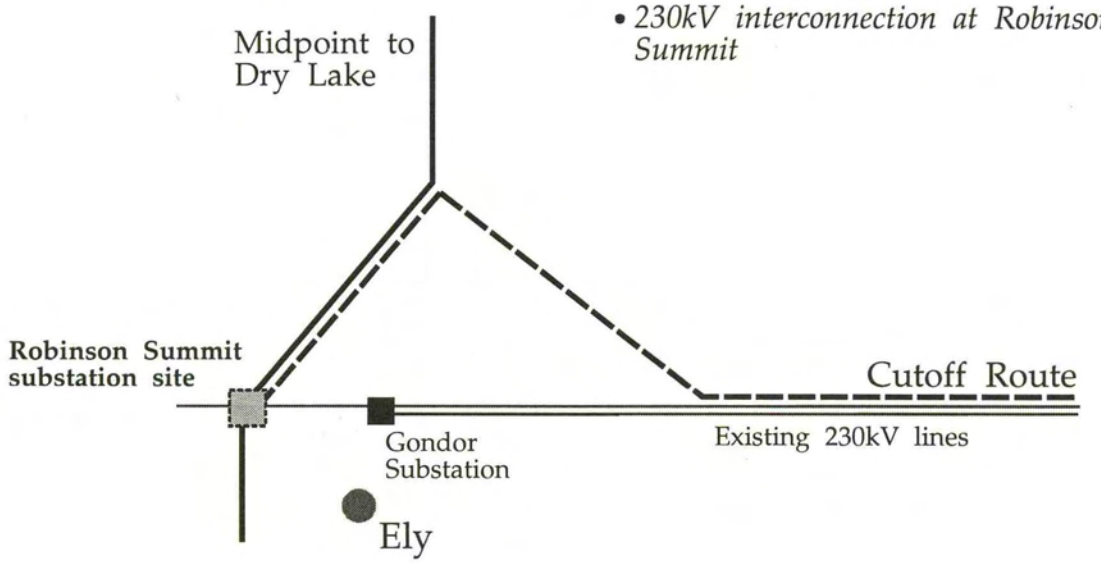
Scenario 2 - Cutoff Route to North Steptoe Substation

In this scenario the Cutoff Route would be constructed for the Ely to Delta segment and the marketplace substation would be constructed at North Steptoe. Then a 230kV line would need to be constructed from the Gondor Substation to North Steptoe to provide the future the SWIP interconnection with the 230kV system (refer to Figure 3-3). This would likely result in a 230kV line from Gondor Substation to the Robinson Summit area then paralleling the SWIP line to North Steptoe. This scenario would result in impacts similar to the Cutoff Route to Robinson Summit scenario (see above). If the 230kV interconnection occurred, again the 230kV Corridor Route would be environmentally preferred over the Cutoff Route.

If the WPPP is constructed, there could be four lines from North Steptoe to the Robinson Summit area (3-500kV lines and 1-230kV line), then 3-500kV lines south from Robinson Summit. This scenario would result in the most cumulative impacts of all of the scenarios. The only advantage of this scenario over the Cutoff Route to North Steptoe/Robinson Summit scenario (above) is that only one substation site would be needed.

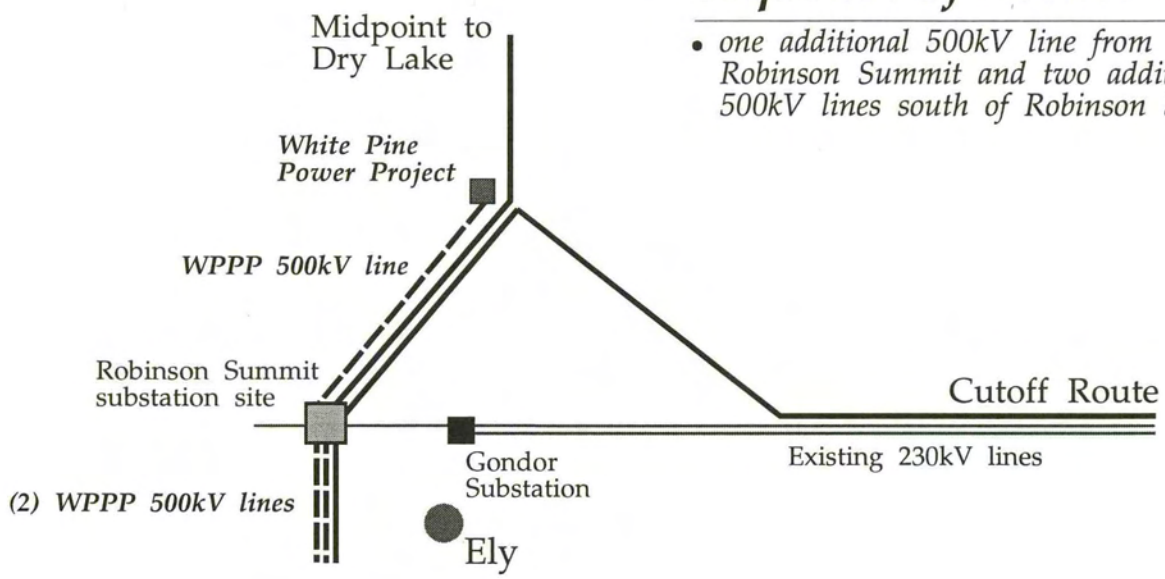
Sequence of Events

- *500kV connection of the Cutoff Route at Robinson Summit*
- *230kV interconnection at Robinson Summit*



Sequence of Events

- *one additional 500kV line from WPPP to Robinson Summit and two additional 500kV lines south of Robinson Summit.*

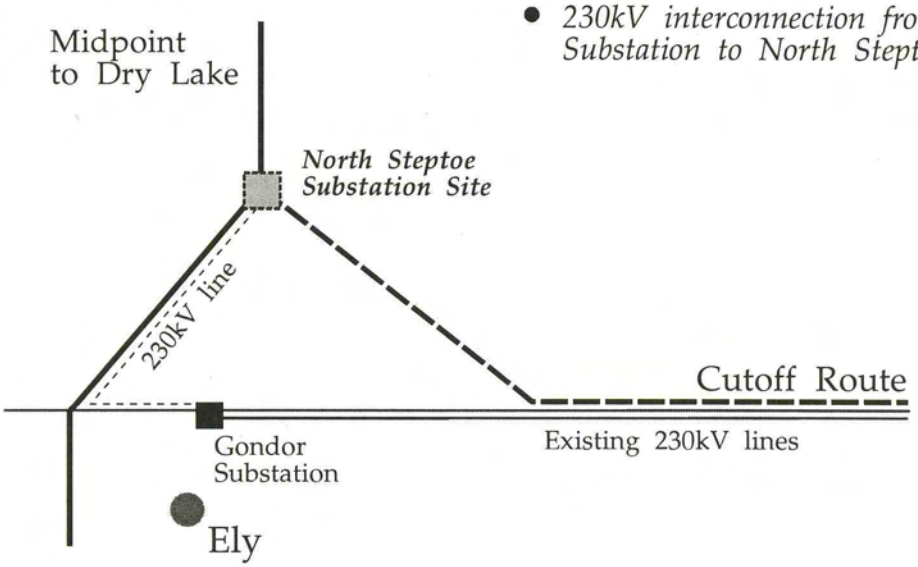


Scenerio 1
Cutoff Route to North Steptoe/Robinson Summit

Figure 3-2

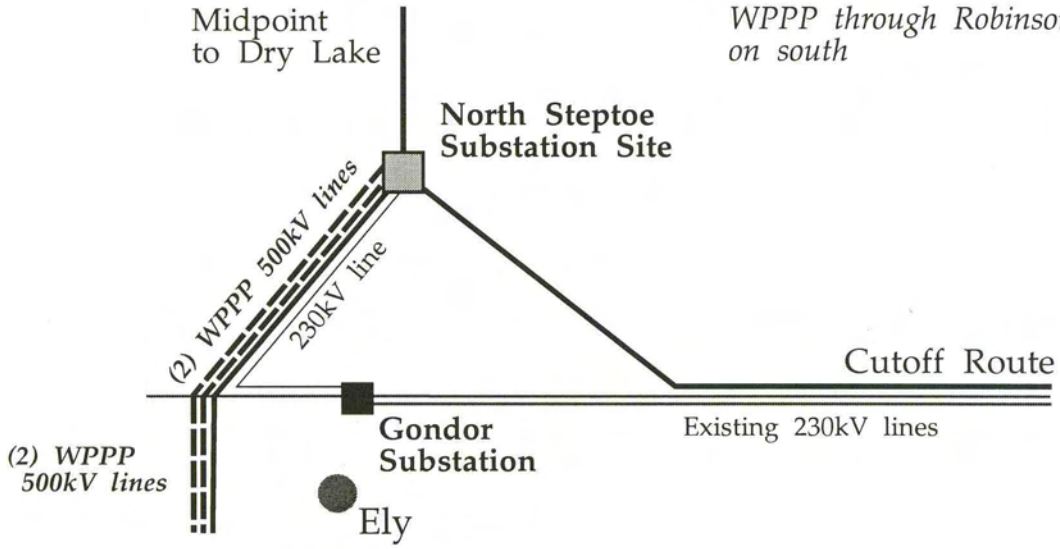
Sequence of Events

- *500kV connection of the Cutoff Route to North Steptoe.*
- *230kV interconnection from Gondor Substation to North Steptoe*



Sequence of Events

- *two additional 500kV lines from WPPP through Robinson Summit and on south*

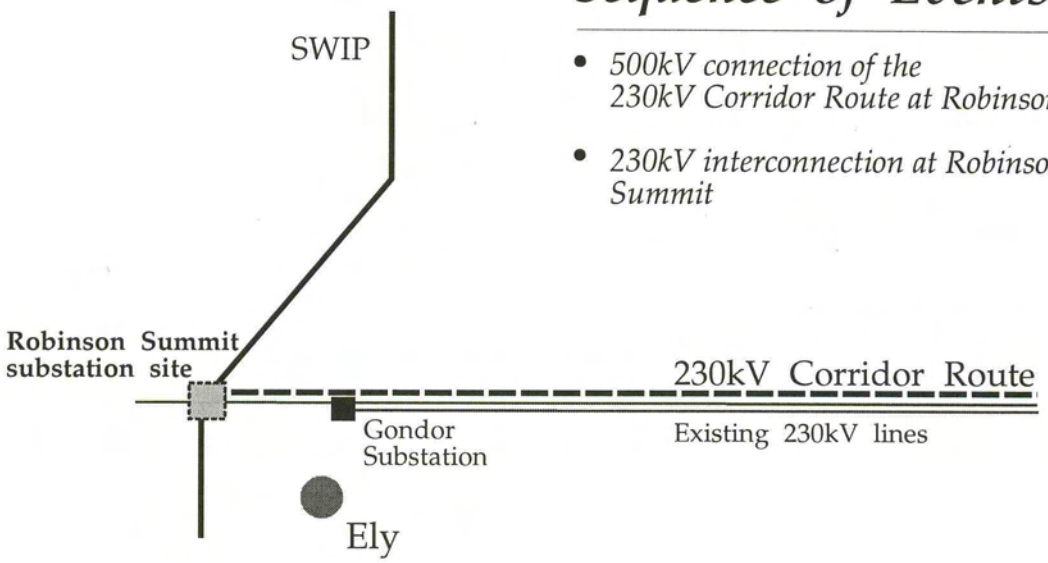


Scenerio 2
Cutoff Route to North Steptoe Substation

Figure 3-3

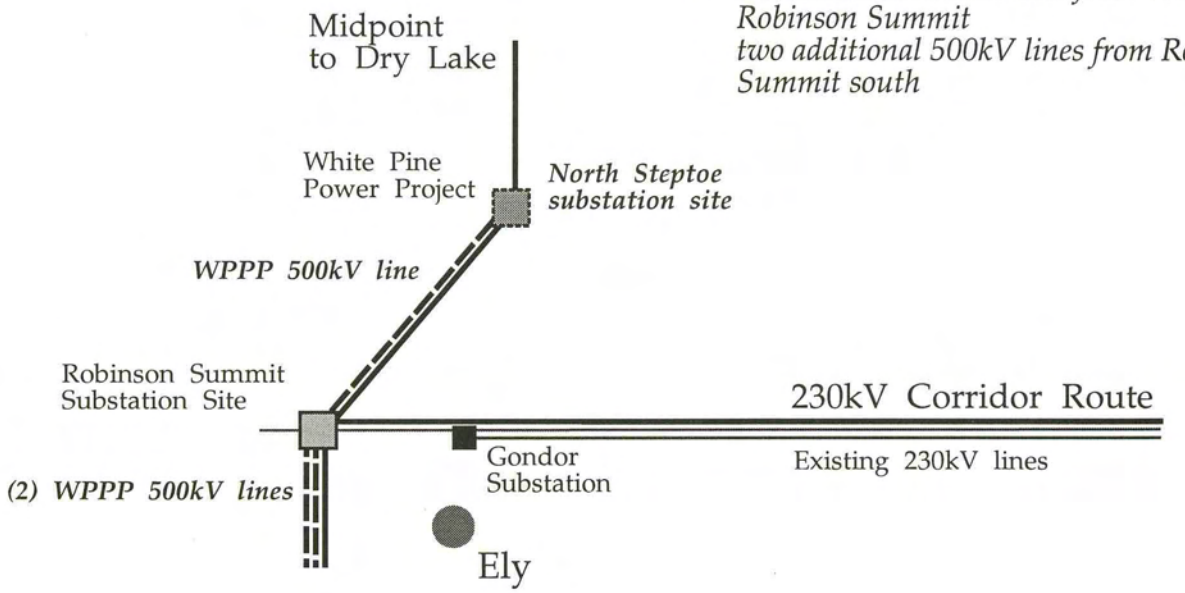
Sequence of Events

- *500kV connection of the 230kV Corridor Route at Robinson Summit*
- *230kV interconnection at Robinson Summit*



Sequence of Events

- *North Steptoe substation is constructed w/ WPPP and Midpoint to Dry Lake is interconnected.*
- *one additional 500kV line from WPPP to Robinson Summit*
  two additional 500kV lines from Robinson Summit south



Scenerio 3
230kV Corridor Route to Robinson Summit

Figure 3-4

Scenario 3 - 230kV Corridor Route to Robinson Summit

With this scenario the Ely to Delta segment would utilize the 230kV Corridor Route and the substation would be constructed at Robinson Summit where the interconnection with the 230kV system could occur (refer to Figure 3-4). If the 230kV interconnection were to occur, this scenario would have the least cumulative impacts to this point in the "buildout".

If the WPPP is constructed, the SWIP could interconnect at the North Steptoe area (at WPPP), one new 500kV line would be constructed from WPPP to Robinson Summit and two new 500kV lines would be constructed south of there. If the WPPP were constructed this scenario would cause the least cumulative environmental impacts.

Environmental Comparison of the Scenarios

The following table illustrates the environmental preferences of the expected future utility development in the Ely area.

Summary of Cumulative Effects
Environmental Preference in the Ely Area

	SWIP (Midpoint to Dry Lake and the Crosstie)	**230kV Interconnection**	**White Pine Power Project**
Scenario 1			
Scenario 2			
Scenario 3			

Environmental Preference

- **Most Preferred**
- **Second-Most Preferred**
- **Least Preferred**

The Marketplace-Allen Transmission Project

The proposed substation in the Dry Lake area would be the southern terminus of the SWIP. In 1990 the BLM asked the Idaho Power Company (IPCo) to help coordinate the transmission needs of utility companies with new transmission facilities planned in southern Nevada, particularly those needing transmission access to the McCullough Substation area located south of Boulder City, Nevada. The regional utilities developed a corridor concept which would maximize the capacity of the corridor while minimizing environmental impacts. Subsequent discussions with the Nevada Power Company (NPC) and other utilities resulted in the Marketplace-Allen Transmission Project (MAT) project, which is planned to be proposed to the Nevada Public Utility Commission in July 1993 by NPC. This approximately 53 mile project would connect the proposed SWIP substation in the Dry Lake area to a new marketplace substation in the McCullough Substation area. Two high capacity 500kV transmission lines would connect the two substations of the "open marketplace". The combined capacity of over 3000 megawatts (MW) would allow utilities to interconnect at either substation and conduct transactions.

Although the MAT would be operated by NPC, several other regional utilities would likely be participants in the project. The purpose and need for the MAT would be to provide a major electrical interconnection point for the Inland Southwest, with connection points on its north end (i.e., the proposed Dry Lake Substation site) and south end (i.e., the proposed marketplace substation near McCullough Substation). This project would also provide capacity for NPC's internal system needs. The combined capacity rating of over 3000 MW would be possible because of the relatively short distance between the two proposed marketplace substations. The high capacity of this system would allow the planned transmission lines to connect on either end, while minimizing the number of lines through this sensitive area. The MAT is proposed to be in service in 1997.

There are two major potential routing alternatives for this project. The first would run straight south through the Apex development parallel to the proposed Utah-Nevada Transmission Project 500kV line, then cutting southeast to the Gypsum Wash area, and then south through the Sunrise Mountain and Henderson areas. The second major routing alternative would cross Interstate 15 at the north end of the Dry Lake range and run straight south paralleling the Intermountain Power Project (IPP)-Adelanto 500kV Direct Current (DC) line and the Navajo-McCullough 500kV line to the Sunrise Mountain and Henderson areas.

The SWIP's southern connection to the proposed Dry Lake Substation would require an interconnection with the proposed marketplace substation. The Notice to Proceed for the construction of the SWIP, from Ely to Dry Lake, would be contingent on the approval of a transmission facility between the Dry Lake Substation and the proposed marketplace substation. The Marketplace-Allen Transmission Project (MAT) has been proposed by Nevada Power Company to meet this and other interconnection needs.

The SWIP may be built in phases if market or financial conditions warrant. The portion of the SWIP from Midpoint Substation to Ely (Midpoint to Dry Lake segment) may be the first phase developed.

Also refer to the Cumulative Effects section in Chapter 4 of the SWIP DEIS/DPA.

Potential Fiber Optic Ground Wire

To protect conductors from direct lightning strikes, two overhead ground wires, 3/8 to 1/2 inch in diameter, would be installed on the top of the towers. Electrical current from lightning strikes would be transferred through the ground wires and structures into the ground. There is an opportunity to install ground wire with fiber optic capability to serve the needs of commercial communication companies rather than traditional ground wire. Further, the fiber optic ground wire could also be used to supplement the communication needs of the SWIP. However, the planned microwave communication system would be the primary communication system.

If installed, access to the fiber optic ground wire by a commercial communications company would only be allowed upon completion of all environmental permitting activities (e.g., NEPA) and obtaining the right-of-way. Regeneration stations, which are typically small concrete buildings approximately 10 feet by 10 feet, would be needed at 20-40 mile intervals along the transmission line right-of-way. They would likely be placed on or immediately adjacent to the SWIP right-of-way.

Similar to the conductors, ground wire would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment as shown on Figure 2-5 in the SWIP DEIS/DPA. Sites for tensioning equipment and pulling equipment would be approximately 2 miles apart. If a fiber optic ground wire is installed rather than conventional ground wire, the construction methods would be the same. The appearance of a fiber optic ground wire is the same as conventional ground wire. The regeneration stations would likely cause insignificant visual impacts.

ADDITIONAL STUDIES AND INFORMATION

Analysis of the No-Action Alternative

Information and analysis about the No-Action Alternative is presented here as a supplement to the section analyzing the No-Action Alternative in Chapter 2 of the SWIP DEIS/DPA on pages 2-10 and 2-11. Within this section the potential impacts associated with No-Action are assessed.

Biology

Selection of the No-Action alternative would have the effect of creating no project related impacts to biological resources in the States of Idaho, Nevada, or Utah. Impacts that would not occur under this alternative are varied and include short and long term losses of habitat to a wide array of wildlife species resulting from construction roads and disturbance at tower sites and ancillary facilities (e.g., line pulling and tensioning sites and equipment storage yards). In addition to short term impacts to wildlife, some populations of rare plant species would not be affected under this alternative.

Long term impacts, both direct and indirect, that would be avoided under the No-Action alternative include permanent commitment of small amounts of wildlife and plant habitat to transmission line tower footings, potentially increased OHV use along transmission line roads (even after closure of such roads), a potential for limited bird mortality resulting from collisions with conductors and static lines, and creation of hunting or nesting sites for predatory bird species.

In southern Nevada, the federally listed desert tortoise would suffer no direct impacts from short or long term disturbance of habitat, no permanent loss of habitat to transmission line tower footings, and no harassment, injury, or mortality from construction-related activity. Potential indirect benefits of this alternative include no project-associated, unintended, increases in public access to tortoise habitat or from activities associated with operation and maintenance of the transmission line. Impacts from increases in public access could include further habitat degradation from unauthorized off-road vehicle activity, direct mortality from tortoises being crushed by vehicles, increased mortality from vandalism (e.g., shooting of tortoises), and increased illegal collecting of tortoises for pets.

In northern Nevada, and to some extent, southern Idaho, the No-Action alternative would provide both direct and indirect benefits to local populations of sage grouse. Although it is likely that direct impacts to crucial sage grouse wintering and strutting areas can be avoided by judicious tower placement, there may be some impact to these habitat features. The primary indirect benefit to sage grouse from this alternative would be that transmission line towers would not be present to provide hunting perches for golden eagles, or other birds such as ravens, to prey on sage grouse during particularly vulnerable segments of their life cycle.

The No-Action alternative may also result in indirect benefit to big game species. In the absence of the project, individual pronghorn antelope, mule deer, bighorn sheep, and elk may realize net benefits through no increases in the potential for human access to habitat areas used by these species at various times of the year. However, the No-Action alternative may not result in measurable benefit to regional populations of these species.

The No-Action alternative may also result in no net benefit accruing to some species and result in a scenario that is reflected by the currently existing environment. The introduction of transmission line towers into some areas may provide nesting and hunting sites for some species (e.g., some species of hawks) where none currently exist. Conversely, the No-Action alternative may be of benefit to individual birds of prey inasmuch as perched birds and nests on transmission line towers are highly visible, making them more vulnerable to illegal shooting by humans.

Some particularly sensitive habitats and the wildlife and plants that occur there (e.g., the Leland Harris spring complex in Juab County, Utah) may realize beneficial indirect effects from this alternative. In the case of the Leland Harris springs, most notable would be the absence of any project related impacts to the springs and wetlands associated with them. Secondary, indirect beneficial impact may accrue to this area by virtue of the entire planning process for this project, which has brought heightened attention to the degraded nature of the existing environment at this sensitive site.

Cultural Resources

The No-Action Alternative would result in continued management of cultural resources in accordance with current agency programs. No intensive surveys would be undertaken along an approved construction corridor and most of the estimated 200 to 400 cultural resources likely to be present probably would not be discovered and recorded in the near future. None of these resources would be affected by the transmission line construction activities, nor would the setting of these resources be altered by introduction of a new transmission line. No archaeological or historical studies would be undertaken nor would other types of measures be implemented to mitigate the impacts of constructing the proposed transmission line. The public accessibility of the region would not be enhanced by construction of access roads and therefore cultural resources are unlikely to be threatened by increased vandalism or inadvertent damage as a result of more visitation.

The No-Action Alternative would be similar to the Existing Environment (refer to Chapter 3 of the SWIP DEIS/DPA.

Visual Resources

The No-Action Alternative would not alter the Visual Resources beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Land Uses

The No-Action Alternative would not affect present land uses as described in the existing environment in Chapter 3 of the SWIP DEIS/DPA.

Soils/Geology/Paleontology

The No-Action Alternative would not alter the Soils/Geology/Paleontology beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Recreation Resources

The No-Action Alternative would not create any additional recreation access beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Wilderness/WSAs

The No-Action Alternative would not alter the Wilderness/WSAs beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Electric and Magnetic Field Effects

The No-Action Alternative would not alter the Electric and Magnetic Field Effects beyond that already described in the existing environment. Refer to Table 4-5 and 4-6 in the SWIP DEIS/DPA for a comparison of Electric and Magnetic Field Effects that currently exist with Electric and Magnetic Field Effects that would exist if the SWIP were constructed, also refer to Chapter 3 of the SWIP DEIS/DPA.

Socioeconomics

With the No-Action Alternative the cost of power may be increased within the western U.S. over time because of the inability for the utilities to implement least-cost planning alternatives (i.e., the SWIP). The tax bases of the counties under the No-Action Alternative would be the same as the existing environment, refer to Table 4-4 in the SWIP DEIS/DPA and Chapter 4 page 4-14 of the SWIP FEIS/PPA for a description of estimated county tax revenues that would be foregone by county residents if the SWIP is not constructed (refer to Chapter 3 of the SWIP DEIS/DPA).

Grazing

For grazing lessees the No-Action Alternative would be an adverse impact because of less access for rangeland purposes. It would also be a beneficial impact to the lessee because the No-Action Alternative would also provide less access onto rangeland by the public, and therefore less disruption to grazing operations, less chance of vandalism, and less chance of harassment of domestic livestock.

Recent EMF Research Results

Additional information has been provided on electromagnetic field (EMF) research which has been published since the SWIP Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA). For a complete discussion of EMFs, please refer to the Chapters 3 and 4 of the SWIP DEIS/DPA.

In September 1992, two Swedish residential and occupational EMF studies were released. One case-control study investigated cancer in both children and adults living near high voltage transmission lines in Sweden during a 25-year period. The Swedish researchers found a weak association between historical EMF exposure and leukemia in children, but could find no evidence of an increased risk for adults. The occupational study's results showed a modest association for both leukemia and brain tumors in adults who had occupational exposures to EMFs. The researchers concluded that the results of the studies provide some support for an association between EMF and cancer development.

In October 1992, the Danish Cancer Registry released preliminary results from their own EMF studies. They paralleled their Swedish colleagues with one childhood and one occupational study. Their findings, however, did not support those of the Swedish study. For childhood leukemia, the Danish study results do not support a conclusion of an elevated risk from EMF exposure. Nor was a leukemia exposure-response trend evident. The occupational study, on the other hand, reports an increased risk of leukemia in working adults exposed to continuously elevated EMFs. The reason for this increase is not clear. In addition to magnetic fields, other factors may also be present in the work environment.

The Electric Power Research Institute (EPRI) has analyzed the Swedish studies and finds that they contain important new information and innovative measurement techniques that better identify the exposure variables. The Swedish studies are also consistent with other studies that have found a correlation. However, there are weaknesses. In the residential study, there was a relatively small number of cases that estimated the leukemia risk, making it difficult to draw statistically significant conclusions. Additionally, the long term exposure tracked over the 25 year period necessitated estimations that did not take into account possible exposures from other sources. The Swedish occupational study, however, did adjust for exposures to various other environmental factors. The Edison Electrical Institute (EEI) also notes that although the studies were credible and thoroughly researched, they were incomplete and showed no definite link between EMFs and cancer.

Right-of-Way

Right-of-Way Width Requirement and Grounding

A right-of-way width of 200 feet is required to accommodate the conductor blowout (i.e., swinging of the conductor midway between towers) due to wind, guy wires and anchors, and maintenance clearances at the tower sites. All power lines produce EMFs. These fields produce static charges on conductive objects within a certain distance from the line. The amount of charge depends on the conductive object's size, shape, and orientation to the line. These static charges can be eliminated by either using nonconductive materials or by grounding the conductive objects that would be of sufficient size to produce a charge. Buildings or structures with conductive surfaces located outside of the right-of-way, but within 200 feet of the assumed centerline, would be grounded. Buildings or

structures beyond 200 feet would be reviewed in accordance with the National Electric Safety Code (NESC) to determine grounding requirements.

The NESC requires grounding "as one of the means of safeguarding employees and the public from injury that may be caused by electric potential." The grounding standards of the Idaho Power Company (IPCo) exceed the NESC requirements. IPCo grounds all buildings, fences, and other structures with metal surfaces located within 200 feet of the assumed centerline of transmission lines. Typically, residential buildings located 200 feet outside the assumed centerline would not require grounding. The IPCo also grounds all metal irrigation systems that parallel a transmission lines for distances of 1000 feet or more within 100 feet of the assumed centerline. If grounding is required outside the right-of-way, a temporary use permit or landowner consent would be obtained as necessary. Grounding of fences, buildings and other structures would be fully detailed in the SWIP Construction, Operation, and Maintenance (COM) Plan.

Right-of-Way Separation between the SWIP and the UNTP

Where the SWIP would parallel the proposed Utah-Nevada Transmission Project (UNTP), the rights-of-way of the two transmission systems would need sufficient separation to meet reliability and outage criteria of the Western States Coordinating Council (WSCC) (also refer to the transmission system reliability section in the updated Purpose and Need in this chapter and to page 1-2 of the SWIP DEIS/DPA). Without adequate separation the criteria considers the simultaneous outage of the SWIP and the UNTP to be a credible event or an event that has a significant likelihood of occurring. The simultaneous loss of the SWIP and the UNTP under heavy transfer conditions could precipitate a major electrical system disturbance resulting in a cascading failure of the western power system. Building and operating the system in this manner would be inconsistent with the WSCC reliability criteria.

The projects must (1) reduce capacity (which has the effect of rendering one project economically impractical), (2) provide measures to avert system breakup (considered technically and economically impractical), or (3) construct the projects so a simultaneous outage is not credible (e.g., use adequate circuit separation). While the latter course is preferable to the project participants, the specific amount of separation required to achieve this determination has not been defined in the criteria. However, based on the terrain and environmental considerations in the area of parallel right-of-way, it is believed that 2,000 feet would be adequate.

Each right-of-way evaluation or request within the WSCC system should consider the specific line combinations to determine whether a specific separation is required. The issue is the credibility of a simultaneous loss of the circuits involved. The WSCC criteria state:

> "the credibility of loss of a particular set of lines will depend upon the total distance of common corridor shared by the lines and upon the vulnerability of the circuits over that distance to a common mode failure. Considerations for this vulnerability assessment will include line design, length, location, whether forested, agricultural, mountainous, etc., outage history, operational guides, and separation. For example, some utilities use separation by more than the span length as adequate to designate the circuits as being in separate corridors."

This issue is not new. For example, the Third Pacific 500kV AC Intertie requested and received miles of separation between it and the existing two 500kV interties in forested areas. This separation was

required to allow adequate response time to adjust the system following the loss of the existing lines and a potential loss of the third 500kV line. Similar to the SWIP and the UNTP, the consequences of such an outage would be wide spread outages in the WSCC system. Without this separation, that project probably would not have been feasible.

The reason for separating the SWIP and the UNTP lines is to meet the WSCC reliability criteria for regional transmission facilities. Placing these lines closer together or on the same double circuit tower could result in a considerably lower capacity rating that would render the projects economically infeasible. The capacity rating of the SWIP line would not be permitted if the project developer does not comply with WSCC separation requirements.

Double circuit towers or a separation of less than 2,000 feet would exist in isolated areas along the route due to terrain or land use conflicts (e.g., Pahranagat Wash). These transmission towers would have to be designed with a safety factor that is several more times redundant than would be otherwise necessary. The project developer hopes that the WSCC would be willing to allow the 1200 MW rating with these design concessions for a short distance (i.e., less than 1 percent of the total line length).

The SWIP and the UNTP would converge near Robber's Roost Hills (Link 675 - milepost 12), and would be parallel for 88.5 miles (Links 690, 700, and 720 - milepost 15) into Coyote Spring Valley in southern Nevada, where the UNTP would continue south and the SWIP would cross through the southern end of the Arrow Canyon Range into the Dry Lake Valley. A separation of 2,000 feet would be needed for this entire distance except where it is not physically possible to maintain this separation.

In the Pahranagat Wash area, the SWIP and the UNTP lines may need to be closer than 2,000 feet for two miles or more. Because the Delamar Mountains and Evergreen Wilderness Study Areas (WSAs) are within about 1/2 mile of each other and other linear features are present (e.g., U.S. Highway 93 and the Lincoln County Coop 69kV line), the SWIP and the UNTP lines would each be constructed on double circuit towers, with one circuit left open. The plan is for the two future WPPP lines to be placed on the open circuits of the SWIP and the UNTP lines through this area. The proposed configuration of the planned lines through this area is shown schematically in the cross-sections included in the Map Volume accompanying the SWIP DEIS/DPA. To help compensate for this lack of separation and to meet the WSCC criteria outlined above, the structures within this area would need to be engineered to a higher standard to better withstand potential physical disturbances (e.g., earthquakes, etc.). Refer to Cumulative Effects section in Chapter 4 of the SWIP DEIS/DPA.

If the Delamar and Evergreen WSAs are not designated as Wilderness by Congress by the time all of the lines are constructed, the involved utilities may pursue amending the right-of-way grants to allow all of the lines to be placed on separate circuits.

In the 88.5 miles where the SWIP and the UNTP lines would be separated by 2,000 feet, the SWIP and the UNTP lines would form the outside edges of the utility corridor that would include the two planned 500kV WPPP transmission lines. The cross-sections in the Map Volume accompanying the SWIP DEIS/DPA schematically show the relationship of the four planned 500kV transmission facilities. Refer to the Cumulative Effects section in Chapter 4 of the SWIP DEIS/DPA. The involved regional utilities will coordinate with the Las Vegas District of the BLM on the final configuration of this corridor.

Where the SWIP would not parallel the UNTP line, a minimum separation of 200 feet from other transmission facilities, centerline to centerline, would be required (i.e., for some facilities the rights-of-way could be side by side). With this separation, if either the SWIP or the lower voltage line failed, neither would fall into the other.

Military Air Space

In a comment on the SWIP DEIS/DPA, the National Park Service (NPS) requested additional information about the significant potential impacts of the alternative routes on military airspace. This section describes Federal Aviation Administration (FAA) regulations and agreements, the Air Force's concerns for the SWIP alternative routes, and the potential impacts of each alternative route on flight operations and military airspace.

The SWIP would affect two of the largest flight training areas in the West: the Utah Testing and Training Range (UTTR) of Hill Air Force Base (AFB) and the Desert Military Operating Area of Nellis AFB. Each of these ranges have a series of military operating areas (MOAs) where a large variety of low-level flights are conducted for combat training maneuvers and exercises.

Flights in these areas are conducted under visual flight rules (VFR) to provide low-attitude navigation and radar-simulated combat exercises (FAA Order 7610.4, Special Military Operations). Because of the low-level high-speed nature of the flight operations in MOAs, surface structures (e.g., radio towers, transmission line towers, etc.) present significant potential danger to pilots and aircraft, particularly when altitude ceiling and visibility conditions are impaired. Although flight operations can be altered to avoid the potential hazards of transmission line facilities, the low-altitude training operations are a pre-existing use of the airspace (FAA Part 77, 7400.2C Procedures for Handling Airspace Matters, 1984). FAA procedures state that when proposed structures that exceed the obstruction standards are being sited and the military has determined the alternative would be detrimental to their flight operations, an attempt to persuade the project sponsor to lower or relocate the alternative should be identified by the military (7400.2C Procedures for Handling Airspace Matters, Chapter 7 - Evaluating Aeronautical Effect).

Military Operating Areas and Restricted Areas - The Military has negotiated agreements with the FAA to set aside special airspace areas to contain flight activities that, because of their nature, may impede other aircraft operations that are not part of those activities. These airspace areas, called MOAs and restricted areas, establish positive control area to separate certain non-hazardous military activities from instrument flight rules (IFR) traffic (e.g., conventional commercial aircraft) and to identify for VFR traffic (e.g., small aircraft) where these military activities are conducted (7400.2C Procedures for Handling Airspace Matters, May 1, 1984). Military activities can include air intercepts, supersonic flight, acrobatic maneuvers, air combat exercises, and other flight training. Restricted Areas and MOAs contain these activities and prevent non-participating aircraft from being affected or interfered with during military operations.

Military airspace is divided into two categories: those that involve rulemaking actions and those that involve non-rulemaking actions. Rulemaking actions relate to the assignment, review, modification, or revocation of airspace by a rule, regulation, or order as prescribed in the Federal Aviation Regulations (FAR Part 11). Restricted Areas fall into this category. Because an agreement between affected military units, FAA representatives, and jurisdictional owners or administrators (e.g., the BLM) is required, it is difficult to amend and/or change the operation plans in these areas. Non-rulemaking

areas include MOAs, firing areas, and alert areas where the FAA has the authority to make the final decision but does not render that decision by issuing a rule, regulation, or order (7400.2C Procedures for Handling Airspace Matters, May 1, 1984). The SWIP alternatives would pass through both categories of military airspace.

A letter of agreement between the controlling agency, the FAA, and the using agency, Hill AFB, is used to establish special airspace areas. This agreement regulates and coordinates military activities with other aircraft and private land owners and public land administrators. The controlling agency is the agency, organization, or military command whose activity the special airspace was established for when first designated.

The controlling agency will establish a MOA or restricted area as a non-joint use area, joint use area, or point source area. This designation allows the special airspace to be used or not used when all or part of the airspace is not required for its prescribed purpose or used for other purposes when missions are not taking place. To determine the useable limits of each, MOAs and restricted areas are described in terms of horizontal and (boundaries), vertical (altitudes) dimensions, the time it will be used (specified times and days of the week), and the types of activities or missions that will take place. Because of their small size, geographic location, or high degree of use, some areas are impractical for use all of the time or at all. These areas are usually termed as non-joint use. Areas that are used periodically may be termed joint use and areas that are used frequently, such as specific valleys, may be termed point source use.

Letters of agreement are signed as part of the negotiations between the controlling agency and the using agency. Agreements are necessary when military activity is to be designated below 1,200 feet above-ground-limit (AGL) and when the underlying land belongs to a private owner or is administered by a public agency other than the military. The agreements state reasonable and timely aerial access to such lands and grant the Air Force permission to fly missions over lands they do not administer. In order for the military to designate activities down to the ground surface, the proponent must either own, lease, or by letter of agreement control the underlying surface.

Affected Environment

All of the alternative routes for the Ely to Delta segment would affect restricted airspace or MOAs of the UTTR (Hill AFB) and all of the alternative routes for the Midpoint to Dry Lake segment would affect several MOAs operated by Nellis AFB.

Agreements - The are no signed letters of agreement between the BLM and the Department of Defense for the MOAs and restricted areas affected by the SWIP alternative routes. There are existing agreements between the BLM and FAA and the FAA and the Department of Defense. These agreements established the MOAs and restricted areas for Hill AFB in Utah and Nellis AFB in Nevada.

There are no regulations governing the allowed uses on the BLM-administered lands under a restricted areas or MOA. The BLM has jurisdictional rights and can permit a utility line under airspace administered by the military.

Hill Air Force Base Flight Operations - The UTTR of Hill AFB is located in northwestern Utah and extends across the state line into northeastern Nevada. The portions of MOAs in Nevada are used primarily for flight maneuvers and air combat training, as well as approaching and departing targets

located in the adjacent restricted areas of the UTTR (UTTR, 1988). Flight levels extend from 100 feet-AGL to 9,000 feet (6,500-feet Mean Sea Level (MSL). All supersonic flights are conducted under VFR during the daylight hours (U.S. Air Force, Hill AFB, 1985). Altitude floors for the Lucin A, Lucin B, Gandy, Sevier A, and Sevier B MOAs of the UTTR are set throughout at 100-feet AGL.

Hill AFB was contacted and notified of the SWIP alternative routes during the inventory. The airspace coordinator provided maps for locating Restricted Areas and MOAs and a letter expressing concerns about alternative study corridors. The portion(s) of the UTTR affected are described for each alternative route:

Delta Direct Route - This route would cross 19.5 miles in the Gandy MOA, 44.5 miles in the R-6405 Restricted Area, 12.8 miles in the Sevier A MOA, and 13.8 miles in the Sevier B MOA. Hill AFB stated that a route across the R-6405 Restricted Area would likely not be feasible. Areas of high concern were also identified along the portion of the Gandy MOA that would be affected by this route.

Cutoff Route - This route would cross 33.8 miles in the Gandy MOA, 62.5 miles in the Sevier A MOA, and 20 miles in Sevier B MOAs. Flight operations in these areas may occur down to 100-feet AGL in a joint use arena.

230kV Corridor Route - This route would cross 40.4 miles in the Sevier A MOA and 20 miles in the Sevier B MOA. Flight operations may occur in these areas down to 100-feet AGL in a joint use arena.

Southern Route - This route would cross 1.2 miles in the Sevier A MOA and 82 miles in the Sevier B MOA. Flight operations in these area may occur down to 100-feet AGL in a joint use arena.

The specific mileage of each alternative route in MOAs and Restricted Areas is listed in Table 3-1. Restricted Areas and MOAs are illustrated in the study corridors in blue and MOAs are illustrated in green on the Land Use Resources maps in the SWIP DEIS/DPA Map Volume.

As one of the largest flight training areas in the in the U.S., the UTTR is highly regarded as a valuable testing and training center and is considered very important by the Department of Defense, especially in light of the recent closing of military bases around the country by Congress.

Nellis Air Force Base Flight Operations - Nellis AFB operates several MOAs located in southern Nevada collectively called the Desert Military Operating Area. The FAA has authorized the Nellis Air Traffic Control Facility (NATCF) to govern this airspace. NATCF controls the entry and exit of military aircraft in their airspace while the Range Control Center monitors mission activities within the airspace.

Flight operations in the Desert Military Operating Area include high-speed low-level flight training maneuvers and supersonic flight exercises at or above 5,000-feet AGL. Operations may occur during daylight hours Monday-Saturday. The MOAs operated by Nellis AFB administer the airspace from the ground level to 55,000 feet.

Nellis AFB was contacted and notified of the SWIP alternative routes during the inventory. Nellis AFB is opposed to alternative routes through the White River Valley (Link 671), Dry Lake Valley

(Link 673), and Kane Springs Wash (Link 680) because of low-level flight activity and air to air intercepts exercises that occur in these areas.

In October 1990, Nellis AFB sent maps recommending specific route changes and tower height restrictions. Nellis AFB expressed a preference for a route that would turn east at a point south of the Wayne Kirch Wildlife Management Area across Cave Valley through a pass at the southern end of the Schell Creek Range (Link 672) then turning southeast across Muleshoe Valley (Link 674) toward the Bristol Range and south along the east side of Dry Lake Valley. This routing would begin paralleling the existing Lincoln County 69kV transmission line near Robber's Roost Hills (Link 675). The Caliente Resource Area of the Las Vegas District of the BLM agreed that the routing proposed by Nellis AFB should be studied. Subsequently, the described route segments were added (refer to the Panel 5 - Land Use Resources map in the SWIP DEIS/DPA Map Volume).

The individual MOAs affected by alternative routes include Reveille (Links 672, 673), Caliente West (Links 675, 690), Caliente Alpha (Link 690), and Sally Corridor (Link 690). Nellis AFB then identified "areas of high concern" along the alternative study corridors mapped during the inventory. These areas of high concern occur along portions of Links 671, 672, 673, 674, 675, 680, and 690.

The specific mileage of each alternative route in MOAs and Restricted Areas are listed in Table 3-1. Restricted Areas and MOAs are illustrated in the study corridors in blue and MOAs are illustrated in green on the Land Use Resources maps in the SWIP DEIS/DPA Map Volume.

Environment Consequences

The construction of the SWIP through military airspace in a Restricted Area or MOA would introduce a potentially hazardous obstruction across high-speed low-level flights routes used by aircraft approaching or departing targets. The Air Force has stated that maintaining their current operations with such an obstruction in the area would risk pilots and aircraft unless many low-level flight maneuvers were curtailed or otherwise altered.

The potential impacts of alternative routes on flight operations in Restricted Areas and MOAs is described below. All moderate residual impacts are considered significant.

Midpoint to Dry Lake Segment - All of the alternative routes for the Midpoint to Dry Lake segment would adversely effect MOAs operated by Nellis AFB. Alternative routes would pass through 64.7 miles of areas of high concern in the Desert Military Operating Area. To reduce the potential hazard of the transmission line towers, the AGLs of the affected MOAs would have to be raised to 200 feet. Changing the AGLs would require modifications to flight operations (e.g., exercises, flight routes, etc.) and potentially change the use designation (e.g., non-joint, joint, or point source use) of affected MOAs. Curtailed or altered flight operations could diminish the effectiveness of flight training exercises available in the Desert Military Operating Area.

The use of shorter towers was recommended as mitigation to reduce moderate initial impacts to low residual impacts. The potential application of this mitigation was negotiated with the airspace manager of Nellis AFB. However, there is no agreement with Nellis AFB to accept this mitigation. Nellis AFB did not submit comments on the SWIP DEIS/DPA.

Ely to Delta Routes - The Direct Route would result in 55.1 miles of moderate residual impacts where it would pass through the R-6405 Restricted Area operated by Hill AFB. Following a series of

meetings and correspondence, Hill AFB's airspace coordinator submitted a letter (May 22, 1991) stating the position of Hill AFB and the concerns of the Department of the Air Force regarding the four Ely to Delta routes. Hill AFB is opposed to any power line construction above 30 feet in height in the Restricted Area or would prefer the transmission line be buried. The letter cited that safety was of high concern above and below the test and training aircraft.

The other Ely to Delta routes would affect only MOAs. Hill AFB is opposed to towers above 105 feet in areas of high concern and above 154 feet in all other areas of the affected MOAs. Shorter towers (i.e., 105 feet) were recommended as mitigation within the areas of high concern following negotiations with the Hill AFB airspace coordinator. The locations of shorter towers are illustrated on Figure 3-5. Hill AFB agreed in a letter that shorter towers would be acceptable in the MOAs.

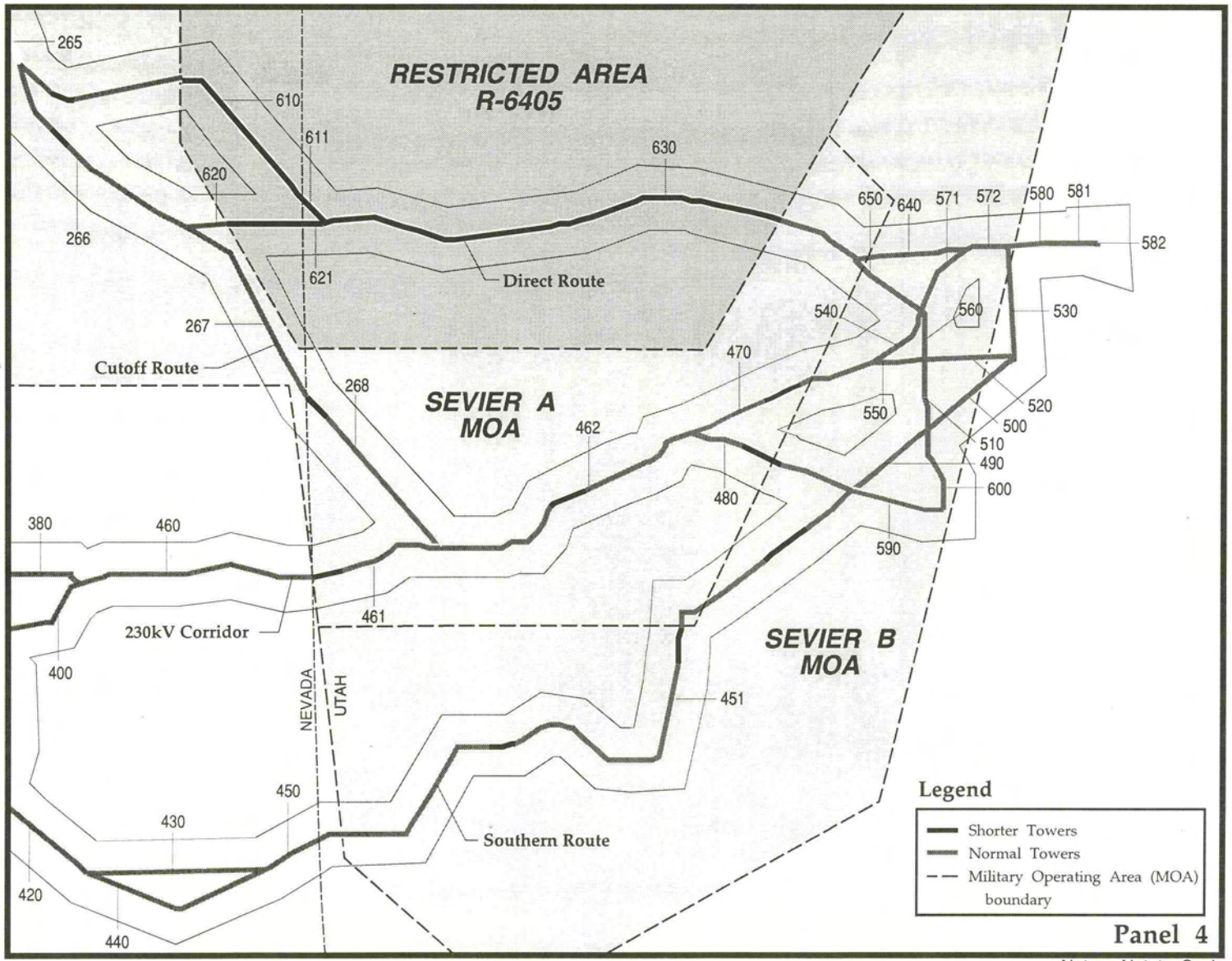
Effects to Wilderness Areas, Wilderness Study Areas, and Instant Study Areas

No wilderness areas, Wilderness Study Areas (WSAs), or instant study areas (ISAs) would be directly affected by any of the alternative routes. None of the alternative routes is expected to adversely affect the natural integrity, apparent naturalness, opportunities for solitude, or primitive recreation opportunities of wilderness or WSAs. The primary issue of concern for these areas is the potential effects (indirect) of a transmission line on the visual resource of adjacent areas.

As described under Visual Resources in the SWIP DEIS/DPA, viewpoints were identified and mapped within 3 miles of the assumed centerline of each alternative study corridor (i.e., link). No specific viewpoints (e.g., trail, vista, etc.) were identified within wilderness, WSAs, or ISAs during the inventory. Because recreation use in wilderness areas, WSAs, and ISAs is generally dispersed, views may occur from an indefinite number of potential viewpoints. And since none of these areas that fall within the study corridors have any designated viewpoints or management plans, it is not possible to estimate specific visual impacts.

Buffer zones around wilderness areas are specifically addressed in Chapter I of the BLM Handbook H-8560-1, Management of Designated Wilderness Areas under Section A.1.b. which states, "Wilderness must be viewed in context with other public lands, recognizing that no buffer zones will be created. Construction of high standard roads, recreation facilities or developments adjacent to a wilderness should consider the effect they will have on the wilderness." It further states that non-wilderness activities or uses that can be seen or heard from areas within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area (BLM, 1983). However, the handbook also states that effects of adjacent activities or land uses outside of wilderness areas should be identified. This policy also applies to WSAs and ISAs because the BLM must manage these areas as wilderness in accordance with the Interim Management Policy and Guidelines for Lands Under Wilderness Review (BLM document H-8550-1). If Congress designates them wilderness, the Interim Management Policy would cease to apply. Areas not designated as wilderness would be returned to multiple use in accordance with existing BLM planning documents. Since WSAs and ISAs are being managed as potential wilderness, impacts to these areas from influences outside of their boundaries must also be assessed.

Based on direction from the BLM Handbook and the BLM's Nevada State Director, potential effects of the alternative routes to dispersed viewpoints in wilderness areas, WSAs, and ISAs were addressed. Because it is not possible to assess specific impacts to dispersed viewpoints that could potentially



Note: Not to Scale

Locations of Shorter Towers in Utah Testing and Training Range

Figure 3-5

occur anywhere within these areas, potential effects considered the general viewing conditions (e.g., distance zone, view orientation, existing visual conditions - dominant or subordinate, etc.) and the visual contrasts of each alternative route.

Potential Effects

The project study area in Nevada and Utah is part of the Basin and Range physiographic province. Wilderness areas and WSAs in this physiographic province are generally associated with the mountain ranges, with one notable exception, Lower Salmon Falls Creek WSA in southern Idaho. Because of this tendency, views from wilderness areas and WSAs typically look out over large basins towards distant mountain ranges. Views can easily range beyond 30 miles under clear conditions.

The SWIP would likely tend to dominate views when seen from less than one-half mile away depending on specific viewing conditions (e.g., screening, viewer position and orientation, time of day, etc.). Because steel-lattice towers are proposed, it is expected that the transmission line would quickly become less visually evident with increasing distance from the viewer. In context with the grand scale of Basin and Range landscapes, the SWIP would be subordinate.

Because most of the landscapes surrounding wilderness areas and WSAs would be viewed from a superior position (i.e., looking down or over) in mountainous topography, most dispersed recreation users would likely tend to overlook the SWIP as they viewed the landscapes beyond (i.e., vast basins and rugged mountains) and the transmission line would be "backdropped" by the landscape. This viewing position would tend to make visual intrusions less evident and subordinate in the landscape. In a few cases, the SWIP may be viewed from an inferior position (i.e., looking up) which would tend to accentuate visibility, especially where it would be viewed against the sky or the horizon (skylined).

Under certain lighting conditions, the SWIP may be visible at greater distances because of the light reflected from towers and conductors. The use of dulled towers and non-specular conductors would be expected to largely mitigate this effect.

Mitigation The selectively committed mitigation measures (#9 and #10 in Table 1-5) were recommended to minimize potential adverse visual impacts of the SWIP. Mitigation was recommended based on the distance of the alternative routes from the boundaries of wilderness areas and WSAs:

- 0 to 1 mile — dulled towers and non-specular conductor
- 1 to 3 miles — non-specular conductor

This section describes the characteristic views and visibility of alternative routes for each wilderness area and WSA, and documents the potential effects of each alternative route on visual resources of these areas. The locations of wilderness areas and WSAs are illustrated on the Land Use Resources maps in the SWIP DEIS/DPA Map Volume. Tables 3-2 and 3-3 show, by wilderness area and WSA, the mileage of each alternative route that would pass within 0 - 1/4 mile, 1/4 - 1 mile, and 1 - 3 miles of their boundaries.

Idaho

Lower Salmon Falls Creek WSA - This WSA is the portion of Lower Salmon Falls Creek from Salmon Falls Creek Reservoir to Balanced Rock State Park. Because viewers in this WSA would be in the canyon, none of the alternative routes would be visible. Route F would parallel the existing Upper Salmon to Wells 138kV transmission line along the east boundary of this WSA and would be openly visible to viewers on the west rim of the canyon.

Nevada

Mt. Moriah Wilderness - This wilderness is situated 30 miles east of Ely near the Nevada-Utah state line within the boundaries of the Humboldt National Forest. Although the Cutoff Route (Link 267) would be visible for some distance to views northeast and east from this wilderness, it would be a subordinate feature in the vast open landscape of the Snake Valley. The 230kV Corridor Route (Link 464, 469, 471) would also be visible to some middleground and background views from this wilderness in the Sacramento Pass area (also refer to the Sacramento Pass Mitigation Reroute section in Chapter 3 of this document).

South Pequop WSA - This WSA is located in southern half of the Pequop Mountains in southeastern Elko County. With the exception of the Union Pacific Railroad and a few unpaved roads in Independence Valley and Goshute Valley, views from this WSA are of largely undisturbed natural landscapes.

Routes A, C, F, and G would be visible in the middle of Goshute Valley from 1 to 3 miles where these routes would parallel the Nevada Northern Railroad (Links 212, 230). From viewing positions in the northeast and east portion of this WSA, most of these routes would be backdropped by the Goshute Mountains east across the valley and would be visually subordinate to the landscape. Route D would tend to dominate views north where this route would pass within 1/4 mile of the boundary of this WSA at the railroad tunnel (Link 190) in the Pequop Mountains.

Bluebell WSA - This WSA is located in the northern part of the Goshute Mountain Range approximately 10 miles southwest of Wendover, Nevada. The landscape of this WSA is dominated by steep, mountainous topography with numerous canyons radiating along a north-south trending mountain range.

Routes B and E would pass north and east of this WSA and would be openly visible in Pilot Creek Valley (Link 222). From the northern portion of this WSA, views include Interstate 80 and several unpaved roads in the valley with occasional long-distance views of the salt flats beyond Wendover, Nevada. Views east, from north of Clifside to as far south as Felt Wash, include U.S. Highway 93 Alternate and unpaved access roads.

Routes D and E would dominate views where these routes would pass within 1/4 mile of the WSA for 2.4 miles. Routes A, C, F, and G would traverse in the center of Goshute Valley (5-6 miles away) parallel to the Nevada Northern Railroad and would be subordinate to views west from this WSA.

Goshute Peak - This WSA is located in the southern portion of the Goshute Mountain Range. Similar to Bluebell WSA, the landscape of this WSA is dominated by steep, mountainous topography with numerous canyons radiating from a north-south trending mountain range.

Routes B and E (Links 222, 225, 226) would be openly visible to views east and southeast from this WSA, except for a portion that may be screened by Ferguson Mountain. There are also distant views to the southwest of U.S. Highway 93. These routes would dominate views where they would be visible within one-quarter mile of this WSA (Link 226) for 1.3 miles and visible within 1/4 mile to 1 mile (Link 225, 226) for 3.4 miles.

Goshute Canyon - This WSA is located in the Cherry Creek Mountains from the Elko/White Pine county line to approximately 2 miles north of Cherry Creek. Views north are of the wide flat expanse of Steptoe Valley toward dark rugged forms of the Cherry Creek Range. The only apparent visual intrusions include U.S. Highway 93 on the far side of the valley, several two-track roads, and a series of seismic survey lines that cross the valley.

Routes D and G (Links 241, 242) would be largely subordinate views east from this WSA where they would be backdropped by the Shell Creek Range. Routes D and G may dominate some views across north Steptoe Valley from visitors to Goshute Cave where these routes would pass within 1 mile.

Marble Canyon WSA - This WSA is situated 30 miles northeast of Ely near the Nevada-Utah state line adjacent to the Mt. Moriah Wilderness in the Humboldt National Forest. Part of this WSA was included with the designation of the Mt. Moriah Wilderness. Although the Cutoff Route (Link 267) would be visible for some distance northeast and east from this WSA, it would be a subordinate feature in the vast open landscape of the Snake Valley. The Cutoff Route would be most noticeable along the lower portion of the alluvial benches that stretch from Marble Wash to Smith Creek Canyon within 1 to 2 miles of the east boundary of this WSA. Refer to Figure 4-5 in the Errata in Chapter 4 for the location of this WSA.

Swamp Cedar ISA - This ISA is located in Spring Valley several miles east of U.S. Highway 6/50. The 230kV Corridor Route (Link 380) is approximately one mile to the south of this area parallel to two existing 230kV transmission lines. Situated in the open valley, this route would be openly visible to middleground views. However, because of weaker structure contrasts associated with the existing transmission lines, the 230kV Corridor Route would not cause significant change in this landscape.

Mount Grafton WSA - This WSA is located on Mount Grafton approximately 30 miles southeast of Ely, Nevada, on the White Pine/Lincoln County line. The landscapes seen from the northern portion of this WSA are largely undisturbed, except for the Horse and Cattle Camp Backcountry Byway, an unpaved scenic route. The Southern Route would dominate views where it would pass adjacent to the northern boundary of this WSA. This route would be visible in Steptoe Valley (Link 364) from north of Mollys Nipples until it drops out of sight through numerous rock outcrops and scattered peaks north of Burnt Knoll Spring.

Fortification Range WSA - This WSA is located in Lincoln County between Lake Valley and Spring Valley just east of U.S. Highway 93. Only a very small portion of this WSA extends into the study corridor (Link 440). Only visitors to the northern part of the WSA would be affected by the Southern Route (Links 420, 430). Looking from mountain peaks above Indian Springs, viewers would see faint views of the SWIP where it would cross Spring Valley east towards Big Springs Wash. Views within the WSA to the west, south and far east would not be affected.

Delamar Mountains WSA - This WSA is located in the southern half of the Delamar Mountain Range east of the Pahranagat Wash Wildlife Refuge and Desert National Wildlife Refuge in Lincoln County. All of the alternative routes for the Midpoint to Dry Lake segment would use Link 690

which would traverse the base of these mountains along the west side of the WSA. The SWIP would be visible in the narrow valley formed by Pahranagat Wash.

When viewing north from this WSA, the SWIP would be seen for over 20 miles approaching across Delamar Valley parallel to the UNTP 500kV transmission line and the Lincoln County 69kV transmission line. All the routes would be visible along Link 690 where they would pass within one-quarter mile of the west boundary of this WSA for approximately 23 miles and would tend to dominate views west. However, because the SWIP would be parallel to two existing transmission lines, there would be only a slight incremental increase in the effect.

Evergreen WSA - This WSA is composed of three parcels of land, contiguous to the Desert National Wildlife Range (Link 690), located east of U.S. Highway 93 in the flat of Pahranagat Wash. All of the alternative routes for the Midpoint to Dry Lake segment would pass through the center of Pahranagat Wash adjacent to this WSA and parallel to U.S. Highway 93, the UNTP 500kV transmission line, and the Lincoln County 69kV transmission line (Link 690). Although backdropped by the Delamar Mountains, views from this relatively flat WSA would be dominated by the transmission lines and the highway in Pahranagat Wash. The addition of the SWIP would be a slight incremental increase in the visual effect of the existing lines and highway.

Fish and Wildlife 1, 2, & 3 WSA - Similar to the Evergreen WSA, this WSA is composed of three parcels of land contiguous to the Desert National Wildlife Range (Link 700, 720). All of the alternative routes for the Midpoint to Dry Lake segment would pass through the center of Coyote Spring Valley adjacent to this WSA and parallel to U.S. Highway 93, the UNTP 500kV transmission line, and the Lincoln County 69kV transmission line. Except for some views from points in the Elbow Range, the SWIP would be subordinate from this largely flat WSA. Parallel to two existing transmission lines and the highway in the middle of Coyote Springs Valley over one mile away, adding another transmission line would be a slight incremental increase in the visual effect.

Arrow Canyon WSA - This WSA is located in the Arrow Canyon Range, which rises abruptly along the east edge of Coyote Spring Valley (Link 720). All of the alternative routes for the Midpoint to Dry Lake segment would pass through Coyote Spring Valley below this WSA parallel to U.S. Highway 93, the UNTP 500kV transmission line, and the Lincoln County 69kV transmission line. From the southern portion of this WSA, views west would be dominated by transmission lines and the highway where the line would be within one-quarter mile of the east boundary for 4.3 miles. However, because the SWIP would be parallel to two existing transmission lines and the highway, there would be only a slight incremental increase in the visual effect. The SWIP would be subordinate in views west from the northern portion of this WSA.

Utah

Howell Peak WSA - This WSA is located north of Marjum Canyon in the Middle Range just south of the Swasey Mountains. The SWIP along the Cutoff Route or the 230kV Corridor Route (Links 462, 470) would dominate views south into the highly scenic and narrow Marjum Canyon, where these routes would parallel two existing 230kV transmission lines. From high points these routes would be visible to views southwest as they would cross Tule Valley, disappearing momentarily into Marjum Canyon and reappearing heading northeast across Whirlwind Valley.

King Top WSA - This WSA is located in the Confusion Range (Link 451). From the southern portion of this WSA, the Southern Route would be visible first where it would come around Pyramid

Knolls in the west. This route would dominate views along the southern boundary for approximately 3 miles. Knolls and hills west of the Confusion Range would screen some of the views of this route. Once past Warm Point the route would be screened by the Barn Hills. Views east from the northeast portion of this WSA would be of the Southern Route, where the route would parallel U.S. Highway 6/50 toward Sevier Lake.

Notch Peak WSA - This WSA is located in the House Range between U.S. Highway 6/50 on the south and Marjum Canyon on the north. Looking west viewers would first see the 230kV Corridor Route and the Cutoff Route (Link 462) across Tule Valley coming from Payton Canyon in the Confusion Range parallel to two existing 230kV transmission lines. From Pines Peak 3 miles north of Notch Peak, viewers would see the transmission line corridor continue from Tule Valley to south of Marjum Canyon. From the northern boundary, views would likely be dominated where the SWIP would pass through the highly scenic Marjum Canyon. Only viewers in the extreme northeast portion of the WSA would see these routes exit Marjum Canyon heading northeast across Whirlwind Valley.

From the southern portion of this WSA, viewers would see the Southern Route (Link 451) where it would traverse north across Tule Valley. The Southern Route would begin to dominate views south where it would turn northeast to parallel U.S. Highway 6/50 into the Sevier Desert.

Wah Wah Mountains WSA - This WSA is located in the Wah Wah Mountains north of Utah State Highway 21 (Link 451). Only a small portion of the northwest boundary of this WSA would view the Southern Route. At over 2.5 miles away, the Southern Route would be subordinate in the landscape.

Fish Springs WSA - This WSA is located in Fish Springs Range between Snake Valley and Fish Springs Flat (Link 630). From the southern end of this WSA viewers would see the Direct Route over one mile away. In this largely undisturbed landscape, the Direct Route would be noticeable, but would not be a dominant feature in the vast expanse of Tule Valley in the distance.

Swasey Mountain WSA - This WSA is located in the House Range (Link 630) between Tule Valley and Whirlwind Valley. Only two small portions of the northern boundary fall into the study corridors. Distant views of Direct Route from these areas would likely be screened by isolated hills at the end of the Swasey Mountains. The Direct Route would be subordinate to views northeast across Whirlwind Valley and Swasey Bottom over 3 miles away.

The 230kV Corridor Route and Cutoff Route (Link 470) would parallel two existing 230kV transmission lines across Whirlwind Valley. These routes would be subordinate to views south from this WSA and would be less than 2 miles away.

Recreation Effects

Although no developed recreation sites would be directly affected by the alternative routes, the SWIP would indirectly affect recreation resources. The presence of transmission line facilities may affect the experience available to recreation users. Towers, construction disturbances, and roads may affect recreation activities and experiences where they border, pass through, or cross developed and proposed recreation sites and areas. All park, recreation, and preservation areas within 3 miles of the assumed centerlines of the alternative study corridors were identified, mapped, and described during the inventory.

In general, all of the alternative routes would have a minor affect on dispersed recreation in the region. Off-highway vehicle (OHV) use (i.e., 4-wheel drives, motorcycles, and other all-terrain vehicles) could increase in some remote areas because of roads kept open for transmission line maintenance. This would be a potential benefit to public land users with OHVs. There could also be some benefit to dispersed hunting opportunities within remote areas because of potentially increased access.

The potential effects of the SWIP routes on recreation resources and the specific parks, recreation, and preservation areas that occur along each route are described below.

Midpoint to Dry Lake Segment

Route A - From Midpoint Substation to Jackpot, Nevada, several recreational sites occur along the route. Route A would pass adjacent to the Minidoka Relocation Center Interpretive Site (Link 20), adversely affecting the recreation experience of visitors to this historic site. The route would pass through the Snake River Rim Recreation Area, a BLM special management area between Interstate 84 and the Snake River canyon. That encompasses a large area of rural agricultural lands interspersed with the BLM-administered lands. In this largely developed area the adverse effects of Route A would be minimal except at a few specific recreation sites or features. In particular, the portion of this route that would cross the Murtaugh section of the Snake River, proposed for designation as a Wild and Scenic River, would diminish the experience of recreation users (e.g., river floaters) (Link 41). Similarly, the sight of this route crossing the Oregon Trail (Link 41) would briefly diminish the experience of users on this national recreation trail. Route A would minimally affect recreation at Nat-Soo-Pah, a private development located approximately 1 mile away. This route would only slightly increase the effects to recreation experiences where it would parallel the Upper Salmon to Wells 138kV and the Midpoint to Valmy 345kV transmission lines (Links 50, 70) near existing and proposed BLM campgrounds and recreation facilities located in the Salmon Falls Reservoir Special Recreation Management Area (SRMA).

From Jackpot, Nevada to the Robinson Summit Substation site, Route A would cross the California National Historic Trail three times (Links 1612, 211, 212), and the Pony Express Trail (Link 291). Construction disturbances and the presence of the SWIP at these crossings would diminish the recreation experience of users of these national trails. For dispersed recreation users in the South Pequop WSA (Link 212), the presence of Route A, 3 miles away in the Goshute Valley, would go largely unnoticed under most viewing conditions.

From the Robinson Summit Substation site to the Dry Lake Substation site, Route A would cross a portion of U.S. Highway 93, a designated scenic route (Link 675), and the proposed Kane Springs Backcountry Byway (Links 690, 700). Because viewing scenery is the major activity for users of these travelways, Route A would significantly diminish the experience of recreation travelers where it would be visible. Similarly, a large part of the dispersed recreation users' (e.g., hikers) experience can be attributed to viewing undisturbed natural landscapes. The presence of the SWIP would also adversely affect this recreation experience where Route A would pass near the Wayne Kirch Wildlife Management Area (Link 672), the Pahranagat National Wildlife Refuge, the Evergreen WSA (Link 690), the Delamar WSA (Link 690), the Desert National Wildlife Refuge (Link 690), the Fish and Wildlife 1, 2, & 3 WSAs (Link 700), and the Arrow Canyon WSA (Links 700, 720). The effects of Route A on primitive recreation opportunities would be significant where the SWIP would dominate views from WSAs (refer to Wilderness Effects in this chapter).

Route B - Route B is the same as Route A from Midpoint Substation to Jackpot, Nevada. From Jackpot, Nevada to the North Steptoe Substation site, Route B would cross the California National Historic Trail and California Trail Back Country Byway (Link 140), where viewing scenery is the major activity. Route B would introduce transmission line towers into the largely undisturbed landscape of Toano Draw, and the recreation experience of users would be significantly affected at each of the trail and byway crossings. This route would also pass within one-half mile of the Bluebell WSA (Link 222) and the Goshute Peak WSA (Links 222, 224, 226). The effects of Route B on primitive recreation opportunities would be significant where the SWIP would dominate views from WSAs (refer to Wilderness Effects in this chapter). From North Steptoe Substation site to Robinson Summit Substation site, Route B would cross the Pony Express Trail (Link 280). From Robinson Summit Substation site to the Dry Lake Substation site, Route B is the same as described for Route A.

Route C - Recreation effects for Route C from Midpoint Substation to Jackpot, Nevada, would be the same as those described for Route A. From Jackpot to the vicinity of Oasis, Nevada (Link 200), recreation effects would be the same as described for Route B. From the vicinity of Oasis to the Dry Lake Substation site, the recreation effects would be the same as those described for Route A.

Route D - From Midpoint Substation to HD Summit (Link 162), northeast of Wells, Nevada, recreation effects for Route D would be the same as those described for Route A. Route D would cross the California National Historic Trail (Link 167, 180, 190) three times. Like Route B, the recreation user experience would be significantly affected at each of the crossings of this trail. Route D would also pass adjacent to the South Pequop WSA (Link 190), where the effects on primitive recreation opportunities would be significant (refer to Wilderness Effects in this chapter). From Goshute Valley (Link 230) to Dry Lake Substation site, recreation effects for Route D would be the same as those described for Route A, except Route D would pass closer to Goshute Canyon WSA (Link 241, 242) in Steptoe Valley.

Route E - From Midpoint Substation to the vicinity of Oasis, Nevada (Link 200), the recreation effects of this route would be the same as those described from Route A. From the vicinity of Oasis to the Dry Lake Substation site, recreation effects would be the same as those described for Route B.

Route F - From Midpoint Substation to Jackpot, Nevada, Route F would pass through the Snake River Rim Recreation Area, a BLM special management area between Interstate 84 and the Snake River Canyon which encompasses a large area of rural agricultural lands interspersed with the BLM-administered lands. In this largely developed area, the adverse effects of Route F would be minimal, except where it would pass near or adjacent to a section of the Snake River that is proposed for Wild and Scenic River designation (Link 61), the west boundary of Hagerman Fossil Beds National Monument (Links 62, 64), and Salmon Falls Creek WSA (Link 64). In addition, this route would cross two portions of the Oregon Trail (Link 61, 64), U.S. Highway 30, and the Thousand Springs Scenic Route (Link 61) near Hagerman, Idaho. Near Hagerman, Route F would pass near Malad Gorge State Park (Link 61), parallel part of the Salmon Falls Creek Area of Critical Environmental Concern (ACEC), and pass within one-mile of the Balanced Rock State Park (Link 64). Route F would slightly increase in effects to recreation experiences where it would parallel the Upper Salmon to Wells 138kV and the Midpoint to Valmy 345kV transmission lines (Links 50, 70) near existing and proposed BLM campgrounds and recreation facilities in the Salmon Falls Reservoir SRMA.

From Jackpot, Nevada, to the vicinity of Oasis, Nevada (Link 200), recreation effects would be the same as those described for Route B. From the Oasis area to the Dry Lake Substation site, recreation effects would be the same as those described for Route A.

Route G - Recreation effects for Route G from Midpoint Substation to the vicinity of Contact, Nevada, would be the same as those described for Route A (to Link 130). At Link 130, Route G would turn southeast (Link 151) and cross the California National Historic Trail and the California Trail Back Country Byway. Like Route B, this route would introduce transmission line towers into a largely undisturbed landscape. The recreation experience of trail and byway users would be significantly affected at the crossings. From the Oasis vicinity (Link 200) to Currie, Route G is the same as described for Route A. From Currie to the North Steptoe Substation site, Route G would pass by the Goshute Canyon WSA (Links 241, 242, 244). The effects of Route G on primitive recreation opportunities would likely not be significant except where the SWIP would dominate views by visitors to Goshute Cave (Link 241) in the Goshute Canyon Special Natural Area. From North Steptoe Substation site to Robinson Summit Substation site, recreation effects for Route G would be the same as those described for Route B. From Robinson Summit Substation site to Dry Lake Substation site, recreation effects for Route G would be the same as those described for Route A.

Ely to Delta Segment

Direct Route - This route would cross three segments of the Pony Express Trail (Links 265, 266) near Stonehouse, Nevada, near the southern end of the Antelope Range. The recreation experience of users would be significantly affected in the area around the crossings of this trail by the introduction of transmission line towers into a largely undisturbed landscape.

The Direct Route would pass near the Fish Springs WSA and the Swasey Mountain WSA (Link 630). The effects of the Direct Route on primitive recreation opportunities would be significant where the SWIP would dominate views from wilderness areas or WSAs (refer to Wilderness Effects in this chapter). This route would also pass near the Topaz Lake Wildlife Management Area (Link 572).

Cutoff Route - The Cutoff Route would have the same effects on the Pony Express Trail (Links 265, 266) as described for the Direct Route. This route would pass within 2 miles of the Gandy Mountain ACEC. From Eskdale, Utah (Link 461), to Delta, Utah, the only significant recreation effects of the Cutoff Route would occur where the SWIP would dominate some dispersed views from WSAs including the Mt. Moriah Wilderness (Link 267), Howell Peak WSA (Link 462, 470), Notch Peak WSA (Link 462, 480), and the Swasey Mountain WSA (Link 470) (refer to Wilderness Effects in this chapter). The Cutoff Route would not affect the proposed interpretive site (Link 462) for Great Basin National Park (GBNP) or the Topaz Lake Wildlife Management Area (Link 572).

230kV Corridor Route - The 230kV Corridor Route would cross the entrance road to Cave Lake State Recreation Area (Link 380) parallel with two 230kV and one 69kV transmission lines. However, the addition of the SWIP would slightly increase the adverse effects of the existing lines in this area, but this route would not affect recreation in the park itself. The 230kV Corridor Route would pass near proposed BLM recreation areas at Comins Lake (Link 380) and through to the proposed Weaver Creek Scenic Area (Link 460). No impacts were identified at the Weaver Creek Scenic Area, as the withdrawal has been revoked by a notice published in the Federal Register by the BLM. The 230kV Corridor Route would pass within 2 miles of the northern boundary of GBNP in Sacramento Pass (Link 460). Part of the purpose of GBNP is to interpret the Basin and Range physiography of the region. Although the 230kV Corridor Route would not directly affect recreation in GBNP, this route would cross U.S. Highway 6/50 that many park visitors use to access the area. The 230kV Corridor Route, parallel to the existing 230kV transmission lines, would only slightly increase the affect on visitor's experience of the basin areas interpreted by the park. The route would also pass over one

mile from the Swamp Cedar Special Natural Area (Link 380) and more than 2 miles from Osceola Geologic Area (Link 460). These areas would be slightly affected by another line in this corridor. The 230kV Corridor Route from Eskdale (Link 462) to Delta, Utah would be the same as described for the Cutoff Route.

Southern Route - The Southern Route would cross the Horse and Cattle Camp Scenic Backcountry Byway (Link 364) twice. The recreation experience of users of this byway would be significantly affected at the crossings of this trail by the introduction of transmission line into a largely undisturbed landscape. This route would also pass within 2 miles of Ward Charcoal Ovens State Historic Site (Link 364) and within one mile of two proposed GBNP interpretive sites [on U.S. Highway 93 (Link 420) and Utah State Highway 21 (Link 451). These sites are proposed as part GBNP's interpretation of the Basin and Range physiography of the region. This route would adversely affect the potential future recreation experience of visitors to the area. The Southern Route would have significant recreation effects where the SWIP would dominate views from wilderness areas or WSAs, including the Mt. Moriah Wilderness, the Grafton WSA (Link 364), Wah Wah Mountains WSA (Link 451), King Top WSA (Link 451), and Notch Peak WSA (Link 451).

Herd Management Areas

Public lands in Nevada and Utah are home to herds of wild horses and burros. The BLM and Forest Service (FS) manage these animals under the Wild and Free Roaming Horse and Burro Act (1971), which states that wild and free roaming horses and burros are protected from capture, branding, harassment, or death. Wild horses are defined as unbranded and unclaimed horses with progeny that have used public lands on or after December 15, 1971, or that use Federal lands as all or part of their habitat. The Herd Management Areas (HMAs) are areas of public land where habitat is provided for one or more wild horse herds in order to maintain a good population, social structure, and age-sex ratio of the animals. The horses can move freely within the HMAs and often migrate every year as a function of weather and availability of food and water.

Following the release of the SWIP DEIS/DPA in June of 1992, the BLM raised the issue of potential effects of the SWIP routes on HMAs and what the impact would be on wild horses and burros. Their primary concern centered on the potential harassment of wild horses and burros during the construction phase of the SWIP transmission line and the loss of forage from the construction of access roads and tower sites. Other concerns were establishing fences that would inhibit movement to food and/or water and conflicts with humans.

Affected Environment

The SWIP alternative routes would affect HMAs in Nevada and Utah (refer to Tables 3-4 and 3-5). The BLM's highest concerns in Utah occur where critical habitats are crossed. These areas are monitored yearly and evaluated using trend plots. The trend plots are located in all HMAs to monitor habitat through the use of water and feed during extended periods of time. The trend plots help determine an accurate population of the herds, age-sex ratio, social structure, and general physical condition of horses and burros within the HMAs. On the Ely to Delta Segment, the Direct Route would disturb 7.8 miles of critical habitat and 2.5 miles on the Cutoff Route. No other routes within the Ely to Delta Segment or the Midpoint to Dry Lake Segment affect critical areas.

On the Midpoint to Dry Lake Segment, Route B would cross the most miles of HMAs within the study area (159.8 miles) and Routes A & C the least (123.8 miles). The agency preferred route crosses only 115.1 miles of HMAs. The worst route on the Ely to Delta Segment is the Direct Route which crosses 28.0 miles HMA and 7.6 miles of critical horse habitat. The southern route crosses only 13.1 miles of HMAs and no critical habitat.

Environmental Consequences

Because of their size and numbers throughout the study area HMAs, like range allotments, are unavoidable by the alternative routes. Issues considered during the impact analysis included the transmission lines creating a barrier or hazard to the movement of any wildlife species and the potential harassment by increased human activity/public access.

Ground disturbance caused by construction of the SWIP would result in the insignificant loss of habitat within HMAs. Access road construction and tower footings would result in insignificant long-term loss of forage. Construction of the SWIP transmission routes would likely displace herds from the vicinity of the right-of-way during high activity. However, the line would not inhibit the movement of the herds after its completion. Increased public access into the remote areas during construction may result in increased human harassment and trappings of wild horses. The increased harassment would alter the current plot trend studies and may create new locations to be established or borders moved.

Mitigation

To reduce potential impacts resulting from ground disturbance and increased levels of public access in HMAs crossed by alternative transmission routes, generic and selectively recommended measures would be applied. For example, restricting vehicle movement of construction equipment to routes (#1) and recontouring and revegetating disturbed areas where necessary (#3 & 4) would minimize the loss of forage. Limiting construction activities during sensitive periods (foaling season) (#11) would minimize harassment.

Impacts in the Oasis Area

During the formal public meetings for the SWIP DEIS/DPA in Wells, Nevada on August 4, 1992, residents of Oasis opposed the preferred alternatives that would pass west of Oasis along the base of the Pequop Mountains (Link 211). Their opposition was based on proposed development plans by Northern Holdings, Inc. and CSY Investments. These proposed developments were not identified during the SWIP inventory because neither of these developers have been actively seeking action by Elko County. This section addresses the concerns of these future developments. Written comments as well as a summary of comments expressed at the formal public meeting held in Wells by the residents of Oasis and representatives of these development companies are listed in Chapter 4 of this document.

Northern Holdings, Inc. - Northern Holdings, Inc. has future plans to develop residential and commercial uses in R66E T36N Sections 2 and 3, west of the existing development at Oasis. The development plans would be phased. The first phase would develop commercial uses, including infrastructure, traveler facilities, truck repair, restaurant, and other similar facilities. The second phase

would consist of subdividing a portion of Section 2 near the existing mobile home park into lots for a residential subdivision. There are also future plans to subdivide part of Section 3 for residential development. The primary concerns of the developers are the potential visual effects that the preferred alternatives would have on views from future residential areas, property values, and the unknown effects of EMFs.

CSY Investments - CSY Investments owns over 100,000 acres of land, much of it distributed in checkerboard fashion among the BLM-administered lands, in the Goshute Valley and around Oasis. Conceptual plans propose a large recreation and vacation development that extends from north of Interstate 80 near Oasis south into Goshute Valley. CSY Investments' planned development is particularly concerned with Link 211 which would traverse southwest from Squaw Creek across Interstate 80 and would then turn northwest and would pass within one mile of the Big Springs Ranch Headquarters. CSY Investments is concerned that Routes A, C, F, and G would significantly affect the scenery of Goshute Valley and marketability of the mini-ranch sites and water ranch sites proposed in the Big Springs Ranch Development Plan. The Big Springs Ranch Development Plan conceptualizes 24,960 acres of mini-ranch sites in the western half of Goshute Valley, 8,320 acres of mountain cabin and retreat areas along the foothills of the Pequop Mountains, 13,440 acres for a hunting club and wildlife management area, 8,960 acres of recreational use areas (e.g., off road vehicle use and camping facilities) on the east side of the Goshute Valley south of Interstate 80, 6,400 acres of tourist/commercial sites, and 1,920 acres for industrial sites along the interstate (Big Springs Ranch Proposed Land Use Diagram, 1992). CSY Investments also expressed concern for a private, unregistered grass airstrip near the Big Springs Ranch Headquarters.

Subroute Comparison

Link 211 was compared with Links 221 and 223 (Subroute Set 9) in Appendix D of the SWIP DEIS/DPA. The comparison summarized the impact data for the five resource disciplines of concern (i.e., biology, earth, visual, land use, and cultural). These links have been re-evaluated to consider the proposed developments of CSY Investments, Northern Holdings, Inc., and other public comments from the residents at Oasis.

Link 211 was environmentally preferred in the SWIP DEIS/DPA because it would be a less visually intrusive crossing of Interstate 80, a low visibility corridor designated by the Elko District of the BLM managed with Visual Resource Management (VRM) Class II (refer to Visual Resources in the SWIP DEIS/DPA). With the dark colors of the Pequop Mountains as a backdrop, this link would cause weaker visual contrast to travelers on Interstate 80.

Strong and moderate visual contrasts along Link 211 would result in high and moderate visual impacts to views from the possible future recreational ranch properties being planned along the base of the Pequop Mountains. Links 221 and 223 would traverse the center of the valley along the edge of one of the planned development area. Although visual contrasts would be strong to moderate, these links would be viewed from several miles away and would result in insignificant visual impacts to views from the planned recreational ranch properties. However, Links 221 and 223 would likely be more highly visible at the crossing of Interstate 80 in the middle of the valley and to views from dispersed recreation users in the Pequop Mountains and Toano Range.

In addition, Link 211 would cause less disturbance to shallow ground water areas, but would cross numerous intermittent streams east of the Big Springs Ranch Headquarters. Links 221 and 223 would

also cross numerous intermittent streams and some areas with high flood potential north of Shafter along the existing railroad.

The only sensitive wildlife species that would be effected by this link would be sage grouse leks in Goshute Valley. Link 211 is part of Routes A, C, F, and G, and is the environmentally preferred subroute through Goshute Valley. Sage grouse leks occur near the end of Link 221.

Links 221 and 223 would better utilize the BLM utility planning corridor, which follows the railroad corridor through the center of Goshute Valley, and would pass through the edge of the Lucin C MOA. Link 211 would require a plan amendment to the BLM's planning utility corridor in this area.

Impact Summary Table

Links	Biology			Earth			Land Use			Cultural			Visual				Comments
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	VRM	
211	0	0	1.6	17.6	0	0	0.8	14.5	0	7.1	0.9	0.3	15.1	17.0	0	5.8	Better crossing of I-80, closer to ranch
211 & 223	0.1	0	1.5	17.5	0.1	0	16.2	7.3	0	10.8	1.0	0.4	16.7	8.2	0	4.4	Utilizes railroad corridor, crosses less future development

Conclusions

In response to the public comments from residents at Oasis and the potential cumulative effects to planned developments by Northern Holdings, Inc. and CSY Development, the Agency Preferred Alternative has been modified slightly to follow Links 221, 223 along the railroad corridor through the center of Goshute Valley. The utility also prefers this subroute. This subroute would completely avoid future potential conflicts with Northern Holdings' properties and would minimize potential future impacts to significant portions of the CSY Investments' development. Because neither of these developments have been formally filed with Elko County the Environmentally Preferred Subroute is still Link 211.

Antelope Spring Trilobite Beds

The National Park Service, in a comment letter on the SWIP DEIS/DPA, identified an area of outstanding paleontological resources in the House Range that would be crossed by the 230kV Corridor Route.

The scientific value of the paleontological resources in the House Range has been described in a number of papers dating to 1875. The House Range, located in west central Utah, is famous for its Cambrian and Ordivician fossils including brachiopods, clams, sponges, trilobites, and other fossils totaling over forty different species (Bostick and Niles, 1975). Occurring primarily in the Notch Peak limestone strata of the House Range and adjacent outcrops, trilobites are the prize of commercial and amateur (i.e., rock hounds) fossil-gathers that use the area.

A study conducted in 1975 inventoried an area known as the Antelope Spring Trilobite Beds and found it to have paleontological resources of important scientific value. The study recommended that the area be evaluated for potential registry as a National Natural Landmark. The 1979 site evaluation included an area of 144 sections or approximately 92,000 acres. This potential site evaluation area would be crossed by the 230kV Corridor Route. The specific boundaries have yet to be determined and impacts to the potential registry as a National Natural Landmark cannot be assessed. However, impacts to paleontological resources were analyzed in the SWIP DEIS/DPA (refer to pages 4-4 through 4-8 of the DEIS/DPA).

The Agency Preferred Alternative (230kV Corridor Route) would cross through Marjum Canyon in the House Range. Much of this area was inventoried for the SWIP using a high sensitivity level for paleontological resources (also refer to the Volume II - Natural Environment Technical Report). Potential impacts of the construction in the area were determined to be low. Mitigation measures including use of existing access roads, overland access routes, and monitoring of construction by a qualified paleontologist are expected to minimize any impacts (refer to Tables 1-5 and 1-6 of this document). Specific stipulations will be developed in the COM Plan to mitigate significant resources that may be found during construction.

Sacramento Pass Mitigation Reroute

In response to public comments about impacts to private lands and potential visual impacts to travelers on U.S. Highway 6/50, several mitigation reroute alternatives were analyzed.

Affected Environment

This section provides a description of the resources potentially affected by rerouting for mitigation through the Sacramento Pass area. The following resources were inventoried:

- earth resources (soils, geology, paleontology, minerals, surface hydrology)
- biological resources (vegetation, wildlife, riparian, wetlands, and threatened, endangered, and other special-status species)
- land use resources (land jurisdiction, existing and planned land uses, parks, recreation, preservation areas, transportation and access, grazing and mining claims and extractive uses)
- visual resources (viewpoints, natural scenery)
- cultural resources (prehistory, enthnohistory, history, archaeology)

The inventory was completed to provide a basis to evaluate the impacts of each mitigation reroute alternative. Inventory methods were the same as described in the SWIP DEIS/DPA and the Technical Reports.

The resource discussions that follow are based on the following subroutes:

- Subroute 1 - Links 463, 469, 471, 473

- Subroute 2 - Links 464, 465, 469, 471, 473
- Subroute 3 - Links 464, 466, 468, 471, 473
- Subroute 4 - Links 464, 466, 467, 472 (part of the original 230kV Corridor Route)

Earth and Water Resources

Geology - There are no known active faults or geologic hazards in the Sacramento Pass area.

Paleontology - High sensitivity paleontological resources may be present in younger Tertiary sedimentary rocks (Tys) near Weaver Creek in the Snake Range as well as in Quaternary alluvium and colluvium (Qs) in large areas of the Snake Valley. Links 463, 464, 465, 466, 467, 468, 469, 471, 472, and 473 cross these areas, however, no known significant fossils have been found in the area.

Mineral Resources - Portions of the Osceola and Black Horse Mining Districts occur in the area. Mineral resources include silver, gold, copper, zinc, tungsten, and lead found in veins along faults and as replacement deposits in limestone. Placer deposits are also common. Mining in the area occurred primarily in the early 1900s but there are still some small placer operations (BLM 1993). Links 463, 464, 465, 566, 467, 469, 469, and 471 cross areas which may have mineral resources.

Soils - The soils include Typic Camborthids - Typic Torriorthents - Xerollic Haplargids with a slight erosion hazard (Links 467 and 471), Xerollic Durorthids - Xerollic Durargids - Xerollic Haplargids with a moderate erosion hazard (Links 476 and 471), Typic Xerorthents - Lithic Xerorthents (may unit 49) with a moderate erosion hazard (Links 463, 464, 465, 466, 467, 468, 469, and 471), and Aridic Haploxerolls - Lithic Argixerolls - Rock Outcrop with a moderate erosion hazard (Links 463 and 464). These soil units are described in Table ER-6 of the SWIP DEIS/DPA.

Water Resources - Several intermittent drainages occur in the Sacramento Pass area. Perennial streams in the area include Weaver Creek and Silver Creek. Silver Creek is crossed by Link 467 at two location, and by Link 471 at two locations. Weaver Creek is crossed at one location each along Links 464, 467, 467, and 468. Springs located within 0.5 mile of the proposed centerline occur along Link 467 (2 spring locations) and Link 469 (1 spring location). Numerous springs occur in the region.

Refer to Figure 3-6 for an illustration of sensitive Earth Resources.

An inventory of the Sacramento Pass alternatives was completed based on the methods and results as described in Chapter 3, Affected Environment, of the SWIP DEIS/DPA as well as in the Technical Report for the Natural Environment-Volume II. Information on part of the area is discussed under the "230kV Corridor Route" section of the SWIP DEIS/DPA and under the section "Nevada" for the various disciplines geology, paleontology, mineral resources, soils, and water resources in the Technical Report, Volume II, Chapter 2, pages 3-1 to 3-27.

Subroute 1

This subroute crosses 5.4 miles of areas with potentially high sensitivity paleontological resources (Links 463, 469, 471), although no fossils have been found in the area. There is no prime farmland along this subroute.

Subroute 2

This subroute crosses 7.1 miles of areas with potentially high sensitivity paleontological resources (Links 464, 465, 469, 471) although no fossils have been found in the area. There is no prime farmland along this subroute.

Subroute 3

This subroute crosses 6.9 miles of areas with potentially high sensitivity paleontological resources (Links 464, 468, 471) although no fossils have been found in the area. There is 1.2 miles of prime farmland along the assumed centerline of Link 467.

Subroute 4

This subroute crosses 1.3 miles of areas with potentially high sensitivity paleontological resources (Links 464, 467) although no fossils have been found in the area. There is 1.2 miles of prime farmland along the assumed centerline of Link 467.

Biological Resources

Wildlife species which occur in the area include pronghorn antelope, mule deer, bobcat, mountain lion, coyote, whitetail, antelope squirrel, and desert cottontail. Common bird species include chukar partridge, horned lark, golden eagle, prairie falcon, and red-tailed hawk (Gordon, personal communication, 1993). Refer to Figure 3-7 for an illustration of sensitive Biological Resources.

The mitigation reroute alternatives through the Sacramento Pass area traverse sagebrush shrub, mountain shrub, grassland, and riparian communities (refer to Figure 3-8). Sagebrush scrub, characterized by greasewood and big sagebrush associations, occurs along all the subroutes. Mountain shrub, primarily pinon-juniper woodlands, occurs along the western links at higher elevations (Links 460, 463, 464, 465, and 466). Riparian woodlands, characterized by narrowleaf cottonwood and willow, are supported by Silver Creek (Links 467, 471). Grasslands, characterized by winter fat, galleta grass, and Indian ricegrass occur along the Utah portions and are scattered in Nevada. Playas, characterized by very sparse vegetation cover, occur near the Nevada-Utah border.

Subroute 1

Wildlife - Seven special status bird species have been identified as potentially occurring in the area by agency personnel in Utah (Gordon, personal communication, 1993). Bald eagle and peregrine falcon are listed as endangered at the federal and state levels. Bald eagles are residents of the Snake Valley and the Ferguson Desert (south of the area) during winter months, although no active nests are known to exist along the proposed links. Peregrine falcons are occasional migrants during the fall and spring. Ferruginous hawks and loggerhead shrikes (Federal candidate Category 2 species) and golden eagle, mountain bluebird, and Swainson's hawk (sensitive species) may nest in suitable habitat within the SWIP location.

The area provides year-long habitat for antelope. Link 471 crosses through identified crucial antelope kidding grounds (Podborny, personal communication, 1993). No crucial raptor habitat exists within the proposed area and no known active raptor nests occur within one mile of the assumed centerline.

Plants - Three special status plant species have been identified within the area. One of the three special status plant species is Swertia gypsicola. Its known habitat exists along the eastern links in Utah (Links 471 and 473), although exact locations were not identified. This is a Federal candidate, Category 2 plant species that occurs in desert areas characterized by greasewood-saltbush associations (Mendenhall, personal communication, 1993). Two special status plant species were identified within Nevada (NNHP 1993). Sclerocactus pubispinus occurs within the one-mile corridor for Link 463. It is protected in the State of Nevada by the Cactus and Yucca Law. Two populations of the third species, Cymopterus basalticus, occur. One is located within one-mile of Link 471 and one is along the assumed centerline of Link 471. This is Federally listed as 3C (more common than frequently believed) and is a watch species in Nevada (Northern Nevada Native Plant Society - NNNPS).

Subroute 2

Wildlife - Special status wildlife species are the same as those described for Subroute 1.

Plants - Known habitat for Swertia gypsicola exists along the eastern links in Utah (Links 471 and 473), although exact locations were not identified. This is a Federal candidate, Category 2 plant species that occurs in desert areas characterized by greasewood-saltbush associations (Mendenhall, personal communication, 1993). The third species, Cymopterus basalticus, occurs within one-mile of Link 465. This is Federally listed as 3C (more common than frequently believed) and is a watch species in Nevada (NNNPS).

Subroute 3

Wildlife - Special status wildlife species are the same as those described for Subroute 1.

Plants - Habitat for one special status plant species, Swertia gypsicola, occurs in Utah along Links 471 and 473 as described for Subroute 1.

Subroute 4

Wildlife - Special status bird species are the same as those described for Subroute 1.
Although the area provides year-long habitat for antelope, no critical habitat has been identified along these links. Antelope kidding grounds occur north of Link 467, within the one-mile corridor (Podborny, personal communication, 1993). Antelope kidding grounds are important. However, to remain consistent with the previous analysis, the grounds have not been identified as crucial. No crucial raptor habitat exists within the proposed area and no known active raptor nests occur within one mile of the assumed centerlines.

Plants - One special status plant species has been identified within the area. Known habitat for Swertia gypsicola exists along the eastern links in Utah (Links 467 and 472), although exact locations were not identified. This is a Federal candidate, Category 2 plant species that occurs in desert areas characterized by greasewood-saltbush associations (Mendenhall, personal communication, 1993).