

APPENDIX B

ALTERNATIVE ROUTES ADDED AND ELIMINATED

As stated in Chapter 2 and Appendix A, a number of segments of alternative routes were added to or eliminated from the study. These alternatives have been added or eliminated as a result of (1) scoping and agency review, and (2) the environmental analysis. The purpose of this appendix is to briefly explain the reasons for adding and eliminating alternatives. (Appendix A provides an explanation of the route selection process.)

ALTERNATIVE ROUTES ADDED AS A RESULT OF SCOPING AND AGENCY REVIEW

The locations of these alternative routes, labeled A through M, are shown in blue on Figure B-1.

- ***A—Alternative across the Hualapai Indian Reservation*** This alternative route parallels the APS 500kV line across the Hualapai Reservation. This route was initially considered for detailed studies, but in mid-1993 the Hualapai Tribal Council asked Western to eliminate consideration of a new line across the reservation. However, in January 1994, the Hualapai reconsidered and requested that the route be included in NTP as an alternative.
- ***B—Alternative in the vicinity of Hackberry*** This alternative was added because of siting constraints identified by Western during the construction of the Mead-to-Phoenix 500kV transmission line through the community of Hackberry.
- ***C—Alternatives in the vicinity of Seligman and Aubrey Valley*** As a result of the mid-1993 Hualapai decision for no new line across the reservation, several alternatives were added west of Aubrey Valley for the primary purpose of providing north or south connections to initially identified routes.
- ***D—Alternatives through the Kaibab National Forest*** These routes were added to provide connections from the potential Lava Point Substation site to the northern alternative in the western portion of the project area. In addition, another route was added to the east of the existing alternative routes to respond to visual concerns expressed by the Forest Service for users of the Arizona Trail.
- ***E—Alternatives in the vicinity of Preston Mesa*** These routes near Preston Mesa were added to provide a “cut-off” along the northern route in the event that a connection with a substation in the Page area (e.g., Glen Canyon Substation) is not needed.
- ***F—Alternative in the vicinity of Kayenta*** As suggested by NPS, this route was added to diverge from the existing 230kV line to avoid locating a second transmission line through the Monument Valley Navajo Tribal Park.
- ***G—Alternative through the Chinle Valley*** This route was added to provide an alternative that avoids a crossing of the Chuska Mountains because of concern expressed by the BIA and the Navajo Nation.

- ***H—Alternatives in the vicinity of the San Juan Generating Station and the Four Corners Power Plant*** Several routes were identified paralleling existing utility corridors because of concern expressed by the BLM for The Hogback ACEC and threatened and endangered plant species in the area.
- ***I—Alternative in the vicinity of Gallup and St. Michaels*** BIA requested that this easternmost corridor be added as a means of accessing the southern corridors while minimizing impacts on the Chuska Mountains.
- ***J—Alternative in the vicinity of Dilkon*** This route was added to avoid impacts on numerous residences dispersed in the area.
- ***K—Alternatives in the vicinity of the Flagstaff Substation*** Because of input from Western, Forest Service, and NPS, several alternatives were added to provide an option for Western to access its Flagstaff Substation located south of I-40.
- ***L—Alternative in the vicinity of Tribal Route 15 southeast of Sunset Crater*** This alternative route was added as a result of input from the Forest Service to avoid crossing the Beale Wagon Road and to minimize crossings of Tribal Route 15. This alternative route parallels an existing pipeline corridor.
- ***M—Alternatives in the vicinity of Page*** This alternative route was added at the suggestion of the city of Page to minimize impacts on land uses in the city of Page and the Glen Canyon NRA.
- ***N—Alternatives Crossing the Kaibito Plateau*** These two alternative route segments were added as opportunities around the Bennett Freeze area, reasserted in late September 1995.

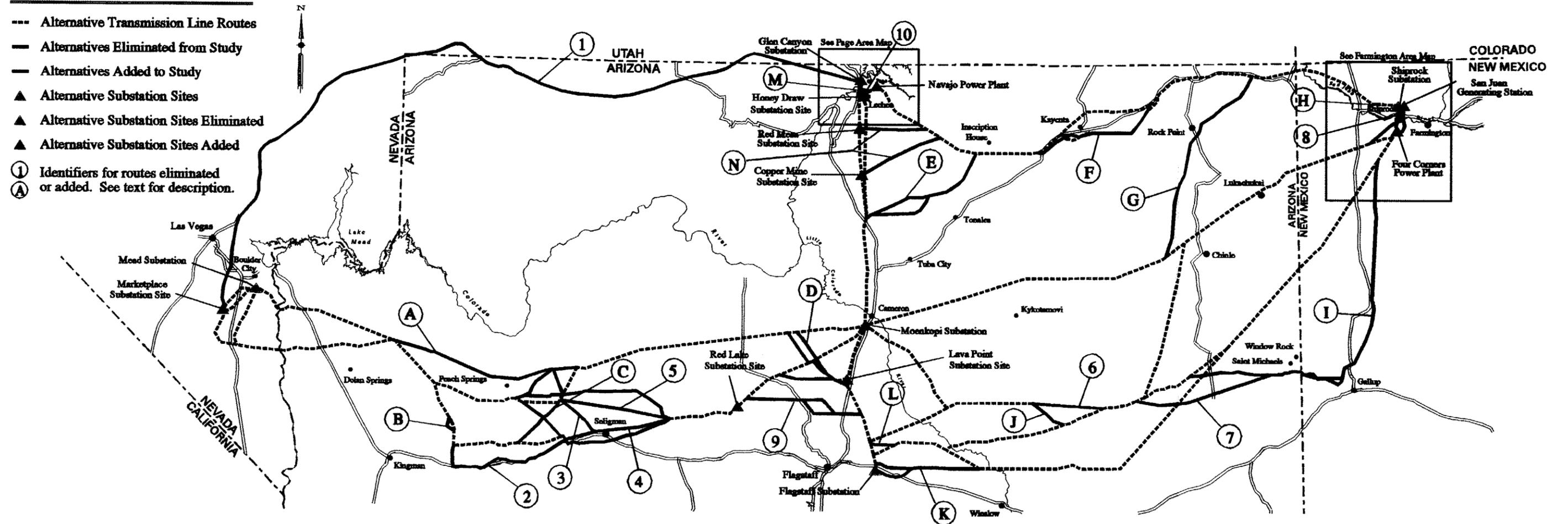
ALTERNATIVE ROUTES ELIMINATED AS A RESULT OF SCOPING AND AGENCY REVIEW

This section addresses the reasons that alternatives were eliminated as a result of scoping and agency review. The locations of these alternative routes, labeled 1 through 10, are shown in red on Figure B-1.

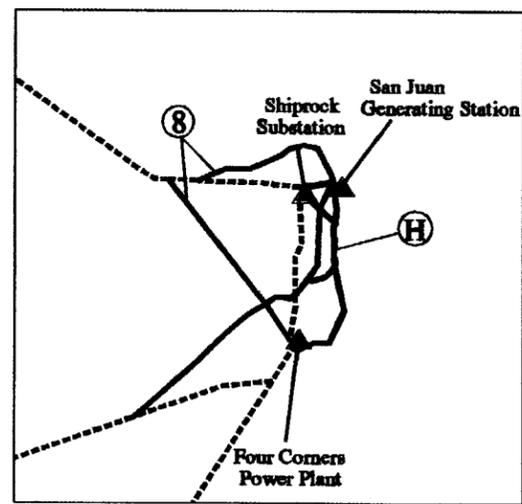
- ***1—Alternative paralleling the existing Navajo to McCullough 500kV Transmission Line*** As depicted in the Navajo Transmission Project *Regional Environmental Feasibility Study* (June 1992), this alternative was located west of the Glen Canyon dam and north of the Grand Canyon in Arizona, and then proceeded south to the Eldorado and McCullough substations southeast of Boulder City, Nevada. During initial agency meetings a number of environmental issues associated with this alternative were identified including (1) proximity to wilderness areas in Arizona and Nevada; (2) crossing the Virgin River (eligible as wild and scenic); (3) crossing the Moapa Indian Reservation; (4) desert tortoise habitat; (5) raptor habitat; (6) bighorn sheep habitat; (7) residences; (8) a proposed BLM land exchange in the Henderson area; and (9) crossing the Sunrise Mountain Instant Study Area (ISA). The Sunrise Mountain ISA protects unique geologic, biologic, and aesthetic values to be managed by BLM's WSA interim management policy, preserving the area's

Legend

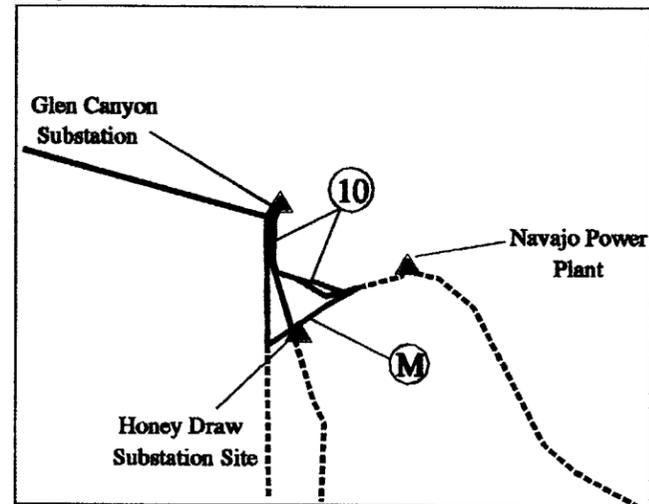
- Alternative Transmission Line Routes
- Alternatives Eliminated from Study
- Alternatives Added to Study
- ▲ Alternative Substation Sites
- ▲ Alternative Substation Sites Eliminated
- ▲ Alternative Substation Sites Added
- ① Identifiers for routes eliminated or added. See text for description.



Farmington Area Detail



Page Area Detail



**Alternative Routes
Added and Eliminated
as a Result of Scoping
and Agency Review**

existing wilderness values until actual wilderness status can be determined. This management policy restricted any future development of new transmission line projects through the ISA. Because legislative action to change the current management status is pending and a resolution is uncertain, this alternative would not meet the proposed project need or in-service date. Based on these issues and concerns, BLM and Western recommended that this alternative be dropped from further consideration.

- **2—Alternative paralleling I-40 between the communities of Seligman and Kingman south of Links 1720, 1960, and 2000** This alternative paralleled an existing pipeline corridor from the Juniper Mountains to US 93, and then paralleled the Western 345kV Mead-to-Liberty transmission line. This corridor contains approximately five underground pipelines, which would mean potential construction and right-of-way conflicts in areas of restrictive terrain. Potentially significant impacts on viewers from I-40 and from concentrated residential development near the intersection of I-40 and US 93 resulted in Western's recommendation to eliminate this alternative from further consideration.
- **3—Alternative paralleling historic Route 66 through the Aubrey Valley** As depicted in the *Regional Environmental Feasibility Study*, this alternative was located near Chino Point on the south end of the Aubrey Cliffs and terminated approximately 14 miles to the northwest near the Pica railroad siding. This corridor roughly paralleled historic Route 66 and the Topeka & Santa Fe Railroad alignment. The BLM Kingman Resource Area expressed concern about the potential for high visual impacts on views from historic Route 66. The combined effect of high structure contrast, sensitive views, and a long viewing duration would result in potentially significant visual impacts, and resulted in elimination of the alternative from further consideration.
- **4—Alternative in the vicinity of Seligman, Arizona** Another alternative in the *Regional Environmental Feasibility Study* paralleled an AT&T fiber optic cable and El Paso Natural Gas Company (EPNG) pipeline near the community of Seligman, Arizona. The eastern portion of this route began along the fiber optic corridor approximately six miles west of the western boundary of the Kaibab National Forest and continued west to a crossing at historic Route 66 approximately three miles east of Seligman. The western portion of this route remained north of I-40 and paralleled the EPNG pipeline for approximately nine miles from the fiber optic cable crossing at historic Route 66 to a point south of Black Mountain.

Potentially significant impacts on land uses and visual resources were identified along this route. Extensive residential development was identified five to ten miles west of Seligman and north of I-40, and the Seligman airport is oriented toward the proposed alignment. Visual impacts would result because the tower structures would dominate the foreground views from residences. Because of potentially significant land use and visual impacts along this route near the town of Seligman, Western recommended that this alternative be eliminated from further consideration.

- **5—Alternative through the Big Boquillas Ranch** This alternative crossed the Big Boquillas Ranch and Aubrey Cliffs to the west, approximately one mile south of Round Mountain and Trinity Mountain, then continued into the Aubrey Valley and terminated near the Pica railroad siding. Western recommended that this alternative be eliminated because of engineering constraints

associated with difficult terrain located at the base of Round Mountain, the crossing at Big Chino Wash, and along the Aubrey Cliffs.

- **6—Alternative through the Hopi Buttes** This alternative was located approximately seven miles north of Dilkon in the distinctive landscape of lava-capped buttes and small mesas known as the Hopi Buttes. Located among the buttes and mesas are numerous residences and ranches, resulting in a high potential for direct conflicts with a transmission line and right-of-way. The area also was identified as having cultural and religious significance to the Hopi Tribe, whose reservation is located north of the Hopi Buttes. Because of the probability of significant impacts on land use and cultural resources, the eastern portion of this alternative was realigned to the south.
- **7—Alternative paralleling the Transwestern Pipeline corridor west of Window Rock** This alternative paralleled the existing 30-inch-diameter Transwestern pipeline corridor from the EPNG Window Rock Pumping Station southwest to the EPNG pipeline corridors approximately eight miles east of Greasewood. Western recommended that this alternative be eliminated from further consideration because of potential conflicts associated with approximately 20 residences located immediately adjacent to the existing pipelines, and a paved airstrip located within the alternative study corridor.
- **8—Alternatives in the vicinity of the Four Corners Power Plant and the San Juan Generating Station** Early in the project Western and DPA decided it would be most advantageous to use Western's Shiprock Substation as the eastern terminus for NTP. Therefore, several links emanating from either of the two generating stations were no longer needed and eliminated from further consideration.
- **9—Alternatives paralleling a fiber optic cable corridor through the Coconino National Forest** Four alternative links paralleled an underground east-west AT&T fiber optic cable and a major coaxial cable that crosses the Coconino and Kaibab national forests north of Sunset Crater National Monument and the San Francisco Peaks. Representatives from the Coconino National Forest requested that these links be eliminated from further consideration. Even though the corridor is identified in the Forest Plan map as an "Existing Communications Corridor/Potential Upgrade," the Forest Service stated that an overhead 500kV transmission line would not be a compatible use of the corridor. The transmission line, an overhead facility, would be intrusive visually in this area of the forest and the major coaxial cable could be affected by the transmission line. For these reasons and since there were other viable east-west alternative routes, the alternative was eliminated.
- **10—Alternatives in the vicinity of the Glen Canyon Substation** When Western determined that it would not be necessary for the transmission line to proceed into Glen Canyon Substation, several alternatives leading to the Glen Canyon Substation were eliminated from further consideration.

ALTERNATIVE ROUTES ELIMINATED AS A RESULT OF ENVIRONMENTAL ANALYSIS

All of the alternative routes studied are shown on Figure A-1. As explained in Appendix A, these alternatives were inventoried to determine the environmental resources present and assessed to identify potential impacts. Then the alternatives were systematically screened and compared to identify the most environmentally preferable alternative routes, thereby narrowing the number of alternative routes to be compared and addressed in the DEIS.

To facilitate screening and comparison, the project area was divided in two—the eastern area and western area. The alternatives in each area were then reviewed (screened) at three levels including local (Level 1), subregional (Level 2), and regional (Level 3) areas. Through the screening process, alternatives defined by individual links or combinations of different links were compared. The comparison of alternatives at these three levels resulted in the identification of preferred pathways between two common endpoints for each level of screening. Those links that were unique to alternatives that were considered less desirable were eliminated as shown on Figure B-2. This screening process resulted in the identification and initial ranking of complete alternative routes in the eastern and western areas that were presented to the public and agencies for review during the summer of 1995. Through this review, a limited number of key issues were identified. This process led to refinement of certain data, additional analysis, and identification and screening of new alternatives in selected locations in the eastern area.

A summary of the alternative links eliminated during the screening process are illustrated in Figures B-3 and B-4. An overview discussion of the alternatives eliminated as a result of screening are summarized below.

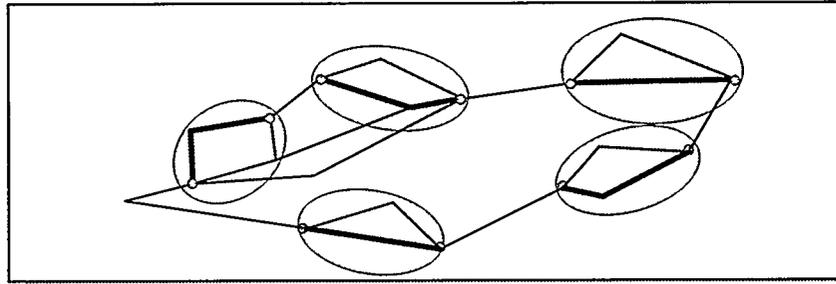
EASTERN AREA

Level 1 Screening—Local Areas

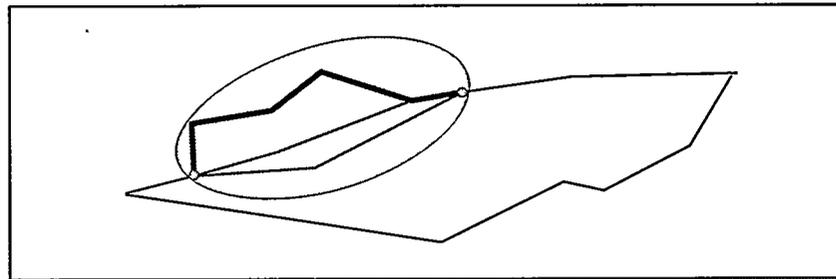
Initially, nine separate Level 1 screening areas were evaluated in the eastern portion of the project area.

- ***San Juan/Four Corners area (Links 200, 220, 260, 280, 320, and 680)*** The key factors that influenced the elimination of specific links in this area are potential impacts on residential and public land uses, scenic quality in and around The Hogback, views from residences, and two special status cultural resource sites (Pictured Cliffs and Hogback Chaco Protection Site). Potential impacts associated with the crossing of the San Juan River and agricultural lands were assumed to be mitigable. Those links in proximity to the highest density of residential development and to the Pictured Cliffs or Hogback Chaco Protection Site were eliminated.

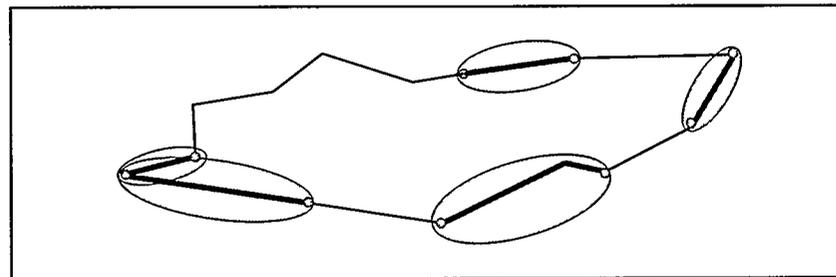
Level 1 - Compare Local Areas



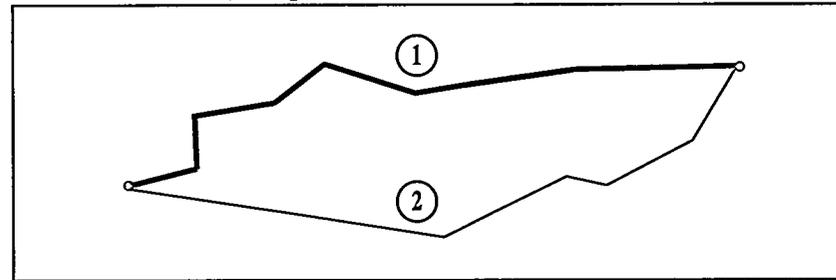
Level 2 - Compare Sub-regional Areas



Characterize Connectors



Level 3 - Assemble, Compare and Rank Alternative Routes - Regional Areas



**Screening and Comparison Approach
Navajo Transmission Project**

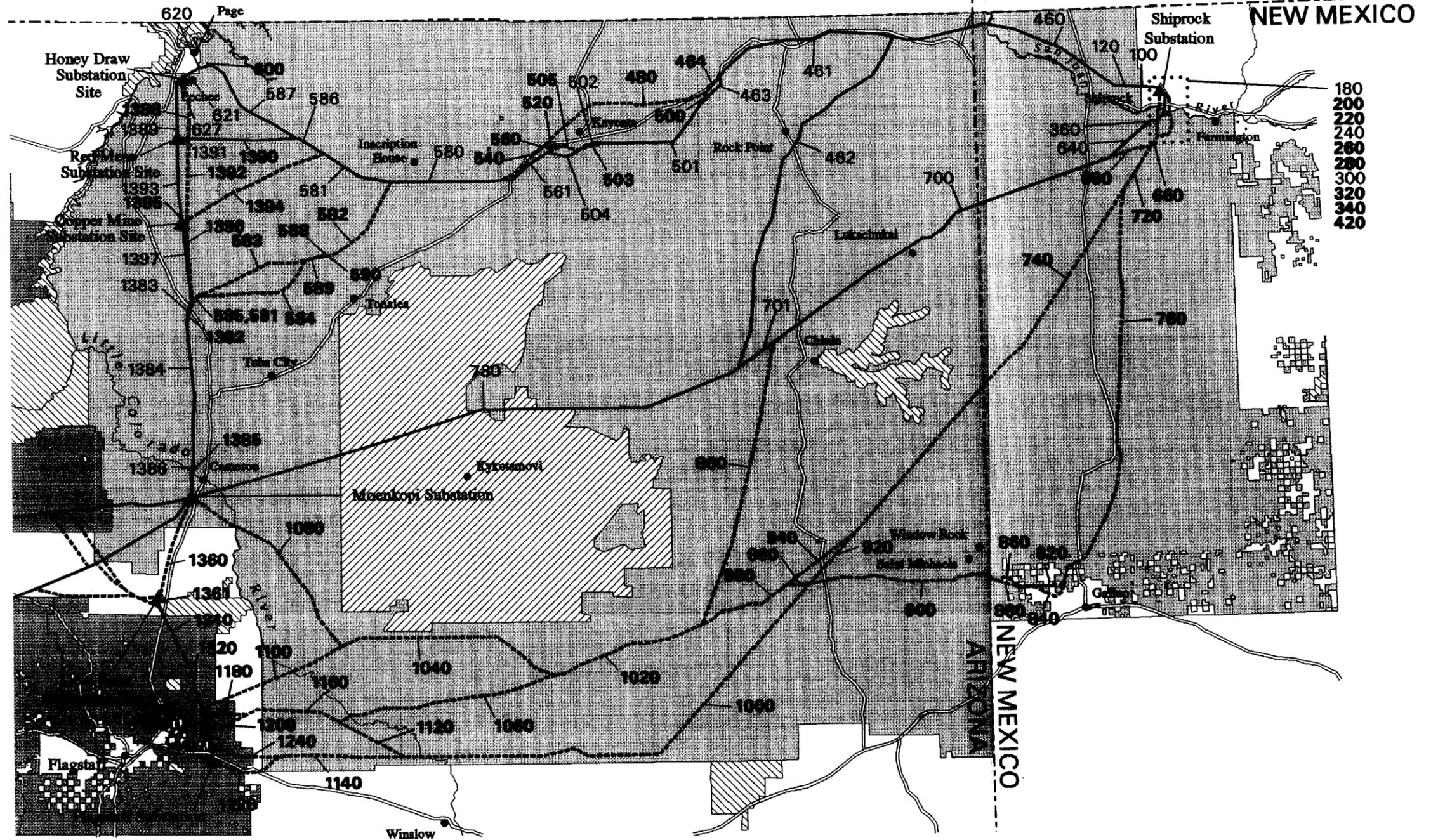
MATCH
LINE

EASTERN AREA

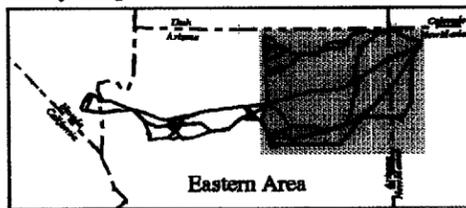
Legend

-  Navajo Indian Reservation
-  Hopi Indian Reservation
-  Hualapai Indian Reservation
-  National Parks and Recreation Areas
-  National Forests
-  Private, Municipal, or Bureau of Land Management
-  Alternatives Eliminated from Study
-  Alternatives Retained
-  Alternative Substation Sites Eliminated
-  Alternative Substation Sites Retained
- 720** Link Identifier (eliminated)
- 582** Link Identifier (retained)

1:1,250,000



Key Map



Alternative Routes Studied and Eliminated

Eastern Area

Navajo Transmission Project

Figure B-3

WESTERN AREA

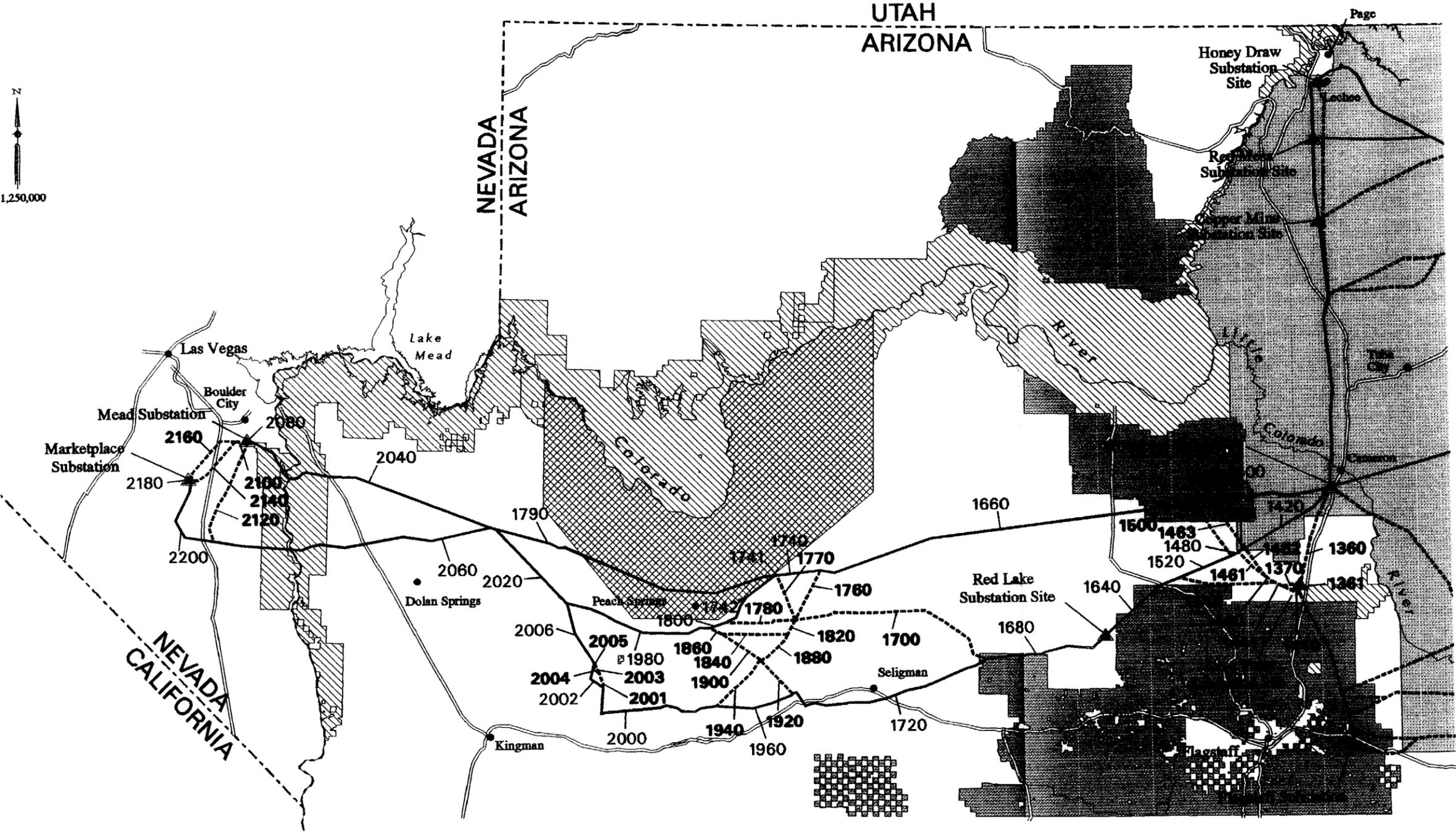
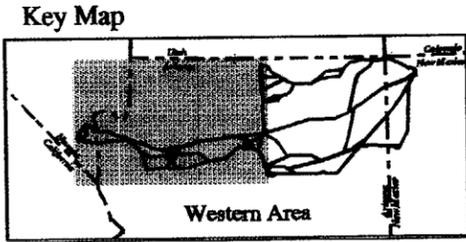
MATCH LINE

Legend

-  Navajo Indian Reservation
-  Hopi Indian Reservation
-  Hualapai Indian Reservation
-  National Parks and Recreation Areas
-  National Forests
-  Private, Municipal, or Bureau of Land Management
-  Alternatives Eliminated from Study
-  Alternatives Retained
-  Alternative Substation Sites Eliminated
-  Alternative Substation Sites Retained



1700 Link Identifier (eliminated)
 1660 Link Identifier (retained)



Alternative Routes Studied and Eliminated

Western Area
 Navajo Transmission Project
 Figure B-4

- **Monument Valley area (Links 480, 520, and 540)** Link 480 was eliminated primarily because it crossed the Monument Valley Navajo Tribal Park for a total distance of 4.5 miles. Although the proposed transmission line could have paralleled the existing 230kV line across the Tribal Park, NPS recommended that the Tribal Park be avoided. Even though Links 520 and 540 paralleled the existing 230kV line, the links were eliminated because of potential impacts on residential development in the Marsh Pass area along U.S. Highway 160.
- **Gallup area (Links 820 and 880)** Links 820 and 880 paralleled a buried pipeline where there would be higher impacts on visual resources than the alternative links that follow an existing 115kV (overhead) line (Links 840 and 860). There also is a higher density of residential development along the pipeline corridor.
- **Preston Mesa area (Link 583)** Link 583 was eliminated because of potential impacts on Navajo traditional cultural places, crossing of a Hopi ritual place, and higher visual impacts on residential viewers.
- **Glen Canyon area (Links 1388, 1392, and 1396)** These links were eliminated because they crossed a Hopi ceremonial hunting area and two Hopi rock collection areas, and because they were generally adjacent to a higher-density residential development in the vicinity of Coppermine than Links 1389, 1393, and 1397.
- **The Gap area (Link 1382)** The comparison between Links 1382 and 1383 resulted in only a slight difference; the links are parallel and close to one another, and both parallel existing 345kV transmission lines. However, Link 1382 was eliminated because of higher level of potential ground disturbance from construction and the number of residences in proximity.
- **Cameron area (Link 1385)** Similar to The Gap area, Links 1385 and 1386 parallel and are generally close to one another. Link 1386 was retained as a continuation from Link 1383 as it parallels the same existing 345kV line, which would result in less construction disturbance and was a first choice preference for all resources.
- **Flagstaff area (Link 1240)** Link 1240 crossed the Ridge Ruin Archaeological District, a special status cultural resource listed on the National Register of Historic Places. In addition, because this link did not follow an existing utility corridor, there would be a greater potential for higher impacts on archaeological resources.
- **Sunset Crater area (Link 1180)** Link 1180 followed an existing pipeline corridor, but there would be higher impacts on views from residences. There also is higher density residential development along this link and impacts on Navajo traditional cultural places are higher than for Links 1200 and 1280.

Level 2 Screening—Subregional Areas

As a result of the initial Level 2 screening in the eastern portion of the project area, two links were eliminated.

- **Wupatki area (Link 1100)** Link 1100 would have been a new corridor. Alternatives including Link 1110 would be longer and would result in high impacts on archaeological resources, Navajo traditional cultural places, scenic quality, and residential views. In addition, Link 1100 followed Links 1320 and 1340 near Sunset Crater and Wupatki National Monuments.
- **Chuska area (Link 800)** Link 800 would have been a new corridor for approximately 50 miles extending south from Ventana Mesa to west of Greasewood. High impacts on scenic quality and residential views would have resulted. Also, Link 800 was located in an area of high sensitivity for Navajo and Hopi traditional cultural places. Connections with Link 800 required the crossing of the Chuska Mountains along Link 700, resulting in additional high impacts on Navajo traditional cultural places and concerns for biology and proximity to residences.

Level 3 Screening—Regional Areas

The third level of screening involved creating complete alternative routes from the remaining links, between the Shiprock and Moenkopi substations. The comparison of these alternatives focused on the elimination of the least environmentally preferable. Of the 12 alternatives (listed below), eight were eliminated from further consideration. With the elimination of these alternative transmission line routes, the Lava Point Substation and Flagstaff Substation were also eliminated.

- | | |
|--------------------------------------|--------------------------------------|
| ■ Glen Canyon 1 (GC1) | ■ South-central 3 (SC3) (eliminated) |
| ■ Northern 1 East (N1E) | ■ South-central 4 (SC4) (eliminated) |
| ■ Central 1 (C1) | ■ Southern 1 (S1) (eliminated) |
| ■ Central 2 (C2) | ■ Southern 2 (S2) (eliminated) |
| ■ South-central 1 (SC1) (eliminated) | ■ Southern 3 (S3) (eliminated) |
| ■ South-central 2 (SC2) (eliminated) | ■ Southern 4 (S4) (eliminated) |

The links of the alternative routes eliminated include 340, 420, 660, 720, 740, 760, 840, 860, 900, 920, 940, 960, 980, 1000, 1020, 1040, 1060, 1080, 1120, 1140, 1160, 1200, 1220, 1260, 1280, 1300, 1320, 1340, 1360, 1361.

In general, the south-central (SC1 through SC4) and southern alternatives (S1 through S4) were not as environmentally desirable as the northern (GC1, N1) and central (C1, C2) alternative routes. Based on the results of the interdisciplinary comparison of these alternative(s), the northern and central options included the preferred alternative for each individual resource (water, soils, biology, paleontology, land use, visual, archaeology and history, and special status sites), with the exception of traditional cultural places (S4). However, S4 was ranked at 50 percent or lower among preferences for all other resources in the eastern area (excluding archaeology and history).

The south-central and southern alternatives were also generally longer than the northern and central options. The southern alternatives, in particular were among the longest of the eastern area alternatives ranging from approximately 263 miles (S1) to 300 miles (S3 and S4). This additional length, was in part to avoid the Chuska Mountains, which required locating alternatives farther south and east near Gallup.

The south-central and southern alternative routes paralleled segments of existing utility corridors connected by some new corridor. The utility corridors contain overhead transmission lines and/or buried pipelines for much of their lengths. For a project like NTP, it is preferable to parallel utility corridors containing transmission lines—a new transmission line introduced into an area parallel to an existing pipeline would be more intrusive than it would be paralleling an existing transmission line. Existing transmission lines were not continuous in the south-central and southern alternative routes. That is, the direction of some lines proceed into other geographic areas (e.g., two Tucson Electric Power Company 345kV lines along NTP Links 760 and 840 continue south in the vicinity west of Gallup). The amount of corridor without transmission line (e.g., new corridor or corridor with pipeline only) ranged from 65 to 139 miles, much of which was located in environmentally sensitive areas in the vicinity of the Hopi Buttes (SC1, SC2, S1, and S2) and the Painted Desert (SC1 and S1). Even where existing transmission lines would have been paralleled in the south-central and southern alternatives, the opportunities were not as environmentally preferable as in the northern and central areas (e.g., based on impacts and issues in the Chuska Mountains [SC1, SC2, SC3, and SC4], and near Sunset Crater and Wupatki National Monument [SC2, SC3, SC4, S2, S3, and S4]).

Specific resource issues and environmental impacts leading to the elimination of the south-central and southern routes included the following:

Visual Resources—The south-central and southern alternatives were the least preferred for visual resources. New transmission line corridor between Greasewood and Dilkon in the Hopi Buttes area (Link 1020), Dilkon to the Moenkopi Substation in the Painted Desert (Links 1040 and 1080), in the Rincon Basin (Link 1000) and Canyon Diablo (Link 1140) were all determined to have potentially high impacts on residential viewers and/or scenic quality. In addition, each of the south-central and southern alternatives were within view of either Wupatki National Monument and/or Sunset Crater National Monument and several of these alternatives (SC2, SC3, SC4, S2, S3, and S4) were located immediately adjacent to Wupatki National Monument.

Biological Resources—Similar to visual resources, the south-central and southern alternatives also were least preferred from a biological standpoint, particularly the south-central options (SC1, SC2, SC3, and SC4), which would require a lengthy crossing of the Chuska Mountains. The Chuska Mountain area is considered to be important habitat for big game and several listed plant and animal species in Arizona, and is of concern to the Navajo Nation. The Chuska Mountain crossing along Link 740, common to all south-central alternatives, was approximately 14 miles long and would result in a greater quantity and magnitude of potential impacts than the more northerly crossing along Link 700 (C1), which is approximately five miles in length.

Cultural Resources—A transmission line in the south-central and southern alternatives would have adversely affect the greatest number of special status sites and were considered less preferable than the northern and central options in this regard. Sixteen special status sites are located along the south-central

and southern alternative routes. The greatest level of impacts would have resulted on Kinlichee Tribal Park, Beale Wagon Road, Register Rock, Sanostee Chaco Protection Site, Toh-La-Kai Chaco Protection Site, and the National Register listed Canyon Padre Bridge.

WESTERN AREA

Eight separate Level 1 screening areas were evaluated in the western portion of the project area.

Level 1 Screening—Local Areas

- ***Mesa Butte, Additional Hill, Cedar Wash, Willow Camp, and Red Mountain areas (Links 1360, 1370, 1440, 1441, 1460, 1461, 1462, 1463, 1500, and 1540)*** These alternative links were initially established as a means of connecting into the Lava Point Substation site, and all of the alternatives made up of these links would require new corridor. Several of these alternatives crossed or were located in proximity to the Arizona Trail (existing or proposed), including Links 1500, 1540, 1460, and 1461. The historic Moqui Stage Station, a historical archaeological site along the Arizona Trail, is located adjacent to Link 1500. In addition, the local alternatives that incorporated these links are not as direct as other alternative routes along existing transmission lines within the area, and/or have the potential for higher impacts on Navajo traditional cultural places and visual resources. The length of alternatives incorporating these links, amount of new corridor, impacts on cultural and visual resources, and the elimination of the Lava Point Substation from further consideration (based on the screening results for the eastern area) led to the elimination of these links.
- ***Aubrey Valley and Pica areas (Links 1760, 1780, and 1840)*** All of these links were new corridor. Link 1760 in the Aubrey Valley was eliminated because of potential impacts on a large area where a population of black-footed ferrets, designated as nonessential and experimental, are being reintroduced by the FWS. Links 1780 and 1840 were eliminated based on higher density residential development and potential impacts on residential viewers than other local alternatives.
- ***Hackberry area (Links 2001, 2003, 2004, and 2005)*** The reason for the eliminating these links was to avoid direct impacts in the vicinity of Hackberry. There are two existing transmission lines in the area adjacent to residential development as well as archaeological and historical resources. An alternative that was located to the west of Hackberry was considered preferable.
- ***Marketplace area (Link 2160)*** Link 2160 included areas of new transmission line corridor and was eliminated based on higher levels of ground disturbance and potential impacts to visual resources than for Link 2140.

Level 2 Screening—Subregional Area

As a result of Level 2 screening in the western portion of the project area, links were eliminated in three areas.

- **Chino Valley area (Links 1820 and 1880)** Links 1820 and 1880 were located in new corridor. The alternative that incorporated these links had the greatest potential for higher impacts on sensitive viewers, as well as high impacts on the historic Beale Wagon Road and Route 66.
- **Hualapai area (Link 1940)** Link 1940 would have been in new corridor. It provided a north-south access route to get from the Aubrey Valley area to the south where it intersected Link 2000. The alternative that incorporated this link was at least 23 miles longer than other options and the links that connected with 1940 to the north included potential conflicts with the black-footed ferret management area (Link 1760).
- **Mead and Marketplace areas (Links 2100, 2120, and 2140)** Two crossings of the Colorado River, between Arizona and Nevada, were evaluated to access the Marketplace or the Mead Substation. The three links listed above allowed connections to either the Mead or the Marketplace Substation regardless of the river crossing selected. However, the use of Link 2120, connecting the southern river crossing with the Mead Substation, entailed an additional 20 miles and would have resulted in higher impacts on threatened and endangered species and big game. Connections from the northern river crossing into the Marketplace Substation (Links 2100 and 2120) required approximately one mile of new corridor, and would have resulted in higher impacts on soils, vegetation, and threatened and endangered species.

Level 3 Screening—Regional Areas

Ten alternative routes were identified in the western area including five routes between the Moenkopi and Marketplace substations, and five routes between the Moenkopi and Mead substations (listed below). Of the ten, four were eliminated from further consideration.

- | | |
|--|---|
| <ul style="list-style-type: none"> ■ Moenkopi to Marketplace <ul style="list-style-type: none"> - Northern 1 West (N1W) - Northern 2 (N2) - South-central 1 (SC1) (eliminated) - Southern 1 (S1) (eliminated) - Southern 2 (S2) | <ul style="list-style-type: none"> ■ Moenkopi to Mead <ul style="list-style-type: none"> - Northern 3 (N3) - Northern 4 (N4) - South-central 2 (SC2) (eliminated) - Southern 3 (S3) (eliminated) - Southern 4 (S4) |
|--|---|

The links of the alternative routes eliminated were 1700, 1770, 1860, 1900, and 1920.

Based on the interdisciplinary comparison, the routes retained in the western area included the preferred alternative for each individual resource (water, soils, biology, paleontology, land use, visual, archaeology and history, special status sites, and traditional cultural places). In general, these alternatives maximized the use of existing utility corridors including transmission lines and pipelines, while avoiding environmentally sensitive areas to the greatest degree possible.

The routes that were eliminated (SC1, SC2, S1, and S3) required the greatest amount of new corridor. New transmission line corridor along routes SC1 and SC2 totaled approximately 68 miles and included sensitive environmental crossings of the Aubrey Cliffs (Link 1700) and Aubrey Valley (Link 1770).

Routes S1 and S3 would have required approximately 100 miles of new corridor for each. Alternative routes N2 and N4 are identical to S1 and S3 (retained) from the intersection point of Links 1800, 1860, and 1980 into the Mead or the Marketplace Substation. The main difference is that N2 and N4 follow existing transmission line corridor for a much greater distance and would result in lower impacts on all resources. For this reason, N2 and N4 were identified as environmentally acceptable while S1 and S3 were eliminated. Specific resource issues and environmental impacts leading to the elimination of these alternatives included the following.

Biological Resources—The primary factor that influenced the elimination of the two south-central routes (SC1 and SC2) was the potential for impacts on the black-footed ferret management area. These two routes were considered the least preferable from a biological perspective due to potential conflicts with the reintroduction of ferrets in the Aubrey Valley along Link 1770 and the western portion of Link 1700. In particular, Link 1770 crossed through a substantial portion of an area in the Aubrey Valley where an experimental, nonessential population of the black-footed ferret is being reintroduced (March 1996). The presence of the ferrets would not prevent the construction of the line; however, agency biologists believe that construction of facilities including new access roads could be detrimental to the success of the program. Links 1700 and 1770 were located in areas of new corridor and would have traversed prairie dog colonies that have been surveyed and provided the basis for the Aubrey Valley as a reintroduction site.

Visual Resources—Alternatives S1 and S3 were the least preferred for visual resources. These alternatives had the greatest potential for combined high impacts to scenic quality and sensitive viewers based in part on the amount of new transmission line corridor construction, and also have the potential for high impacts on residential viewers.

Cultural Resources—Alternatives S1 and S3 had the greatest potential to adversely affect special status cultural resource sites. Each crossed the historic Beale Wagon Road three times and historic Route 66 twice.

FURTHER EVALUATION AND REVIEW

As mentioned above, the Level 3 comparison and screening of alternative routes resulted in identifying four alternative routes in the eastern area and six alternative routes in the western area to address in the DEIS. These alternative routes were initially ranked for environmental preferences and presented to the public and agencies for review during the summer of 1995. During and subsequent to this review, the three following key issues were identified in the eastern portion of the project area that prompted further evaluation:

- *Potential direct impacts on residences*—warranted refinement of land use data, identification of appropriate mitigation, and local realignments
- *Biological and cultural resources concerns*—public and agency comments prompted refinement of resource data and/or evaluation (particularly in the Chuska Mountains)

- *Reassertion of the Bennett Freeze*—led to adding and evaluating segments of alternative routes north of the Bennett Freeze area

Following the refinement of alternatives and identification of local options, the alternative route comparisons were reviewed.

Links eliminated as result of the refined land use data (Links 464, 500, 503, 505, 560, and 588)

During the initial screening and comparison of alternatives, potential impacts on residences and associated land uses could not be adequately determined. Additional analysis in selected areas resulted in localized realignments of alternative routes in three locations to avoid potential conflicts (areas of Kayenta, Dennehotso, and Big Whisker Well). These localized realignments were carried forward after an interdisciplinary team review, resulting in the elimination of Links 464, 500, 503, 505, 560, and 588.

Links eliminated as a result of the addition of Kaibito Plateau alternatives (Links 582, 584, 585, 589, 590, 1394, and 1395)

In September 1995, the Bennett Freeze (in the area west of the Hopi Reservation) was reasserted, potentially affecting the construction of NTP due to development restrictions. All of the eastern area alternative routes crossed the Bennett Freeze, so under the direction of Western and DPA, two new alternative routes and intermediate substations were identified that could facilitate implementation of NTP. These are located to the north of the Bennett Freeze area across the Kaibito Plateau. A Level 1 screening was conducted to compare these alternatives. As a result of the comparison, Links 1394 and 1395 were eliminated based on overall lower preference for all resources, with key concerns for impacts on views from residences and effects on Navajo traditional cultural places. Using the results from this analysis, a Level 2 analysis was conducted to evaluate the Glen Canyon, Kaibito, and Preston Mesa subroutes within the Lechee area. The Preston Mesa subroute (Links 582, 584, 585, 589, 590, and 591) was eliminated because of higher potential impacts on views from residences, views from the Great Western Trail, and effects on Navajo and Hopi traditional cultural places. As a result of the new Level 2 screening, N1E was eliminated, which included the Preston Mesa subroute. A new alternative route, Kaibito 1 (K1), was identified as environmentally preferred to N1E and replaced it as an eastern area alternative route.