CHAPTER 2 – ALTERNATIVES

This chapter describes and compares the alternatives that were evaluated to meet the project needs of increasing electrical system capacity and reliability in the Chino Valley area. The alternatives are presented here in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Two alternatives, the No Action Alternative and Proposed Action, were analyzed in detail. The No Action Alternative provides a scenario without utility improvements. The Proposed Action consists of transmission line and substation construction in combination with mitigation measures.

ALTERNATIVE DEVELOPMENT PROCESS

The alternative development process and study approach for the proposed facilities included environmental studies and public involvement activities conducted from September 2004 through September 2006. This approach was designed to identify, evaluate, and compare project alternatives based on an environmental analysis and agency and public input.

The study approach involved a systematic process of three phases. The first phase was the determination of a project study area and development of siting criteria to identify potential alternative locations for the 69kV subtransmission line. The study area was defined to ensure that all "reasonable" and "feasible" corridors and site locations could be studied. The proposed project study area (shown on Figure 1) is located in north-central Yavapai County. The study area includes land administered by the Forest Service, Arizona State Trust land, and private land.

In the second phase of the project, a regional inventory of resources was conducted to identify fatal flaws or constraints. The resources studied included natural, human, and cultural environments. This information was used to determine broad siting corridors for the location of alternative routes. To the extent possible, siting corridors utilized existing utility corridors and available access, avoided natural and cultural resource conflicts, and avoided currently subdivided and developed residential land.

In the final phase, the study team focused on the comparison and evaluation of alternative routes. The routes were compared to establish the overall preference of each alternative based on impacts to land use, visual, earth, biological, and cultural resources. The selected route was chosen based on the consideration of the following factors: presence of existing transmission lines, engineering requirements, constructability, cost, land acquisition, compatibility with the surrounding environment, and public input. A summary of the alternative route comparison process is provided in the project record.

ALTERNATIVES CONSIDERED IN DETAIL

Alternative 1 - No Action

If the proposed transmission line and substation are not constructed in order to bring a second source of power into the Chino Valley and Paulden area, the existing 69kV subtransmission lines would continue to serve the area. Under the No Action Alternative, there would be no ground disturbance or resource impacts; however, the purpose and need for the project would not be met.

Alternative 2 - Proposed Action

The Proposed Action alternative consists of the following:

- The construction of approximately 3 miles of 69kV electric subtransmission line on PNF land between the existing Yavapai Substation and the forest boundary.

The Forest Supervisor's decision will apply only to the PNF portion of the project.

The project would connect with additional facilities off of the forest[1], consisting of the following:

- Construction of up to approximately 17 miles of 69kV electric subtransmission line on state and private land between the forest boundary and a proposed substation in Chino Valley. The Proposed Action Alternate Option consists of an approximately 4.6-mile reroute of a portion of the route located on private land.

- Construction of a new substation on private land in Chino Valley. The substation site would be approximately 2 acres in size, including a cutback and safety zone around the substation.

The Proposed Action and Alternate Option are shown on Figure 1 and are described in detail below.

[1] Information regarding the portion of the project located off of the PNF is included only for explanatory reasons to describe the full extent of the proposed project. The PNF does not have authority over land outside of the national forest.

Subtransmission Line

The subtransmission line poles (Figure 2) would be made of self-weathering steel, between 55 and 65 feet tall and spaced between 250 and 500 feet apart. Self-weathering steel is preferred because it reduces visual impacts and the frequency of maintenance. Insulators would be dark gray and nonreflective wires would be used.

From the Yavapai Substation to where the line leaves the 230kV corridor, the line would be built for two circuits; the remainder of the line would be single-circuit. The portion of the line on the PNF would be strung with two circuits during project construction; the second circuit on the double-circuit portion of the line off of the PNF would be installed in the future when growth in the area dictates. Off of the PNF, the system would also be designed for future 12kV underbuild.

Proposed Action On the PNF

The portion of the proposed subtransmission line on PNF land is approximately 3 miles in length. The route begins on the PNF at the Yavapai Substation (Section 23, Township 16 North, Range 1 East) and follows the existing twin 500kV lines and a 230kV line out of the Yavapai Substation north to the intersection with the Cholla-Prescott 230kV line. The route then turns southwest and parallels the 230kV right-of-way for approximately 2 miles, to the forest boundary.

Existing system roads and the APS rights-of-way would be used for access. Rubber-tired and/or tracked vehicles would be used. There would be no upgrading of existing roads.

Proposed Action off the PNF

Approximately 17 miles of the proposed subtransmission line are located on private and State Trust land. After exiting the PNF at Milepost 3.2, the route continues parallel to the 230kV right-of-way, crossing State Trust land, vacant private land, and a residential area. At Milepost 11.5 the route leaves the 230kV corridor to head due west along the northern boundary of a section of State Trust land for approximately 0.3 mile. The route then heads north on the east side of Granite Creek to Perkinsville Road. From there the route continues westerly, paralleling the north side of Perkinsville Road for approximately 2 miles and removed approximately 30 feet from the edge of the road edge. The route then goes north for 1.1 miles on Old Home Manor Road to the Road 4 North alignment, and then follows the Road 4 North alignment west for 1 mile, to the substation site. A portion of the route parallel to Perkinsville Road and the route through the Old Home Manor area would be co-located with existing electrical distribution lines and have 12kV electric underbuild and possible communications underbuild. In areas with no existing access, overland travel with rubber-tired and/or tracked vehicles would be used.

Figure 2
8 ½ x 11 b/w
Proposed Structures Diagram

Alternate Option Off of the PNF

The approximately 4.6-mile Alternate Option diverges from the proposed route at Milepost 9.0. The Alternate Option route turns north/northwest and parallels a natural gas pipeline for 3.4 miles to Perkinsville Road. The route then parallels the north side of Perkinsville Road for 1.2 miles to where it meets the proposed route near Forest Service Road 638. The remainder of the route is the same as described above.

Right-of-way easements would be acquired for the line. Typically, the right-of-way width for the transmission line would be between 40 and 50 feet. This is required to meet clearance requirements for electric safety codes to provide working space for maintenance activities and to protect adjacent uses from electrical hazards. Easements and other property rights would be acquired from private property owners, ASLD, and the Forest Service to construct the new transmission line right-of-way. APS would compensate private property owners for new easements.

Substation

The proposed substation would require an area approximately 300 feet by 300 feet (2 acres). Site preparation may include cut-and-fill, grading, and recontouring. A security fence would be installed around the substation facilities. The fence would be a 10-foot-tall chain link fence with colored slats. Three strands of barbed wire would be located on top of the fence, bringing the total height of the fence to 11 feet. The proposed substation would be interconnected with the new 69kV subtransmission line and existing 12kV distribution system. The substation would be an unmanned facility monitored and controlled from the APS Energy Control Center in Phoenix.

As described in Chapter 1, construction of the Proposed Action would result in an additional source of power for the Chino Valley area. The introduction of another source of electrical power is expected to provide public benefits by supporting future load growth and increased capacity. The 69kV transmission line and substation would be in operation year-round to provide reliable power to the community.

ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED STUDY

The following alternatives were considered but eliminated: Alternative Transmission Line Routes, Energy Conservation, and Alternative Transmission Technologies. These alternatives, described below, were eliminated from detailed study after initial consideration because they would not adequately meet the project purpose and need.

Alternative 3 - Transmission Line Routes

Approximately 23 miles of an alternative route on the PNF was considered but eliminated from further study for reasons including system engineering needs, construction costs, and potential biological issues.

An alternative transmission line configuration would have connected the Yavapai Substation with the Paulden Substation north of Chino Valley. Two routes were considered for this configuration. Both of these routes would have utilized the same approximately 23-mile-long corridor on the PNF before separating outside of the forest. The routes would have paralleled the existing twin 500kV lines for approximately 17 miles, to the existing Coconino-Willow Lake 69kV line northeast of Chino Valley, then followed the Coconino-Willow Lake line for approximately 7 miles as a double-circuit structure (approximately 6 of these miles would be on NFS land). One route would have then cut west to parallel the Burlington Northern Santa Fe Railway for approximately 4 miles, to the Paulden Substation. The second route would have continued parallel to the Coconino-Willow Lake line for approximately 3 more miles before following section lines for approximately 4 miles, to the Paulden Substation. These routes were eliminated due to a change in systems design that resulted in the decision to route the line to a new substation in the center of Chino Valley to better accommodate anticipated future growth in central Chino Valley.

A number of alternative routes were considered for the portion of the route off of the PNF across state and private lands around Chino Valley. These routes were considered but eliminated due to system engineering concerns and preferences expressed by the both the Town of Chino Valley and the ASLD.

Alternative 4 - Energy Conservation

Energy conservation is the more efficient use of electricity by customers. APS is implementing and conducting several programs to promote various energy conservation measures. These include residential appliance and home efficiency programs, promotion of energy efficient air conditioning and heat pump units, commercial and industrial thermal storage, efficient lighting, efficient motors, and energy efficient systems for entire buildings.

Although energy conservation can somewhat reduce energy consumption, this alternative would only forestall the increase in energy demands for a short period of time. Customer growth in the Chino Valley area has increased energy consumption. APS currently serves approximately 5,822 customers in the area, and expects their customer base to exceed 7,431 in the next five years. Because energy conservation is voluntary on the part of the customer, conservation cannot be relied upon as a means of improving the reliability of service. This alternative would fail to meet the purpose and need for the project since it would not improve system reliability or provide consistent increased capacity. As a result, this alternative was eliminated from consideration.

Alternative 5 - Transmission Technologies

Voltage options and underground construction were considered and are described below.

Voltages: The project is proposed as a single-circuit 69kV subtransmission line. Other voltage options are higher—115kV and up. These higher voltage lines provide bulk transfer capability, but would provide an excessive amount of power needed for the area. Alternative transmission line voltages would not fulfill the purpose and need of the Proposed Action and were eliminated from further consideration.

Underground construction: Underground systems typically have been constructed under circumstances of short distances in which overhead lines are not feasible (e.g., in the vicinity of airports, urban centers). Underground line construction is often preferable to overhead lines due to reduced visual impacts after installation. However, the clearing, excavation, and access road construction associated with underground construction would create some visual impacts.

Cost is the key factor in eliminating this alternative. APS' experience shows that costs for an underground 69kV subtransmission line may run 10 times higher than equivalent overhead lines. Costs are reduced for lower voltage cables (e.g., 12kV and lower) for many reasons, including cost of cable, trench, and conduit. These same factors for 69kV underground installation are much more complex and very expensive due to the dissipation of heat factor for the higher voltage line and the requirement of a wider right-of-way for the separation of adjoining facilities. Although underground lines are less likely to be affected by weather, maintenance costs are typically greater than the equivalent overhead lines, since outages are more difficult to locate and repair. Underground lines are vulnerable to washouts and incidental excavation. Outages for underground lines could last days or weeks while the problem is being located and repaired. Overhead lines suffer outages more often, but they can usually be corrected within hours.

For the above reasons, undergrounding the proposed route (or portions of it) was eliminated from further study.

PROJECT CONSTRUCTION, OPERATION, AND MAINTENANCE

Construction of the Proposed Action would occur during an eight-month period and require between 10 and 20 workers. Construction includes the following activities listed in sequential order below.

Pre-Construction Activities

Engineering Surveys – Before construction surveying begins, required permits would be obtained to survey on federal and state lands or rights-of-entry for privately owned land. The construction survey would consist of centerline location, pole location, right-of-way boundaries, and access roads.

Pole locations and the proposed centerline would be flagged and staked. Surveyors would use a 4-wheel-drive vehicle on Forest Service roads and would walk between pole locations as they survey and stake the line.

On-ground investigations would be completed to accurately locate the centerline of the right-of-way on NFS land. The exact centerline would be chosen to best fit within the existing PNF utility corridor, implement design criteria, and to satisfy the mitigation measures in the EA.

Cultural Resource Surveys – Forest Service-permitted contractors (EPG) have surveyed the proposed and alternate routes for cultural resource identification. Any cultural property that would be directly or indirectly impacted would be subject to evaluation and determination through Section 106 consultation, as required by the NHPA. Section 106 of the NHPA requires that "a proposed Federal or federally assisted undertaking … take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register." Project engineers would work with project archaeologists to avoid or minimize impacts to any identified cultural resources by relocating the line or poles where feasible.

Biological Surveys – Biological surveys for wildlife and plant species have been conducted for the project study area. A Wildlife Specialist Report and Biological Assessment and Evaluation have been completed for the portion of the proposed project on PNF land. A noxious weed survey would be conducted prior to construction-related activities, and mitigation measures (see Table 2-2) would be applied to prevent the spread of noxious weeds.

Geotechnical Investigation – A geotechnical investigation would be conducted at the proposed substation site to determine subsurface soil conditions. This would involve drilling test boreholes using a drilling rig.

Vegetation Clearing – Vegetation clearing along the right-of-way would be conducted to remove trees and brush that would interfere with the construction, operation, and maintenance of the proposed facilities. Topping or removal of mature vegetation under or near the conductors would be done to provide adequate electrical clearance as required by National Electrical Safety Code (NESC) standards.

Construction Activities

This section describes the procedures, types of equipment, and vehicles necessary for construction of the proposed project.

Subtransmission Line Construction

Construction activities include the development of temporary laydown yards, pole site clearing and hole excavation, pole framing and setting, and conductor installation.

Laydown Yards – Three temporary construction laydown yard sites would be needed to serve as parking for construction vehicles, equipment, and construction material storage. The only site on NFS land would be located within the Yavapai Substation fenced area. A second site would be located in Section 36, Township 16 North, Range 2 North, and a third site would be located at the proposed CV-3 Substation site in Old Home Manor. Typically, laydown yards are approximately 300 feet by 300 feet in size. Facilities would be fenced and their gates locked. There would be no unattended overnight fuel storage on the right-of-way or in the laydown yards. There would be no earth-moving activities used to prepare these sites; however, ground disturbance and vegetation removal could occur. Upon completion of the proposed project, the middle laydown yard would be reclaimed.

Pole Site Clearing and Hole Excavation – The clearing of some natural shrub and grass vegetation may be required at pole sites; however, selective clearing would be performed only when necessary to provide for construction of the proposed project. Excavations for poles are made with a metal-tracked or rubber-tired vehicle with a power auger. The hole excavation and pole installation require vehicle access to the site.

Pole Framing and Setting – Pre-framed poles would be transported to each pole site by truck or helicopter and rigged with stringing sheaves to prepare for conductor installation. The poles are placed upright by a rubber-tired boom truck and then the hole is backfilled.

Conductor Installation – After the poles are set, a pilot line is pulled (strung) from pole-to-pole by an all-terrain vehicle or helicopter and threaded through the stringing sheaves at each pole. Then the conductor is attached to the pilot line and pulled through the stringing sheaves by a Gator Utility Vehicle. This process is repeated until the conductor is pulled through all of the sheaves.

The conductor is strung using powered pulling or tensioning equipment at one end and powered braking or tensioning equipment at the other end. Tensioning and pulling sites are approximately 10,000 feet apart or where the power line makes a turn of 45 degrees or greater. The tensioning site is an area approximately 100 feet by 200 feet. Tensioners, line trucks, wire trailers, and tractors, which are needed for stringing and anchoring the ground wire or conductor, are located at this site. The tensioner, along with the puller, maintains tension on the ground wire or conductor. Maintaining tension preserves ground clearance and is necessary to avoid damage to the ground wire, conductor, or any objects below them during the stringing operation.

The pulling site requires two-thirds the area of the tension site. A puller and line trucks, which are needed for pulling and temporarily anchoring the ground wire and conductor, will be located at these sites.

The final step involves removing the stringing sheaves and attaching the wire permanently to the insulators. This would require one trip with a 4-wheel-drive boom truck.

For public protection during wire installation, safety measures such as barriers, flagmen, or other traffic control devices will be used for crossing public roadways (if applicable).

Substation Construction

The proposed substation would require an area approximately 300 feet by 300 feet (2 acres). Site preparation may include cut-and-fill, grading, and recontouring. A security fence would be installed around the substation facilities. The fence would be a 10-foot-tall chain link fence with colored slats. Three strands of barbed wire would be located on top of the fence, bringing the total height of the fence to 11 feet. The proposed substation would be interconnected with the new 69kV subtransmission line and existing 12kV distribution system. The substation would be an unmanned facility monitored and controlled from the APS Energy Control Center in Phoenix.

Table 2-1 outlines the workforce and equipment requirements for each phase of construction.

TABLE 2-1
WORK FORCE REQUIREMENTS AND EQUIPMENT

Task	Equipment
Right-of-way Survey	2 pickups (equipped with 4-wheel-drive)
Access Road Construction	1 rubber-tired front loader 2 pickups (equipped with 4-wheel-drive) 1 water truck
Pole Excavation	2 power augers 2 pickup trucks (equipped with 4-wheel-drive) 2 line trucks
Pole Transport	1 helicopter 1 line truck (equipped with 4-wheel-drive)
Pole Placement	2 boom trucks (equipped with 4-wheel-drive) 2 pickup trucks (equipped with 4-wheel-drive)
Conductoring	1 helicopter with fly ropes 1 drum puller 1 splicing truck 1 double-wheeled tensioner 1 wire reel trailer 1 sagging equipment 2 pickup trucks (equipped with 4-wheel-drive) 2 bucket trucks
Road Restoration	1 bulldozer (D-6) 1 pickup truck (equipped with 4-wheel-drive) 1 tractor (equipped with dragging chain)
Clean-up	2 pickup trucks (equipped with 4-wheel-drive)

TABLE 2-1 WORK FORCE REQUIREMENTS AND EQUIPMENT	
Task	**Equipment**
Substation Construction	1 yard crane 4 pickup trucks 1 water truck 1-3 concrete trucks 1-3 dump trucks 1-2 backhoes 1 trencher 1 power auger 1 bucket truck 1 man-lift

Cleanup

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash, including stakes and flags, would be removed from the sites and disposed of in an approved manner. Oils and fuels would not be dumped along the line. Oils or chemicals would be hauled to an approved site for disposal. No open burning of construction trash would occur on Forest Service-administered land.

Reclamation

Following construction and cleanup, reclamation would be completed. The disturbed surfaces would be restored to original contour of the land surface to the extent practical. Water diversions would be constructed along the right-of-way as needed to control surface water and soil erosion. Soils compacted by heavy equipment would be broken up with tines to loosen the top 3 inches of soil. Appropriate site-specific seed mixes would be used where conditions vary. Salvaged native plants would be used for revegetation, where feasible, along with seeding using Forest Service recommended seed mixes.

A weed-free seed mix would be used. Seed would be planted from March to May, or as directed by the Forest Service, following power line construction. Seed would be planted using the seed mix and method directed by the Forest Service.

Periodic evaluations of reclamation would be completed by APS and the Forest Service to ensure that reseeding and replanting are successful. Areas determined to be unsuccessful within two years after completion of construction would be reseeded or revegetated as directed by the Forest Service.

MITIGATION MEASURES

Mitigation measures were developed to reduce, avoid, and/or compensate for the potential impacts the proposed activities may cause. Project design and implementation of mitigation measures (Table 2-2) would minimize potential environmental impacts. As part of the standard operating procedures, mitigation measures would be implemented throughout the lifetime of the project. Application and effectiveness of mitigation measures along the proposed route is described in the resource impact assessments in Chapter 3.

In addition to specific mitigation measures prescribed for the action alternative, all management activities implemented are required to follow Forest Plan Standards and Guidelines, Best Management Practices (BMPs), and any other applicable Forest Service policy.

TABLE 2-2
MITIGATION MEASURES REQUIRED FOR THE PROPOSED ACTION ALTERNATIVE

No.	Objective	Mitigation Measure
	Soil and Water	
1	Prevent contamination of waters from accidental spills.	A Spill Contingency Plan and Spill Prevention Control and Countermeasure (SPCC) Plan will be prepared to prevent oil products from entering the navigable waters of the United States. Oils or chemicals will be hauled to an approved site for disposal. Oil containment berms will be constructed in the substation in case of emergency.
2	Protect surface and subsurface water quality from physical, chemical, and biological pollutants resulting from activities that are under special use permit.	The special-use permit, under which APS operates, shall detail the conditions they must meet to continue operating, including measures necessary to comply with state and federal water quality standards. APS shall conform to all applicable state and local regulations governing water quality and sanitation.
3	Prevent compaction, rutting, and gullying that may result in site degradation, sediment production, and turbidity.	If soil moisture will cause rutting by construction equipment (greater than 2 inches in depth) for a length greater than 25 feet, the movement of construction equipment will not be allowed on the right-of-way, access roads, or at the laydown yards or other areas for a period of 48 hours or as directed by the Forest Service.
4	Comply with state and federal water quality standards by minimizing soil erosion through the stabilizing influence of vegetative ground cover.	This is a corrective practice to stabilize the soil surface of a disturbed area. The vegetation selected will be a mix of species that is best suited to meet the erosion control objective with consideration for range, wildlife, timber, or fuels management objectives. Fertilization, along with placement of a tackifier, jute netting, or other soil surface stabilizing material, may be necessary to ensure vegetation is established.
5	Minimize vegetation and surface disturbance outside of the right-of-way.	All construction vehicle movement outside of the right-of-way will be restricted to predesignated access areas, existing roads, or as approved by the Forest Service.
6	Minimize soil erosion.	All construction and maintenance activities will be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks. All existing roads will be left in a condition equal to or better than their condition prior to construction of the proposed project.

TABLE 2-2 MITIGATION MEASURES REQUIRED FOR THE PROPOSED ACTION ALTERNATIVE		
No.	**Objective**	**Mitigation Measure**
7	Minimize construction of new access roads and ground disturbance.	Off of NFS lands, existing access roads will be used to the extent possible. In areas with no existing access, overland travel with rubber-tired and/or tracked vehicles will be used. On NFS lands, existing system roads and APS rights-of-way would be used for access.
Heritage and Biological Resources		
8	Comply with state and federal laws regarding antiquities and plants and wildlife.	Prior to construction, all construction personnel will be instructed on the protection of cultural and ecological resources. To assist in this effort, the instruction will address: (a) federal and state laws regarding antiquities and plants and wildlife, including collection and removal; and (b) the importance of these resources and the purpose and necessity of protecting them.
9	Minimize impacts and disturbance to sensitive features.	To minimize disturbance of sensitive features in designated areas, structures and access roads will be sited so as to avoid sensitive features such as, but not limited to, riparian areas, water courses, residential uses, and cultural sites, to the extent possible. Avoidance may be accomplished by spanning sensitive features or realigning the route, as approved by the Forest Service. Conductors will span sensitive features, within limits of standard structure design. Known archaeological resources will be barricaded during construction activities. An archaeological monitor will be present during construction activities within 100 feet of eligible sites.
Visual Quality		
10	Avoid permanent markings and minimize ground disturbance.	The limits of construction activities will be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents will be applied to rocks or vegetation to indicate survey or construction activity limits. Flagging may be used to delineate these areas.
11	Reduce visual impacts and structure contrast.	The poles will be made of self-weathering steel. Self-weathering steel is preferred by the Forest Service to reduce visual impacts and frequency of maintenance. Insulators will be dark gray and nonreflective wires will be used.
Air Quality		
12	Comply with state and federal laws.	All requirements of those entities having jurisdiction over air-quality matters will be adhered to and any necessary permits for construction activities will be obtained.
Noise		
13	Minimize noise and interference issues.	APS will respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigation measures.
Noxious Weeds		
14	Minimize the spread of noxious weeds.	To minimize the spread of noxious weeds, all construction vehicles and equipment will be sprayed before coming onto NFS land. A high-pressure hose will be used to clear the undercarriage, tire treads, grill, radiator, and beds of any mud, dirt, and plant parts that may potentially spread the seeds of noxious plants. Should there be concentrated areas of noxious weeds within the study area, additional spraying may be required to prevent the contamination of uninfested areas. Seeds utilized for the reclamation of disturbed areas will be certified weed free.

MONITORING NEEDS

All projects require periodic monitoring of resources or activities on a representative sample basis in order to establish long-term needs, assess the impacts of land management activities, determine how well objectives have been met, and check compliance with established standards. Most of the monitoring activities would be ongoing as the project progresses through its various stages. The mitigation measures described previously include some monitoring activities. Table 2-3 describes monitoring activities to be conducted for the project.

TABLE 2-3
MONITORING MEASURES REQUIRED FOR THE PROPOSED ACTION ALTERNATIVE

Objective	Monitoring Measure
Heritage Resources	
Minimize impacts to archaeological sites.	Maintain compliance with the NHPA. Use an archaeological monitor for construction activities within 100 feet of eligible sites.
Noxious Weeds	
Minimize spread or introduction of noxious weeds.	An evaluation of reclamation will be completed by APS and the Forest Service to ensure that reseeding and replanting are successful. Areas determined to be unsuccessful within two years after completion of construction will be reseeded or revegetated as directed by the Forest Service.

COMPARISON OF ALTERNATIVES

The following table (Table 2-4) displays a summary response to the purpose and need, Forest Plan guidance, and environmental effects of the No Action and Proposed Action alternatives. Environmental consequences of alternatives considered in detail are discussed in Chapter 3.

TABLE 2-4
SUMMARY OF ALTERNATIVES

	Alternative 1 No Action	Alternative 2 Proposed Action
Purpose and Need		
Provide capacity for projected load growth in the area	No	Yes
Increase reliability by extending additional transmission sources	No	Yes
Provide a looped distribution system and the ability to restore power in a timely manner in the event of an outage	No	Yes
Upgrade existing facilities	No	Yes
Provide additional bulk power to the area and develop 69kV system for meeting long-term needs	No	Yes

TABLE 2-4 SUMMARY OF ALTERNATIVES		
	Alternative 1 No Action	**Alternative 2 Proposed Action**
Community Issues		
Minimize impact in community center/gateway area	Yes	Route is collocated with existing distribution lines through Old Home Manor, and then runs on northern perimeter of Old Home Manor.
Forest Plan Compliance		
Forest-wide Direction: "Authorizations for special uses may be issued to qualified applicants when the proposed use: (a) fulfills a demonstrated special need without unduly infringing on the use by the general public; (b) is in accordance with an approved implementation plan (where called for) and will not cause adverse impacts on the national forest and its resources which cannot be fully mitigated; (c) does not serve a function that can be provided by private enterprise off national forest lands; and (d) is complimentary to Forest Service and management area objectives, programs and purposes."	N/A	Yes
Forest-wide Direction: "Locate needed facilities within existing corridors where feasible."	N/A	Yes
Management Area Direction: *Management Area 2, Woodland.* Emphasis will be on wildlife management, improving and maintaining watershed conditions, and on interpretation. Range management will generally be at the current level (except in the desert shrub-grass vegetation areas).	N/A	Yes
"Where new rights-of-way are indicated, scenic, recreational, fish and wildlife values must be evaluated in the selection process."	N/A	Yes
Key Environmental Effects		
Land Use and Recreation Resources	No impacts	Minimal impacts – potential recreation access restrictions could occur during construction on PNF land.
Visual Resources	No impacts	Minimal impacts – potential impacts would be reduced through the use of self-weathering structures and nonspecular conductors.

TABLE 2-4 SUMMARY OF ALTERNATIVES		
	Alternative 1 No Action	**Alternative 2 Proposed Action**
Cultural Resources	No impacts	Minimal impacts – careful selection of pole locations, mitigation, and monitoring measures would be used to ensure minimal impacts to the resources.
Biological Resources: ■ Vegetation	No impacts	Minimal impacts – some vegetation clearing would occur for right-of-way across PNF and state land.
■ Wildlife and Native Fish	No impacts	Minimal impacts – through mitigation measures, wildlife impacts would be avoided to the extent possible. No native fish would be impacted due to lack of habitat in project area.
■ Federally Listed Special Status Species and/or Designated Critical Habitat (Threatened, Endangered, and Candidate Species)	N/A – No Federally Listed Threatened, Endangered, or Candidate Species or Designated Critical Habitat are present.	N/A – No Federally Listed Threatened, Endangered, or Candidate Species or Designated Critical Habitat are present.
■ Federal Species of Concern	No impacts	Minimal impacts – very minor impacts to prey species and foraging areas could occur. A minor reduction in habitat could occur for other listed species.
■ MIS Species	No impacts	Minimal impacts – some loss of cover and habitat for mule deer could occur.
■ Regional Forester's List of Sensitive Species	No impacts	Minimal impact – some increased competition from invasive plants and some limited loss to species could occur for the Arizona phlox, Hualapai milkwort, Verde Valley sage, and/or the Flagstaff pennyroyal, if any of these species occur within the project area.
■ Migratory Birds	No impacts	Minimal impacts
Earth and Water Resources	No impacts	Minimal impacts – mitigation measures would limit potential erosion from construction activities, and water features would be avoided.
Air Quality and Noise	No impacts	Minimal impacts – some noise and dust impacts will occur during construction.