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BEFORE THE  
POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE  
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Arizona Corporation Commission  
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Case No. 128

In the matter of the Application of Arizona Public Service Company, in conformance with the requirements of Arizona Revised Statutes 40-360, et seq., for a Certificate of Environmental Compatibility authorizing the Palo Verde Hub to TS-5 500kV Transmission Project, which includes a 500kV transmission line and associated facilities and interconnections originating from either the Palo Verde Nuclear Generating Station Switchyard, Section 34, Township 1 North, Range 6 West, G&SRB&M, or a new switchyard at the Arlington Valley Energy Facility, Section 17, Township 1 South, Range 6 West, G&SRB&M, each located south of Interstate 10 near Wintersburg Road in an unincorporated area of Maricopa County, Arizona, to the TS-5 Substation near the Hassayampa Pumping Plant along the Central Arizona Project Canal, in the Town of Buckeye, Maricopa County, Arizona, at Section 29, Township 4 North, Range 4 West, G&SRB&M.

APPLICATION FOR  
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

# ● PALO VERDE HUB TO TS-5 SUBSTATION 500kV TRANSMISSION PROJECT



## APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

PREPARED FOR

ARIZONA CORPORATION COMMISSION

ARIZONA POWER PLANT AND TRANSMISSION  
LINE SITING COMMITTEE

SUBMITTED BY



ARIZONA PUBLIC SERVICE

MAY 2005

# **Application for a Certificate of Environmental Compatibility**

## **Palo Verde Hub to TS-5 500kV Transmission Project**

Prepared for:

**Arizona Power Plant and  
Transmission Line Siting Committee**

Submitted by:

**Arizona Public Service Company**

**Date: May 2, 2005**

**Case No. 128**

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## LIST OF ACRONYMS AND ABBREVIATIONS

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AC	alternating current
AGFD	Arizona Game and Fish Department
APPTLSC	Arizona Power Plant and Transmission Line Siting Committee
APS	Arizona Public Service Company
ASLD	Arizona State Land Department
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
dBA	decibels, A-Weighted
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
CEC	Certificate of Environmental Compatibility
EA	Environmental Assessment
EPG	Environmental Planning Group
G&SRB&M	Gila and Salt River Baseline and Meridian
I-10	Interstate 10
kV	kilovolt
MFP	Management Framework Plan
PV Hub	Palo Verde Hub
PVNGS	Palo Verde Nuclear Generating Station
RMP	Resource Management Plan
SCE	Southern California Edison
SRP	Salt River Project
WAPA	Western Area Power Administration

# INTRODUCTION

## INTRODUCTION

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Arizona Public Service Company (APS), as the project manager and Applicant, on behalf of itself and Salt River Project Agricultural Improvement and Power District (SRP) and the Central Arizona Water Conservation District (CAWCD) as operator of the Central Arizona Project (CAP) Canal, is seeking a Certificate of Environmental Compatibility (CEC) for their proposed Palo Verde Hub (PV Hub) to TS-5 500 kilovolt (kV) Transmission Project (PV Hub to TS-5 Project).

The project is a segment of larger, regional transmission plans identified through the Southwest Area Transmission (SWAT) regional planning group. The project is identified as an important component in ensuring a reliable transmission system and increasing transmission capability out of the PV Hub in the Third Biennial Transmission Assessment (2004-2013) issued by the Arizona Corporation Commission.

### PROJECT OVERVIEW

The PV Hub to TS-5 Project will originate at either the Palo Verde Nuclear Generating Station (PVNGS) Switchyard, located south of Interstate 10 (I-10) along Wintersburg Road, or a new 500kV switchyard to be constructed at the Arlington Valley Energy Facility (Arlington Power Plant), located south of I-10 along Elliot Road. The actual location for the interconnection with the PV Hub will be determined based on APS' evaluation of system reliability and interconnection issues. Thus, APS (Applicant) requests that the CEC include both alternatives for the PV Hub interconnection. The northern termination of the PV Hub to TS-5 Project will be the TS-5 Substation, located near the CAP Canal and the Hassayampa Pumping Plant, west of 291<sup>st</sup> Avenue and north of the Beardsley Road alignment in Buckeye, Arizona. The TS-5 Substation site has been approved in Case 127 by the Arizona Power Plant and Transmission Line Siting Committee (APPTLSC).

### PROPOSED ROUTE

The Proposed Route for the PV Hub to TS-5 Project will originate at the PV Hub and proceed west and north, paralleling the existing Palo Verde-Devers No. 1 and Harquahala-Hassayampa 500kV transmission lines for approximately 14 miles to the proposed Harquahala Junction Switchyard, located in Section 25, Township 2 North, Range 8 West near 451<sup>st</sup> Avenue and the Thomas Road alignment. The route then proceeds north for approximately 5 miles, paralleling the Palo Verde-Devers No. 1 500kV transmission line across I-10 and the CAP Canal, at which point the route would turn easterly and be on the north side of the CAP Canal. There the route would parallel the north side of the CAP Canal for approximately 24 miles to the TS-5 Substation. The Proposed Route would be located entirely within Bureau of Land Management (BLM)-designated utility corridors when traversing BLM-managed land (approximately 26 miles, or 60% of the 43-mile route).

## PROPOSED ALTERNATE ROUTE

The Applicant has identified a single Proposed Alternate Route to provide the APPTLSC with an additional option for the location of the proposed transmission line route. The Proposed Alternate Route shares the same alignment as the Proposed Route previously described, with the exception of an approximately 9-mile segment immediately north of the CAP Canal (Link 70). In this area, the Proposed Alternate Route would be located approximately ½ mile north of the CAP Canal. All other segments of the Proposed Alternate Route would be the same as the Proposed Route.

## CONSTRUCTION OPTIONS

The Proposed Route or Proposed Alternate Route may be built in two phases depending on the system option selected. The first option is to build the transmission line in its entirety with a projected in-service date of 2007. The second system option could be constructed in two phases with the second phase in-service date to be determined through further technical studies. The two options are detailed below.

The first construction option for the Proposed Route or Proposed Alternate Route would be to construct the project continuously from the PV Hub to the TS-5 Substation. The in-service date for this option is projected for 2007. The Harquahala Junction Switchyard would not be built as part of this system option.

The second construction option for the Proposed Route or Proposed Alternate Route would be to build the proposed Harquahala Junction Switchyard and construct the project in two phases. The first phase of this option would originate at the Harquahala Junction Switchyard and would terminate at the TS-5 Substation, a distance of approximately 29 miles. The existing Harquahala–Hassayampa 500kV transmission line would be cut-in at the proposed Harquahala Junction Switchyard. The existing Harquahala–Hassayampa 500kV transmission line between the Harquahala Junction Switchyard and the PV Hub would be utilized until the second phase of the project is needed. The second phase of this option would consist of a new 500kV transmission line from the Harquahala Junction Switchyard back to the PV Hub and would be constructed when needed.

## **PROJECT NEED**

The proposed project is needed to support the increased development and growth occurring and anticipated in the western Phoenix metropolitan area. This project also will strengthen the entire APS Phoenix metropolitan area transmission system comprised of APS, SRP, and Western Area Power Administration (WAPA) transmission facilities by providing an additional electrical transmission source to the valley. Additionally, the proposed line will increase import transmission capability into the Phoenix metropolitan area as well as increase export transmission capability from the PV Hub. This project also allows the CAWCD to access the PV Hub to obtain energy to service its pumping loads. The projected need date for the proposed 500kV line is 2007.

## **ENVIRONMENTAL STUDIES AND ROUTE SELECTION PROCESS**

In early 2003, APS began working closely with the Phoenix Field Office of the BLM to identify potential future utility corridors and substation sites in the western Phoenix metropolitan area for inclusion in the updates to the Bradshaw-Harquahala Resource Management Plan and the Phoenix South and Sonoran Desert National Monument Plan. This regional analysis considered potential alternative transmission line corridors and substation sites within a regional area including the entire study area defined for the PV Hub to TS-5 Project. The analysis considered land ownership, land management designations, and existing transmission lines and utility corridors. The results of the study were submitted to the BLM and included a ranking, by priority, of the utility corridors in the regional study area. The corridor within which the Proposed Route and Proposed Alternate Route for the PV Hub to TS-5 Project are located was identified as the preferred utility corridor in the study.

In late 2003, APS, in conjunction with their environmental consultant, Environmental Planning Group (EPG), studied and evaluated potential alternative routes and switchyard/substation siting areas as part of the initial scoping for the development of the Environmental Assessment (EA) for the PV Hub to TS-5 Project. Potential route alignments and switchyard/substation locations were identified by minimizing siting options in constrained areas, such as near schools and residences, and maximizing siting opportunities that take advantage of existing linear features, such as utility corridors, major transportation corridors, canals, and railroads. This review process identified a network of approximately 200 miles of alternative routes within a regional study area. The Proposed Route and Proposed Alternate Route had the least amount of environmental impact, when compared to the other alternative routes, while still meeting engineering system requirements and cost considerations. Both of the proposed routes were evaluated as part of the Proposed Action in the EA (see Exhibit B-1 under separate cover), and approved by the BLM. For additional information on the environmental studies prepared for this application refer to Section 6, Description of Environmental Studies, of this application.

## **PUBLIC INVOLVEMENT OVERVIEW**

A public information program for the PV Hub to TS-5 Project was conducted during the preparation of the EA and CEC to establish and maintain open communication with the public. The public involvement program included public meetings, informational mailings, and the provision of other resources of information such as a project website and phone line. By providing the public with multiple opportunities to access project information and relay comments, the project team was able to educate the public about the proposed project, as well as gather public input, identify issues, and respond to those issues through the planning process. Exhibit J contains additional details of public involvement activities for the PV Hub to TS-5 Project.

# APPLICATION

APPLICATION FOR  
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

(Pursuant to A.R.S. § 40-360.03 and 40-360.06)

1. Name and address of Applicant:

Arizona Public Service Company  
P.O. Box 53933  
Phoenix, Arizona 85072-3933

2. Name, address and telephone number of a representative of Applicant who has access to technical knowledge and background information concerning this application, and who will be available to answer questions or furnish additional information:

Paul Herndon  
Project Manager  
Transmission Line and  
Facility Siting Group  
Arizona Public Service  
P.O. Box 53933, Mail Station 4609  
Phoenix, Arizona 85072-3933  
(623) 932-6729

3. Dates on which Applicant filed a Ten Year Plan in compliance with A.R.S. § 40-360.02, in which the facilities for which this application is made were described:

2002 (*Referred to as the Palo Verde Hub to Table Mesa Project in the 2002 filing*)  
2003  
2004  
2005

4. Description of the proposed facilities:

4.1 Description of electric generating plant:

(not applicable)

4.2 Description of the proposed transmission line:

4.2.1 General Description:

4.2.1.1 Nominal voltage for which the lines are designed:

525kV alternating current (AC) single circuit

4.2.1.2 Description of proposed structures:

The transmission line will be constructed using steel lattice and tubular steel monopole structures. Links 10 or 20, 30, and 50 will be constructed using steel lattice structures. Links 60/70, 80, 90, 100, 110, and the beginning of Link 120 will be constructed using steel lattice or pole structures. The remaining portion of the transmission line (Links 120 and 130) will be constructed with single-circuit steel pole structures.

The structures would be approximately 130 to 150 feet above ground, depending on the span length required with a maximum height of 195 feet. The span length between structures would vary between 800 to 1,400 feet, according to terrain conditions and to achieve site-specific mitigation objectives such as matching structure locations with existing transmission lines. The steel lattice and tubular steel pole structures would have a dulled finish and conductors would have a low-reflective (non-specular), dulled finish to reduce visibility.

Exhibit G contains conceptual illustrations of the proposed structures to be utilized for the project.

4.2.1.3 Description of proposed switchyards:

The PV Hub to TS-5 Project will originate at either the PVNGS Switchyard, located south of I-10 along Wintersburg Road, or a new 500kV switchyard to be located on a site up to 20 acres in size at the Arlington Power Plant, located south of the PVNGS along Elliot Road in Section 17, Township 1 South, Range 6 West. The proposed Harquahala Junction Switchyard would be located in Section 25, Township 2 North, Range 8 West near 451<sup>st</sup> Avenue and the Thomas Road alignment adjacent to the location where the Palo Verde-Devers No. 1 and Harquahala-Hassayampa transmission lines intersect. The proposed switchyard would be a new 500kV facility on a site up to 40-acres in size.

The switchyards will consist of several steel structures for line terminations and station bus conductor support. The structures

and equipment will have a dulled finish similar to the transmission line towers as described in Section 4.2.1.2. The tallest switchyard structure will be up to 130 feet high. In addition to the electrical facilities, the switchyard will include control, protection, and communications equipment. The switchyard area will be graded for water retention and will be covered in gravel. The colors for the facilities will be selected to blend in with the existing setting to the extent possible. A fence is proposed for the switchyard sites, with appropriate landscaping per jurisdictional code.

Exhibit G contains a conceptual illustration of the switchyard layout proposed for the project.

#### 4.2.1.4 Purpose for constructing said transmission line:

The proposed project is needed to support the increased development and growth occurring and anticipated in the western Phoenix metropolitan area. This project also will strengthen the entire APS Phoenix metropolitan area transmission system comprised of APS, SRP, and WAPA transmission facilities by providing an additional electrical transmission source to the valley. Additionally, the proposed line will increase import transmission capability into the Phoenix metropolitan area as well as increase export transmission capability from the PV Hub. This project also allows the CAWCD to access the PV Hub to obtain energy to service its pumping loads.

### 4.2.2 General Location

#### 4.2.2.1 Description of the geographic points between which the transmission line will run:

The proposed transmission line will originate at either the PVNGS Switchyard located in Section 34 of Township 1 North, Range 6 West, Gila and Salt River Baseline and Meridian (G&SRB&M), or a new switchyard at the Arlington Power Plant located in Section 17 of Township 1 South, Range 6 West, G&SRB&M, each located south of I-10 near Wintersburg Road in an unincorporated area of Maricopa County, Arizona.

The transmission line will terminate at the TS-5 Substation near the Hassayampa Pumping Plant along the CAP Canal in the

Town of Buckeye, Maricopa County, Arizona, at Section 29, Township 4 North, Range 4 West, G&SRB&M.

4.2.2.2 Straight line distance between such geographic points:

The straight-line distance from the PVNGS Switchyard and the TS-5 Substation is 21.9 miles. The straight-line distance from the Arlington Switchyard and the TS-5 Substation is 24.8 miles.

4.2.2.3 Length of the transmission line for each alternate route:

The length of the Proposed Route is 43.1 miles (PVNGS Switchyard termination) or 42.1 miles (Arlington Switchyard termination).

The length of the Proposed Alternate Route is 43.4 miles (PVNGS Switchyard termination) or 42.4 miles (Arlington Switchyard termination).

4.2.3 Detailed Dimensions:

4.2.3.1 Nominal width of right-of-way requested:

The Applicant is requesting approval of total right-of-way width of up to 200 feet within a general corridor that is between 1,000 and 3,000 feet wide. A description of the requested corridor width according to specific segments (links) is provided in Section 4.2.5 of this application. The location of the alignment for the right-of-way within this corridor will be determined according to right-of-way considerations, site-specific design, and environmental requirements.

4.2.3.2 Nominal length of span:

The nominal length of span varies from 800 to 1,400 feet.

4.2.3.3 Typical height of structures above ground:  
Maximum height of supporting structures:

The maximum height of the supporting structures will be approximately 195 feet. The typical height of the supporting structures will vary from 130 to 150 feet.

4.2.3.4 Minimum height of conductor above ground:

The minimum height of the 500kV transmission line conductor above existing grade will be 31 feet 6 inches.

4.2.4 Estimated costs of proposed transmission line and substation:

	Total Length of Transmission Line (distance in miles)	Right-of-way Costs (\$ million)	Construction Costs <sup>1</sup> (\$ million)	Total of Right-of-Way and Construction Costs (\$ million)
<b>Construction Option #1</b>				
Continuous transmission line from Palo Verde Hub to TS-5 Substation <sup>2</sup>				
Proposed Route (PVNGS Switchyard Interconnection)	43.1	\$12.9	\$68.0	\$80.9
Proposed Route (Arlington Switchyard Interconnection)	42.1	\$12.5	\$66.5	\$79.0

<sup>1</sup>The Proposed Alternate Route adds \$500,000 in construction costs.

<sup>2</sup>Construction Option #2 includes \$7.1 million in additional costs (\$1.2 million for right-of-way costs and \$5.9 million for construction costs) for the Harquahala Junction Switchyard.

4.2.5 Description of the proposed and alternate routes:

The Applicant has identified a Proposed Route and a Proposed Alternate Route as part of the PV Hub to TS-5 Project to provide the APPTLSC with an additional option for the location of the proposed transmission line. Both the Proposed Route and Proposed Alternate Route are inclusive of two options for the origin of the proposed transmission line at either the PVNGS Switchyard (Link 10) or a new switchyard at the Arlington Power Plant (Link 20). The actual location for the interconnection with the PV Hub will be determined based on the Applicant's evaluation of system reliability and interconnection issues.

The Applicant is requesting a corridor between 1,000 and 3,000 feet in total width for the Proposed Route and Proposed Alternate Route described below to provide for limited but necessary flexibility during final design and engineering of the project. The typical right-of-way widths are described in Section 4.2.3.1 of this application.

The Proposed Route or Proposed Alternate Route may be built in two phases depending on the system option selected. The first option is to build the transmission line in its entirety with a projected in-service date of 2007. The second system option could be constructed in two phases with the second phase in-service in 2009 or later. The two options are detailed below.

The first construction option for the Proposed Route or Proposed Alternate Route would be to construct the project continuously from the PV Hub to the TS-5 Substation. The in-service date for this option is projected for 2007. The Harquahala Junction Switchyard would not be built as part of this system option.

The second construction option for the Proposed Route or Proposed Alternate Route would be to build the proposed Harquahala Junction Switchyard and construct the project in two phases. The first phase of this option would originate at the Harquahala Junction Switchyard and would terminate at the TS-5 Substation, a distance of approximately 29 miles with a projected in-service date of 2007. The existing Harquahala-Hassayampa 500kV transmission line would be cut-in at the proposed Harquahala Junction Switchyard. The existing Harquahala-Hassayampa 500kV transmission line between the Harquahala Junction Switchyard and the PV Hub would become part of the project until the second phase of the project is needed. The second phase of this option would consist of a 500kV transmission line from the Harquahala Junction Switchyard back to the PV Hub and would be constructed when needed (expected in 2009 or beyond).

The Proposed Route and Proposed Alternate Route are illustrated in Exhibits A-1 through A-4. Both routes include link numbers associated with segments that comprise each route as follows:

**Proposed Route (Links 10 or 20, 30, 50, 60, 80, 90, 100, 110, 120, and 130)**

The Proposed Route originates at either the PVNGS Switchyard located in Section 34, Township 1 North, Range 6 West or at a new switchyard at the Arlington Power Plant located in Section 17, Township 1 South, Range 6 West. If the route originates at the PVNGS Switchyard, the Applicant requests a 1,000-foot corridor on the north side of the existing Palo Verde-Devers No. 1 500kV transmission line right-of-way for this portion of the route (Link 10). If the route originates at a new switchyard at the Arlington Power Plant, the Applicant requests a 2,500-foot corridor west of the existing Harquahala-Hassayampa 500kV transmission line right-of-way (Link 20). Both interconnection options proceed to a common point

approximately ½ mile west of Wintersburg Road. From this location, the route proceeds west and then northwest, paralleling the existing Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV transmission lines to the proposed Harquahala Junction Switchyard located in Section 25, Township 2 North, Range 8 West (Link 30). For this portion of the route, the Applicant requests a 1,000-foot corridor on the north and east side of the existing Palo Verde–Devers No. 1 500kV transmission line right-of-way. Link 10 or 20 and Link 30 of the Proposed Route would be built in a later phase if the Harquahala Junction Switchyard is built as part of the initial project construction. If the Harquahala Junction Switchyard is not built as part of the initial project construction, Link 10 or 20 and Link 30 would be constructed as part of the initial construction.

From the Harquahala Junction Switchyard, the route proceeds generally north across I-10 and the CAP Canal parallel to the Palo Verde–Devers No. 1 500kV transmission line (Link 50). The Applicant requests a 1,000-foot corridor on the east side of the existing transmission line right-of-way for this portion of the Proposed Route. At this point, the route would turn easterly and would be located on the north side of the CAP Canal (Links 60, 80, 90, and 100) near the foothills of the Belmont Mountains to a point approximately ½ mile west of Wickenburg Road. The Applicant requests a 2,000-foot corridor on the north side of the chain-link fence located on the north side of the CAP Canal for this portion of the Proposed Route. At this point, the Proposed Route would turn easterly and would cross Wickenburg Road approximately ½ mile north of the CAP Canal to a point approximately 1 mile east of Wickenburg Road (Link 110). A 3,000-foot corridor on the north side of the chain-link fence located on the north side of the CAP Canal is requested for this portion of the Proposed Route. From this point, the route would turn northeast and would cross two existing 230kV and one existing 345kV transmission lines as well as the Hassayampa River before paralleling the north and west sides of the CAP Canal until it crosses the CAP Canal into the TS-5 Substation located in Section 29, Township 4 North, Range 4 West (Links 120 and 130). The Applicant requests a 2,000-foot corridor on the north side of the chain-link fence located on the north side of the CAP Canal for this portion of the Proposed Route and a corridor on the south side of the CAP Canal adjacent to the TS-5 Substation sufficient to interconnect with the TS-5 Substation.

**Proposed Alternate Route (Links 10 or 20, 30, 50, 70, 80, 90, 100, 110, 120, and 130)**

The Proposed Alternate Route shares the same alignment as the Proposed Route previously described, with the exception of an approximately 9-mile segment immediately east of the Palo Verde–Devers No. 1 500kV

transmission line and north of the CAP Canal (Link 70). In this area, the Proposed Alternate Route would be located approximately ½ mile north of the CAP Canal. The Applicant requests a 2,000-foot corridor extending south from the northern edge of the BLM-designated utility corridor (located approximately ½ mile north of the chain-link fence located on the north side of the CAP Canal). All other segments of the Proposed Alternate Route would be similar to the Proposed Route.

#### 4.2.6 Land Ownership:

The proposed routes traverse approximately 26 miles of BLM land, 7 miles of Arizona State Trust land, and 10 miles of private land for an overall length of approximately 43 miles. Of the approximately 10 miles of private land along the Proposed Route, 6.5 miles could be located on land owned in fee by the Bureau of Reclamation depending upon the final engineered alignment.

### 5. Jurisdictions:

#### 5.1 Areas of jurisdiction (as defined in A.R.S. Section 40-360) affected by this route:

Approximately 6 miles of the proposed routes are located within the Town of Buckeye. The remaining 37 miles are located within unincorporated Maricopa County.

#### 5.2 Designation of proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of affected areas of jurisdiction:

The proposed routes are not contrary to zoning ordinances or master plans of any affected areas of jurisdiction.

### 6. Description of the environmental studies Applicant has performed:

The environmental consulting firm of EPG coordinated the preparation of the environmental studies to support the application. Under direction of the Phoenix Field Office of the BLM, EPG (third-party contractors) conducted environmental studies that were utilized in preparation of the EA (Exhibit B-1) pursuant to the National Environmental Policy Act. The Proposed Route and Proposed Alternate Route are primarily located on lands managed by the BLM and Arizona State Land Department (ASLD). On BLM lands, all of the proposed routes would be located in BLM-designated utility corridors. Approximately 26 miles or 60 percent of the Proposed Route would be located within BLM-designated utility corridors. The BLM-designated utility corridors (1

mile wide) include the Palo Verde–Devers Utility Corridor, identified in the *Lower Gila South Resource Management Plan*, and the CAP Utility Corridor identified in the *Lower Gila North Management Framework Plan*. These corridors are identified in the BLM Resource Management Plans and are incorporated to consolidate like facilities across BLM lands.

Public and agency scoping, environmental resources inventory, and impact assessments were conducted for the Proposed Route and Proposed Alternate Route. Impacts to land use, visual resources, cultural resources, biological resources, socioeconomics, geology, soils, noise, and air were evaluated. An inventory of the existing environment, as well as an assessment of potential environmental consequences as a result of this project, was completed (see Exhibit B-1, Chapter 3).

In early 2003, APS began working closely with the Phoenix Field Office of the BLM to identify potential future utility corridors and substation sites in the western Phoenix metropolitan area for inclusion in the update to the BLM Bradshaw–Harquahala Resource Management Plan and the Phoenix South and Sonoran Desert National Monument Plan. This regional analysis considered potential alternative transmission line corridors and substation sites within a regional area including the entire study area defined for the PV Hub to TS-5 Project. The analysis considered land ownership, land management designations, and existing transmission lines and utility corridors. The results of the regional analysis were submitted to the BLM and also included a ranking, by priority, of the utility corridors in the regional study area. The corridor within which the Proposed Route and Proposed Alternate Route for the PV Hub to TS-5 Project are located was identified as the preferred utility corridor in the regional analysis.

After meeting with the BLM and further evaluation of the project description it was determined that the scope of the project would include a 500kV transmission line from the PV Hub to the TS-5 Substation. A further analysis of preliminary alternatives was conducted to ensure that the preferred utility corridor, identified in the utility corridor study, was the most environmentally compatible alternative for the PV Hub to TS-5 project. Approximately 200 miles of preliminary transmission line alternatives were evaluated. Table 1 of this application provides a comparison of the preliminary transmission line alternatives initially considered. Figure 1 at the end of this section illustrates the preliminary alternatives and composite environmental sensitivity.

The majority of the preliminary alternatives paralleled major travel routes, pipelines, canals, and transmission lines. The alternatives were evaluated for environmental, reliability, engineering, and system operating considerations. The Western Alternative Route was eliminated primarily because of potential land use and visual impacts in residential areas and the cost of the alternative due to its length (20 miles longer than the Proposed Route). The Central Alternative Route was eliminated because of potential land use and visual impacts in residential areas, particularly to the community of Tonopah. The Eastern Alternative Route was eliminated due to potential land use resource impacts

**TABLE 1  
POTENTIAL ISSUES COMPARISON OF  
PRELIMINARY ROUTE ALTERNATIVES**

Route	Proposed Route	Western Alternative Route	Central Alternative Route	Eastern Alternative Route
Length*	40.3 miles	63.5 miles	32.4 miles	27.4 miles
Land Ownership	BLM 25.2	BLM 33.4	BLM 7.0	BLM 1.3
	ASLD 6.6	ASLD 6.1	ASLD 2.4	ASLD 4.3
	Private /BOR 8.5	Private/BOR 24.0	Private /BOR 23.0	Private /BOR 21.8
Miles of Existing Transmission Line Paralleled	18.6	15.9	1.2	24.2
Miles of Canal Paralleled	22.9	40.9	19.6	4.5
Miles of Railroad Paralleled	0	3.2	0	0
Miles of Pipeline Paralleled	0	20.4	0	0
Miles within BLM-designated utility corridor	26.2	32.6	6.8	0
Miles of Environmental Sensitivity Crossed	High	10.9	14.3	6.4
	Moderate	46.9	17.6	18.2
	Low	5.7	0.6	2.8
		1.9		
Potential Land Use Resource Issues	Located primarily within federally designated utility corridors	Located primarily within federally designated utility corridors	Limited areas located within federally designated utility corridors	No areas located within federally designated utility corridors
	Future master planned communities along CAP near TS-5 siting area	Potential residential takes Crossing of agriculture areas near Harquahala Valley Rd. Future master planned communities along CAP near TS-5 siting area Adjacent to Big Horn Mountains Wilderness Area	Potential residential takes Crossing of agriculture areas near 395 <sup>th</sup> Avenue and Camelback Rd. Future master planned communities along CAP near TS-5 siting area	Potential residential takes Future master planned communities along Sun Valley Parkway within the Town of Buckeye
Potential Visual Resource Issues	Residential viewers south of the CAP	Residential viewers along Harquahala Valley Rd. and south of the CAP	Residential viewers along Wintersburg Rd. and in the community of Tonopah	Residential viewers along the Westwing corridor
	VRM Class II areas near Saddle Mountain, Burnt Mountain, and Belmont Mountains (within BLM-designated utility corridors)	Portions of ROW could be located adjacent to the Big Horn Mountains Wilderness (VRM Class I) VRM Class II areas near Burnt Mountain and Belmont Mountains (within BLM-designated utility corridors)	VRM Class II areas near Belmont Mountains (within BLM-designated utility corridor)	Impacts to viewers from Sun Valley Parkway (Town of Buckeye-designated scenic roadway corridor)

**TABLE 1  
POTENTIAL ISSUES COMPARISON OF  
PRELIMINARY ROUTE ALTERNATIVES**

<b>Route</b>	<b>Proposed Route</b>	<b>Western Alternative Route</b>	<b>Central Alternative Route</b>	<b>Eastern Alternative Route</b>
<b>Potential Biological Resource Issues</b>	Moderate sensitivity areas of bighorn sheep and desert tortoise habitat  Avoidance / relocation of protected Arizona native plant species	Moderate sensitivity areas of bighorn sheep and desert tortoise habitat  Avoidance/ relocation of protected Arizona native plant species	Moderate sensitivity areas of bighorn sheep and desert tortoise habitat  Avoidance / relocation of protected Arizona native plant species	Primarily low sensitivity areas associated with vegetation and wildlife resources  Avoidance / relocation of protected Arizona native plant species
<b>Potential Cultural Resource Issues</b>	Could cross a portion of the Jagow Well / Palo Verde Hills Archaeological District	No resource issues identified at this time	Could cross a portion of the Jagow Well / Palo Verde Hills Archaeological District	No resource issues identified at this time
<b>Potential Engineering and System Planning Issues</b>	No issues identified at this time	No issues identified at this time	Does not provide an option for the Harquahala Junction Switchyard	Reliability of electrical transmission system could be compromised by locating a fourth transmission line supplying the Phoenix metro area in the Westwing corridor  Does not provide an option for the Harquahala Junction Switchyard
<b>Reasons for Elimination of Alternative</b>	Route carried forward by the BLM for the Environmental Assessment	Potential land use and visual impacts in residential areas  Route is 20 miles longer than the Proposed Route, resulting in greater cost	Potential land use and visual impacts in residential areas	Potential for increased electrical outages in the Phoenix metropolitan area from an outage of multiple transmission lines in the same utility corridor  Potential land use impacts in residential areas

\*Distances are calculated at common points from the outer edge of the Palo Verde Hub Siting Area to the outer edge of the Preliminary TS-5 Siting Area as indicated on Figure 1.

in residential areas, as well as the potential for increased electrical outages in the Phoenix metropolitan area from an outage of multiple transmission lines in the same utility corridor. The Proposed Route and Proposed Alternate Route had the least amount of environmental impact compared to the other alternatives while still meeting engineering system requirements and cost considerations. Both of the proposed routes were evaluated in the EA (see Exhibit B-1). Chapter 2 of the EA provides a more detailed discussion of alternatives that were considered and eliminated.

Resources located within the project study area were inventoried by collecting existing data; reviewing existing literature, aerial photographs, and maps; and contacting appropriate federal, state, county, and municipal agencies. Field reconnaissance also was conducted. A study corridor 2 miles on each side of the reference centerline (Proposed Route and Proposed Alternate Route) was studied for potential visual resource and land use impacts. Detailed cultural surveys were conducted along the reference centerline for both the Proposed Route and Proposed Alternate Route. A report documenting these findings was sent to the BLM, BOR, and ASLD in November 2004 for review. Comments were received from the BLM and BOR and a revised draft was submitted to the BLM, BOR, and ASLD in January 2005. Consultation with the State Historic Preservation Office was initiated in April 2005 and is anticipated to be complete in May 2005.

Potential environmental impacts were determined through an impact assessment process that compared the proposed project and the existing environment. Potential impacts were identified and, where effective, mitigation measures were utilized to reduce or eliminate impacts. Standard construction operating procedures and mitigation measures included structure placement to avoid sensitive resources, matching existing structure type, use of nonspecular conductors and dulled grey structures, use of existing access for over 90 percent of the Proposed Route's overall length, landscape reclamation and revegetation, and biological and cultural monitoring. The mitigation measures are described in detail in the BLM EA (Exhibit B-1, Appendix A). In addition, a draft Plan of Development was prepared and approved by the BLM. The Plan of Development will be finalized and incorporated into the Construction, Operation, and Maintenance Plan documenting construction practices and stipulations that will be prepared in accordance with BLM requirements prior to construction.

The public involvement program was developed to identify potential issues and concerns of affected or interested agencies, Native American Tribes, and the public. The program included a public open house meeting, mailings, and direct contacts. A project newsletter was mailed to the public that described the proposed project and the time and location of the public open house meeting. The mailing list included over 7,600 addresses and was developed utilizing a mailing list provided by the BLM and a general mailing list that incorporated landowners within the study area. In addition to the newsletter, APS briefed local news sources and placed paid advertisements for the March open house meeting. In particular, APS briefed the *West Valley View Newspaper* and *Arizona Republic*. The *West Valley View Newspaper* ran a story on the project describing the purpose and need for the

project and the upcoming federal and state planning processes. A project website and information line also were established to provide additional information to the public. A total of 76 comments were received from the public at the open house meeting and throughout the planning process. Information from the public comments was incorporated into the evaluation of preliminary alternatives and selection of the Proposed Route and Proposed Alternate Route. Additionally, the BLM distributed two informational letters to over 300 individuals on their mailing list in March 2004 and September 2004 describing the proposed project and the project study area. The letter invited recipients to provide any comments to the BLM within a 30-day period. See Exhibit J for a summary of public comments and public involvement materials.

Exhibits A, B, C, D, and E of this application contain descriptions and conclusions of the environmental studies. Detailed descriptions of environmental studies for the proposed project are included in the BLM EA (Exhibit B-1).

7. Rationale for Route Preference:

The Proposed Route and Proposed Alternate Route described in this application have been found by APS and its environmental consultants (EPG) to be within the range of impacts deemed "environmentally compatible" in past Arizona siting decisions. The Proposed Route was preferred to the Proposed Alternate Route primarily because the Proposed Route would take advantage of existing two-track access roads on the north side of the CAP Canal between the Devers-Palo Verde #1 Line and the foothills of the Belmont Mountains (Link 60). The use of existing access would minimize impacts to biological resources and dispersed recreation use north of the CAP Canal, and provide direct access to CAP Canal controlled access if required for construction and maintenance.

The Proposed Alternate Route has the same basic alignment as the Proposed Route with the exception of Link 70, which is located north of Link 60 and ½ mile north of the CAP Canal. This proposed alignment was included in the analysis in response to comments from dispersed residents south of the CAP Canal. The residents requested that an alternative alignment for the proposed project be evaluated that would be located as far north in the existing BLM-designated utility corridor associated with the CAP Canal as possible to minimize views of the proposed project. The utility corridor in this area is 1 mile wide, ½ mile on either side of the CAP Canal. Through an analysis of potential impacts to residential viewers south of the CAP Canal, it was determined that there would be impacts to the residential viewers from either of the proposed routes. However, the majority of the residences would be located over ½ mile from the Proposed Route (Link 60) and over 1 mile from the Proposed Alternate Route (Link 70). Views of the proposed project from the residences would have partial screening from the CAP Canal and be intermittently backdropped by the Big Horn and Belmont mountains, reducing the visibility of the proposed transmission line.

The results of the visual resource analysis were presented to the BLM and it was determined that both of the alignments north of the CAP Canal (Links 60 and 70) would be acceptable based on the impacts described in the EA (see Exhibit B-1, Chapter 3). The potential impacts to residences south of the CAP Canal from the Proposed Route (Link 60) did not outweigh the benefits of using the existing access adjacent to the CAP Canal and consolidating facilities. Additionally, development of the Proposed Alternate Route (Link 70) would introduce a new access road approximately ½ mile north of the CAP Canal, which could potentially be used by off-highway vehicles and other recreational users resulting in potential indirect impacts to environmental resources in the area. The Proposed Route was therefore selected as the preferred route.

It is anticipated that the BLM will approve the Proposed Route and Proposed Alternate Route documented in the application. Furthermore, the CAWCD/BOR support both the Proposed Route and Proposed Alternate Route, which are located adjacent to CAP facilities. Additional rationale for the selection of the Proposed Route and Proposed Alternate Route follows.

The proposed routes are preferred by APS based on the following environmental considerations:

- No long-term or adverse effects to special status species or unique habitats will result with the construction of the proposed routes.
- The proposed routes would not constitute a barrier to wildlife movement after construction. Additionally, wildlife habitat fragmentation is not anticipated.
- Visual impacts are anticipated to be low to moderate for residential, recreation, and travel route viewers based on the following:
  - The proposed routes would parallel existing transmission lines and or the CAP Canal for its entire length.
  - The proposed routes would be located within BLM-designated utility corridors, and are consistent with the management objectives identified in the BLM planning documents.
  - The Proposed Route would use existing access for over 90 percent of its overall length.
  - Similar structure types will be used and sited adjacent to the existing transmission line structures (where practical).
  - The use of non-specular conductors and dulled grey structures.
- Historic and cultural properties will be avoided along the proposed routes. Eight Native American tribes were consulted and no significant issues or concerns were identified.
- No conflicts with any planned recreational uses are anticipated.

- Land use impacts were avoided by utilizing existing linear corridors. The nearest residence is approximately 1,000 feet away from the Proposed Route and Proposed Alternate Route and is located adjacent to two existing 500kV transmission lines. Single-pole structures were utilized for portions of the proposed routes east of Wickenburg Road along the CAP Canal to minimize potential land use impacts and the amount of acres disturbed.

Either the Proposed Route or Proposed Alternate Route presented in this application will meet the requirements for the PV Hub to TS-5 Transmission Project.

ARIZONA PUBLIC SERVICE COMPANY

By:   
Paul Herndon  
Project Manager

I HEREBY CERTIFY that on this 2 day of MAY, 2005, I have delivered to the Arizona Corporation Commission, twenty-five (25) copies of this Application for a Certificate of Environmental Compatibility.

# OVERSIZED MAP

## PALO VERDE HUB TO TS-5 500kv TRANSMISSION PROJECT

Alternatives Considered and  
Composite Environmental  
Sensitivity

FIGURE 1

# EXHIBIT A

**EXHIBIT A**  
**LOCATION AND LAND USE MAPS**

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**EXHIBIT A**  
**LOCATION AND LAND USE MAPS**

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“Where commercially available, a topographic map, 1:250,000 scale, showing any proposed transmission line route of more than 50 miles in length and the adjacent area. For routes less than 50 miles in length, use a scale of 1:62,500. If application is made for alternative transmission line routes, all routes may be shown on the same map, if practicable, designated by the applicant’s order of preference.”*

- Exhibit A-1:           Jurisdiction
- Exhibit A-2:           Land Ownership
- Exhibit A-3:           Existing Land Use
- Exhibit A-4:           Planned Land Use

# OVERSIZED MAP

PALO VERDE HUB  
TO TS-5 500kv  
TRANSMISSION PROJECT

Jurisdiction

Exhibit A-1

# OVERSIZED MAP

PALO VERDE HUB  
TO TS-5 500kv  
TRANSMISSION PROJECT

Land Ownership

Exhibit A-2

# OVERSIZED MAP

PALO VERDE HUB  
TO TS-5 500kv  
TRANSMISSION PROJECT

Existing Land Use

Exhibit A-3

# OVERSIZED MAP

PALO VERDE HUB  
TO TS-5 500kv  
TRANSMISSION PROJECT

Planned Land Use

Exhibit A-4

# EXHIBIT B

**EXHIBIT B**  
**ENVIRONMENTAL REPORT**

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## **EXHIBIT B**

### **ENVIRONMENTAL REPORT**

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R-14-3-219:

*“Attach any environmental studies which applicant has made or obtained in connection with the proposed site(s) or route(s). If an environmental report has been prepared for any federal agency or if a federal agency has prepared an environmental statement pursuant to Section 102 of the National Environmental Policy Act, a copy shall be included as part of this exhibit.”*

Under the direction of the BLM, the environmental consulting firm of EPG, Inc., third party contractor, conducted environmental studies that were utilized in the preparation of the EA (included under separate cover as Exhibit B-1). Refer to the EA for a more detailed discussion of all of the resources evaluated during the planning process.

#### **LAND USE**

##### **Overview**

The study area for the land use resources inventory was defined as a 4-mile-wide corridor (2 miles on each side of the reference centerline). Data were collected and updated between January 2004 and April 2005. The land use inventory considered existing and planned land uses within the project study area and was compiled through the review and interpretation of secondary data such as existing maps and planning documents, field reconnaissance, and contacts with key federal, State Trust, and local land-management and agency officials.

A description of conditions along the Proposed Route is described initially in this section, followed by a description of potential impacts to land use resources from both the Proposed Route and Proposed Alternate Route.

##### **Jurisdictions and Land Ownership**

The jurisdictions within the study area are shown in Exhibit A-1. Land ownership is shown in Exhibit A-2. Table B-1 includes the land ownership categories that the proposed transmission line would cross in approximate miles.

<b>Ownership</b>	<b>Proposed Route (miles)</b>		<b>Proposed Alternate Route (miles)</b>	
	<b>PVNGS Switchyard</b>	<b>Arlington Switchyard</b>	<b>PVNGS Switchyard</b>	<b>Arlington Switchyard</b>
	BLM	25.8	25.7	26.1
State Trust	7.1	6.8	7.1	6.8
Private/BOR	10.2	9.6	10.2	9.6
<b>Route Total</b>	<b>43.1</b>	<b>42.1</b>	<b>43.4</b>	<b>42.4</b>

<sup>1</sup>Actual distances may vary based on the final survey of the route alignment.

The Proposed Route primarily crosses BLM land managed by the Phoenix Field Office. Portions of the BLM-managed lands north of the CAP Canal along Links 60, 80, 90, 100, 110, and 120 were withdrawn and are managed by the Bureau of Reclamation (BOR); however, the BLM remains the land-management agency responsible for the portion of this land north of the northernmost CAP Canal fence line along which Link 60 of the Proposed Route would be located. The BOR owns land in fee along portions of Links 120 and 130. Unincorporated private land within Maricopa County includes the communities of Tonopah and Wintersburg. Incorporated private land is located within the Town of Buckeye.

### Existing Land Use

Existing land uses include designated BLM land (including utility corridors and dispersed recreational areas); utility and other infrastructure (the PVNGS, Arlington Power Plant, high-voltage transmission lines, and a natural gas pipeline); mining; residential; grazing and livestock facilities; and transportation routes. Through the use of BLM-designated utility corridors, the proposed project crosses a minimal amount of developed land. A map illustrating existing land uses is provided in Exhibit A-3.

### Planned Land Use

The portion of the Proposed Route that crosses BLM land is located within the Phoenix South Planning Area (south of I-10) and the Bradshaw Foothills Planning Area (north of I-10). The BLM is currently in the process of updating the Phoenix South RMP and the Bradshaw Foothills–Harquahala RMP. The RMP provides a comprehensive framework for future management actions, uses, allocation of public land, and resources. The Phoenix South RMP is currently in the alternatives development phase and the Bradshaw Foothills–Harquahala RMP is in the impact analysis phase. Until these RMPs are completed, the *Lower Gila North Management Framework Plan* (BLM 1994) and the *Lower Gila South Resource Management Plan* (BLM 1988) remain the primary BLM planning guide for the portions of the study area north and south of I-10, respectively.

The Proposed Route would be located within BLM-designated utility corridors and is consistent with the management objectives identified in the BLM planning documents. The current RMP identifies the Palo Verde–Devers Utility Corridor as one of 10 “existing utility rights-of-way that should be designated to serve as utility corridors, and recommends that each of these corridors be 1-mile-wide” (BLM RMP 1988). This corridor is referred to as No. 2 in the RMP. The CAP Utility Corridor is a 1-mile corridor identified in decision LGN-MFP-3-L-2.1 of the Lower Gila North Management Plan (MFP 1994).

The future use of unincorporated private and State Trust land is planned under the jurisdiction of Maricopa County. The Maricopa County Tonopah/Arlington Area Plan (Maricopa County 2000) provides for rural residential and industrial uses on the land within the southern portion of the project study area. In the northern portion of the study area, the Maricopa County 2020 Comprehensive Plan (Maricopa County 2002) provides for rural residential land use. Within the unincorporated private land, Maricopa County has numerous approved platted subdivisions, which are developing at varying rates. These platted subdivisions are shown on Exhibit A-4.

The general land use designation within the Town of Buckeye Planning Area is “Planned Community.” This designation is intended to “accommodate all land uses approved as part of a community master plan, where specific uses, public services, densities, and design criteria have been identified and adopted” (Town of Buckeye 2001). Several master planned communities in the study area are located within the Buckeye town limits. Pulte/Del Webb owns property south of the CAP Canal, including Sun City Festival, which is located south of the CAP Canal and east of the TS-5 Substation. Sun City Festival has an approved community master plan and is in the process of having plats approved. Festival Ranch development is an approved community master plan, which spans the CAP Canal. The Douglas Ranch development also has an approved community master plan. Douglas Ranch is located west of the Hassayampa River on the north and south sides of the CAP Canal. Town of Buckeye properties in the study area that do not have approved community master plans include Sun Valley and Trillium.

The Arizona State Land Department, Minerals Division has identified two pending mineral lease applications that are generally located in the northwestern portion of Section 36 of Township 4 North, Range 5 West. Depending upon the location of the final engineered alignment of the proposed transmission line, a portion of Link 120 could cross a small portion of the proposed mineral lease area.

A map illustrating planned land uses is provided in Exhibit A-4.

### **Recreation**

Dispersed recreational activities such as hunting, hiking, horseback riding, and off-highway vehicle uses occur on public land along the Proposed Route and in the general area. The Big Horn Mountains Wilderness Area is located on BLM land approximately 2 miles north and west of the Proposed Route.

In July 2004, the Maricopa County Board of Supervisors approved the Maricopa County Regional Trail System Plan, which identifies future trail corridors throughout the county. The plan identifies corridors according to segments with a corresponding priority level. Three corridors identified in the plan are located within the study area including two portions of the CAP Canal and the Old Camp Wash in the northern and southern portion of the study area. The portion of the proposed Maricopa County Regional Trail (MCRT) along the CAP Canal within the Town of Buckeye was identified as a Priority Three segment. Priority Three segments are identified as “regional corridors that are not key components of the regional trail system at this time, but may become important future trails” (Maricopa County 2004). The remaining portion of the corridor along the CAP Canal in unincorporated Maricopa County and the corridor along the Old Camp Wash were identified as Priority Four segments. These segments were identified as future trail corridors (5 miles wide) worthy of further study. According to Maricopa County Department of Transportation (MCDOT), there is 20 feet of space available from the BOR and CAWCD on the southern side of the CAP Canal for potential trail development. MCDOT indicated that future trail development would therefore likely occur on the southern side of the CAP Canal (Kempton 2004).

### **Recreation Opportunity Spectrum**

In the BLM planning process, Recreation Opportunity Spectrum (ROS) classifications are used to help set recreational themes within each of the BLM’s management areas. The majority of the BLM land crossed by the Proposed Route is located within the Roaded Natural category. The Roaded Natural designation is given to areas typically characterized by a natural environment with moderate evidence of humans. A portion of the proposed transmission line route also would cross BLM land designated as Semi-Primitive Motorized, associated with Saddle Mountain along Link 30, which is typically characterized by a predominantly unmodified natural environment of moderate to large size. Semi-Primitive Motorized areas crossed by the Proposed Route are located within the BLM-designated Palo Verde–Devers Utility Corridor where the Proposed Route would parallel two existing 500kV transmission lines.

### **Potential Impacts – Proposed Route**

Construction of the proposed facilities would not conflict with existing or planned land uses or recreation areas inventoried along the Proposed Route. The Proposed Route would be located within BLM-designated utility corridors and is consistent with the management objectives identified in the BLM planning documents. The Proposed Route would parallel the existing Palo Verde–Devers No. 1 500kV transmission line and the CAP Canal within BLM-designated utility corridors and utilize and/or improve existing access to the extent practical along the entire alignment.

### **Potential Impacts – Proposed Alternate Route**

Impacts associated with the Proposed Alternate Route are anticipated to be similar to those for the Proposed Route. Link 70 is approximately ½ mile north of the CAP Canal and located within a BLM-designated utility corridor. The development of new access for the construction, operation, and maintenance of Link 70 of the Proposed Alternate Route will result in greater surface disturbance and may increase the potential for use of these areas by off-highway vehicles and other dispersed recreation activities.

# EXHIBIT C

**EXHIBIT C**  
**AREAS OF BIOLOGICAL WEALTH**

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## EXHIBIT C

### AREAS OF BIOLOGICAL WEALTH

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“Describe any areas in the vicinity of the proposed site or route which are unique because of biological wealth or because they are habitats for rare and endangered species. Describe the biological wealth or species involved and state the effects, if any, the proposed facilities will have thereon.”*

Exhibit C includes summaries of areas of biological wealth, as well as the potential impacts the Proposed Route and Proposed Alternate Route may have on each resource. For further information refer to the EA, provided under separate cover as Exhibit B-1.

### BIOLOGICAL WEALTH

#### Introduction

Special status plant species and wildlife that potentially occur within the study area are listed in Table C-1. These include species listed as endangered, threatened, or candidate species under the Endangered Species Act, wildlife species of special concern identified by the Arizona Game and Fish Department (AGFD), or highly safeguarded plants by the Arizona Department of Agriculture. The information provided in Table C-1 includes the results of a literature search, secondary data from the BLM, review of previous studies conducted in the area of the proposed action, and field visits conducted during February, June, and August of 2004. Field visits did not include any species-specific surveys, but were performed for reconnaissance purposes only. Table C-1 was compiled utilizing the United States Fish and Wildlife Service (USFWS) endangered species Internet site (TESS), information provided by the AGFD specific for the Proposed Action (AGFD 2004a), and the AGFD Heritage Data Management System (HDMS) Internet site (AGFD 2004b).

**TABLE C-1  
SPECIAL STATUS SPECIES**

Common Name	Scientific Name	Habitat	Federal Status	State of Arizona
<b>MAMMALS</b>				
California leaf-nosed bat	<i>Macrotus californicus</i>	Sonoran desertscrub with caves or mines for roosts.	SC	WC
Cave myotis	<i>Myotis velifer</i>	Roosts primarily in mines or caves in xeric habitats such as creosote bush or paloverde mixed scrub plant associations. Requires a permanent water source within a few miles of roost.	SC	
Pale Townsend's big-eared bat	<i>Plecotus (Corynorhinus) townsendii pallescens</i>	Areas with caves, mines, or structures for night roosts, from desertscrub up into coniferous forest.	SC	
Feral burro	<i>Equus asinus</i>	Lower Colorado River Valley and Arizona Upland subdivisions of the Sonoran desertscrub in western Arizona.	USC	
<b>BIRDS</b>				
American peregrine falcon	<i>Falco peregrinus anatum</i>	Open areas with perches providing good visibility. Found in almost any habitat.	SC	WC
Western burrowing owl	<i>Athene cunicularia hypugia</i>	Open country, agricultural areas, urban habitats at golf courses, and airports.	SC	
<b>REPTILES</b>				
Desert tortoise (Sonoran population)	<i>Gopherus agassizii</i>	Completely terrestrial desert species requiring firm, but not hard, ground for construction of burrows, frequents desert oases, riverbanks, washes, and rocky slopes.	SC	WC
Common chuckwalla	<i>Sauromalus ater</i>	Rock-dwelling, herbivorous lizard, widely distributed in the desert.	SC	
<p>Key: Federal Status: SC = Species of concern            State Status: WC = Wildlife of special concern in Arizona. HS = Highly Safeguarded (Native Plant Law)            USC: United States Code - Title 16 - Conservation - Chapter 30 - Wild horses and Burros: Protection, Management, and Control            Sources: AGFD 2004a, 2004b; AOU 1998; Burt and Grossenheider 1980; Degenhardt et al. 1996; Ehrlich et al. 1988; Glinski 1998; Harvey et al.; 1999; Hoffmeister 1986; ITIS 2005; NGS 2002; Stebbins 2003; Wheeler 2003</p>				

## Vegetation

There are no known special status plant species or critical habitat for such plant species within the study area. The AGFD did not list any Highly Safeguarded (HS) plant species as occurring in the study area (AGFD 2004a). Prior to construction, a native plant inventory will be conducted on BLM and Arizona State Trust land crossed by the Proposed Route. The inventory will be conducted in accordance with the Arizona Department of Agriculture guidelines.

## Wildlife

There are no federally listed threatened, endangered, or candidate wildlife species that are known to occur in the study area that would be affected by the proposed transmission line. The study area is within the historic range of the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), a federally listed endangered species, but there is no suitable habitat for pygmy-owls in the study area.

There are eight sensitive species of animals that could potentially be present in the study area. Seven of these species are federal species of concern and one, the feral burro, is protected under the Wild Horses and Burros Act. Feral burros, probably individuals of the Harquahala herd, have been observed just south of the CAP Canal. The federal species of concern include three species of bats—the California leaf-nosed bat, cave myotis, and pale Townsend's big-eared bat. Other species of concern include two bird and two reptile species.

The presence of abandoned mineshafts and adits from historic mining activity in the vicinity of the Proposed Route could provide suitable roosting habitat for some of the species of bats mentioned above. There is moderate potential for the California leaf-nosed and the pale Townsend's big-eared bat to occur within the study area, but due to a lack of a permanent water source near such roosts, the cave myotis is thought to have a low probability of being present.

There are no suitable nesting sites in the study area for the American peregrine falcon and there is a low probability for their presence here as a foraging species. Suitable habitat for the western burrowing owl is present along much of the transmission line route, and the probability of their presence along the route is considered to be moderate.

For BLM land in Arizona, desert tortoise habitat is divided into three categories, ranging in importance from Category 1 to 3, based on criteria for maintaining and protecting desert tortoise habitat. There is no Category 1 habitat within the study area. Approximately 6 miles of Category 2 habitat is present in the area between Saddle Mountain and the Palo Verde Hills along Link 30. Approximately 6 miles of Category 2 habitat also is present along Links 60, 70, 80, 90, and 100. Approximately 2½ miles of the proposed transmission line right-of-way would pass through BLM Category 3 desert tortoise habitat in the foothills of the Belmont Mountains north of the CAP Canal along Links 60, 70, 100, and 110. The presence of suitable habitat does not indicate a known presence of desert tortoises in these areas, but only indicates that potential habitat is present (Hughes 2005).

The common chuckwalla may be present in rocky areas in the southern end of the Belmont Mountains or in rocky areas west of the Palo Verde Hills or northeast of Saddle Mountain. The probability for the presence of chuckwallas within the study area is considered to be moderate.

## **Potential Impacts – Proposed Route**

### **Vegetation**

No long-term, adverse effects to special status species or unique habitats will result from construction or operation of the Proposed Route. The transmission line will span xeroriparian and green-up habitats and no long-term loss of habitat will occur except at structure sites.

### **Wildlife**

No long-term, adverse effects to special status species will result from construction or operation of the Proposed Route. Bats should only be present within the project right-of-way during nocturnal foraging activity, and no direct impacts to these bat species should result from construction of the proposed transmission line. The potential for birds to collide with the transmission line is minimal because the dimensions between the components of the proposed 500kV transmission line are sufficient to preclude any potential for electrocution of any bird species. Similarly, birds are unlikely to collide with conductor wires because conductor bundle size makes them readily visible. In areas where burrowing owls are encountered within the right-of-way, passive relocation or exclusion would be recommended during non-breeding seasons. Exclusion would be accomplished by the placement of a one-way control device at burrow entrances and the subsequent collapsing of burrows after confirmation that the burrow has been vacated.

There is a potential for desert tortoise along sections of the Proposed Action, particularly in the Category 2 and 3 habitat areas identified along portions of Links 30, 60, 70, 80, 90, 100, and 110. After the final alignment of the transmission line is determined, pre-construction surveys would be performed to determine the presence and relative density of desert tortoises. Mitigation efforts would be applied to minimize loss of quality or quantity of desert tortoise habitat in accordance with current BLM policy (*Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona*, October 1990).

Monitoring for desert tortoises may be required along certain areas of the proposed transmission line when construction activity occurs during tortoise season (March through October). With a tortoise monitor present during construction activity in tortoise season, impacts to desert tortoises could be minimized. Links 90, 100, and 110 will require the development of new access resulting in the potential removal of a greater amount of vegetation associated with desert tortoise habitat compared to Links 60 and 80. Removal of vegetation, which may include plants utilized by desert tortoises for food or shade, during clearing of structure pads and access roads can in part

be mitigated through post-construction re-seeding of disturbed areas with an appropriate native seed mix.

If construction avoids placement of structure sites in and roadways through areas of large rocks, there should be no impacts to the common chuckwalla. Any effects to feral burros from construction of the proposed transmission line should be negligible.

### **Potential Impacts – Proposed Alternate Route**

Potential impacts associated with the Proposed Alternate Route are similar to those anticipated for the Proposed Route. Depending upon the final alignment, the Proposed Alternate Route may cross an additional 0.4 mile of Category 2 desert tortoise habitat than the Proposed Route. The Proposed Alternate Route will cross a similar amount of Category 3 desert tortoise habitat as the Proposed Route.

## REFERENCES

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# EXHIBIT D

**EXHIBIT D**  
**BIOLOGICAL RESOURCES**

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## EXHIBIT D – BIOLOGICAL RESOURCES

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“List the fish, wildlife, plant life and associated forms of life in the vicinity of the proposed site or route and describe the effects, if any, the proposed facilities will have thereon.”*

Exhibit D includes a summary of biological resources, as well as the potential impacts the Proposed Route and Proposed Alternate Route may have on biological resources. For further information refer to the EA, provided under separate cover as Exhibit B-1.

### BIOLOGICAL RESOURCES

#### Introduction

Biotic resource inventory studies were conducted for the Proposed Route and Proposed Alternate Route. Biological resources present in the study area that were inventoried include vegetation types and associated wildlife, unique habitats, and special status plant and wildlife species. Vegetation types were determined during site visits in 2004.

#### Inventory

##### **Vegetation Types**

Several vegetation types are present along the Proposed Route and there is a general overall increase in the density of vegetation cover from south to north. Much of the length of the Proposed Route passes through desertscrub where creosote bush (*Larrea tridentata*) is a prominent component. Areas of saltbush habitat are present along Links 20 and 30 within and just west of the PV Hub. Saltbush habitats are characterized by extreme aridity. They may exist either as a product of their topography, climate, and/or soil morphology (xerophytic type) or as a result of the chemical properties of their soil (halophytic type) (Turner 1982).

Once the Proposed Route crosses north of I-10 (Link 50), the plant community is generally creosote bush with scattered saguaro cacti (*Carnegiea gigantea*). This vegetation type is essentially continuous until the area just north of the CAP Canal east of Burnt Mountain where runoff from the Belmont Mountains provides additional moisture that supports greater plant species diversity (Links 80, 90, 100, and portions of Link 110).

In the foothills on the south side of the Belmont Mountains, there are communities of foothill paloverde (*Parkinsonia microphylla*), ironwood (*Olneya tesota*), and saguaro that are almost wholly restricted to drainages, including the smallest runnels, rather than being evenly distributed over the bajada. Between the drainageways, the landscape is dominated by a creosote

bush and bursage (*Ambrosia* spp.) community with localized concentrations of teddybear cholla (*O. bigelovii*), buckhorn chollas (*O. acanthocarpa*), and intermittent hedgehog cactus (*Echinocereus engelmannii*). Vegetation on the interfluvials is minimal in some areas where there is desert pavement, and often only rigid spiny herb (*Chorizanthe rigida*) and a few buckwheat (*Eriogonum* sp.) plants are found.

Blue paloverde communities present in several xeric drainages at the east end of the proposed transmission line are dominated by blue paloverde with burrobrush (*Hymenoclea salsola*) present as a co-dominant species in some areas (Link 120).

During the original construction of the CAP Canal, conduits for runoff waters were incorporated into the canal structure to allow waters draining off the southern slopes of the Big Horn and Belmont Mountains to bypass the canal. Other drainages for which bypasses were not constructed, however, periodically capture and hold runoff waters. The result is that green-up areas have developed at several points along the north side (upslope) of the CAP Canal. These areas support increased plant species diversity and density due to the additional impounded water that is seasonally present.

The green-up areas where runoff collects north of the CAP Canal provide cover, forage, and nesting habitat for many species of animals. Tree species present in the green-up areas in order of prevalence are blue paloverde, velvet mesquite (*Prosopis velutina*), catclaw acacia (*Acacia greggii*), and ironwood. The green-ups do not appear to support any invasive tamarisk (*Tamarisk* sp.) trees. The dominant shrub species in many of the green-ups is desert broom (*Baccharis sarothroides*).

## Wildlife

The mammalian fauna of the study area is dominated by species of small, nocturnal rodents and bats including several species of pocket mice and kangaroo rats. Big game species present include desert bighorn sheep (*Ovis canadensis mexicana*), mule deer (*Odocoileus hemionus*), and javelina (*Pecari tajacu*). Carnivores present likely include coyote (*Canis latrans*), gray fox (*Vulpes macrotis*), badger (*Taxidea taxus*), bobcat (*Lynx rufus*), and at least two species of skunks.

Because of a general lack of dense vegetation that provides cover and nesting habitat, there are fewer bird species present in the Lower Colorado Subdivision of the Sonoran desertscrub biome. Turner (1982) lists only LeConte's thrasher (*Toxostoma lecontei*) as representative of this subdivision. Birds observed or documented during field visits to the study area included the following:

- northern harrier (*Circus cyaneus*)
- red-tailed hawk (*Buteo jamaicensis*)
- American kestrel (*Falco sparverius*)

- Gambel's quail (*Callipepla gambelii*)
- great horned owl (*Bubo virginianus*)
- Gila woodpecker (*Melanerpes uropygialis*)
- Say's phoebe (*Sayornis saya*)
- Abert's towhee (*Pipilo aberti*)
- black-tailed gnatcatcher (*Polioptila melanura*)
- loggerhead shrike (*Lanius ludovicianus*)
- common raven (*Corvus corax*)
- verdin (*Auriparus flaviceps*)
- canyon wren (*Catherpes mexicanus*)
- cactus wren (*Campylorhynchus brunneicapillus*)
- black-throated sparrow (*Amphispiza bilineata*)
- house finch (*Carpodacus mexicanus*)
- phainopepla (*Phainopepla nitens*)

The only reptiles observed during site visits were the zebra-tailed lizard (*Callisaurus draconoides*) and common side-blotched lizard (*Uta stansburiana*). Amphibian species are likely to be very limited, but spadefoot toads are likely to be present and would be active during the summer rainy season. The Great Plains toad (*Bufo cognatus*) and spadefoot toads (*Spea* spp. and *Scaphiopus* spp.) may be present in the green-up areas, and Woodhouse's toad (*B. woodhousii*) could be present in any irrigation waters available in the area.

Because of the lack of naturally occurring permanent surface water sources within the study area, no fish species are present except for several species of non-native fish in the CAP Canal. Listings of species of mammals, birds, reptiles and amphibians that may occur in the study area are provided in Tables D-1, D-2, and D-3 respectively at the end of this section.

### **Potential Impacts – Proposed Route**

Potential impacts to biological resources associated with the Proposed Route are related to activities likely to occur during the construction, operation, and maintenance of the line. Overall impact levels were determined to be primarily low, with some areas of moderate impact based on the review of the resources present, anticipated level of disturbance to those resources, and effectiveness of applied mitigation. Biological resources included in the impact assessment were vegetation types, and special status plant and wildlife species.

### **Vegetation**

Impacts to native vegetation are anticipated to be low to moderate. All of the habitat types along the proposed transmission line route, defined primarily by vegetation, are associations within the Sonoran desertscrub biome. Impacts to these habitats would include removal of existing vegetation during the clearing and grading of new access roads, structure sites, crane pads, wire

splicing and pulling sites, and lay-down yards. Links 90, 100, and 110 will require the development of new access resulting in the potential removal of a greater amount of vegetation compared to Links 60 and 80. This would impact available forage, nesting sites, and protective cover provided by these plants. Other impacts could include increased human access to previously undisturbed areas, and an increase in areas susceptible to colonization by invasive plant species.

Because of increased availability of water, xeroriparian and green-up areas often support numerous desert plant species. Since most of the xeroriparian and green-up habitats are narrow, the line can span these areas and there would be minimal impact to these habitats. Because of the width of the Hassayampa River at the proposed transmission line crossing, a single structure will need to be placed in the river channel. The permanent impact of the foundation for this single structure will have a negligible effect on the blue paloverde habitat in the river bottom.

Impacts of the proposed transmission line also may include ground disturbance and increased human access during construction. Ground disturbance occurring during construction of the Proposed Route would result from upgrading or building access and structure spur roads, placement of structure footings, and from activities at wire-splicing and tensioning sites. Permanent loss of habitat would be restricted to the area required for structure foundations. There could be short-term loss of vegetation due to trampling and soil compaction in the immediate vicinity of construction areas. The recontouring and revegetation of construction yards after completion of construction will occur per standard construction and operating procedures and mitigation measures. The seed mix used to complete the revegetation will be approved by the BLM and the Arizona Department of Agriculture.

## **Wildlife**

Increased noise and activity levels during construction could result in short-term impacts to wildlife. Larger mammals and bird species would likely avoid the area during construction, particularly along washes used as movement corridors. Direct mortality could occur to other wildlife, such as reptiles and small mammals, due to increased vehicular traffic along access roads, and the inability of these smaller animals to avoid such contact. There could also be a loss of burrows and nests for ground-dwelling species. Big game species, including mule deer and javelina, probably utilize xeric washes as movement corridors throughout the study area. Bighorn sheep may occasionally be present in the vicinity of the line in the south end of the Belmont Mountains (Links 80, 90, and 100), and also could possibly cross the Proposed Route between Saddle Mountain and the Palo Verde Hills (Link 30) in years where suitable forage is available in the Palo Verde Hills. The Proposed Route will not constitute a barrier to wildlife movement after construction, and habitat fragmentation will not occur.

## Potential Impacts – Proposed Alternate Route

Potential impacts associated with the Proposed Alternate Route are similar to those anticipated for the Proposed Route. Construction of the Proposed Alternate Route would require the development of new access from the existing access road associated with the Palo Verde–Devers No. 1 transmission line on the east side of Burnt Mountain to Link 80, a distance of approximately 9 miles. This new access may require the permanent removal of approximately 22 acres of existing desertscrub vegetation to allow for routine transmission line maintenance and emergency service activities. A native plant inventory will be conducted prior to construction; however, no impacts to unique or threatened or endangered vegetative habitats are anticipated.

**TABLE D-1  
MAMMAL SPECIES THAT MAY OCCUR IN THE VICINITY OF THE PROPOSED PROJECT**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>
Desert shrew	<i>Notiosorex crawfordi</i>	Any area with ample ground cover including plant debris, trash, and lumber
California leaf-nosed bat	<i>Macrotus californicus</i>	Sonoran desertscrub with caves and mines
Cave myotis	<i>Myotis velifer</i>	Desertscrub with caves, mines, or bridges and water nearby
California myotis	<i>Myotis californicus</i>	Desertscrub with rock faces containing crevices, occasionally caves and mines
Western pipistrelle	<i>Pipistrellus hesperus</i>	Areas with canyon walls or cliff faces for roosting, streambeds, and tanks for foraging
Big brown bat	<i>Eptesicus fuscus</i>	Wooded areas, desertscrub
Townsend's big-eared bat	<i>Plecotus townsendii</i>	Areas with caves or mines, structures for night roosts
Pallid bat	<i>Antrozous pallidus</i>	Desertscrub with caves, mine, cliffs, bridges, or other structures for roosts
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>	Desertscrub and foothills with mines, caves, bridges or old buildings
Pocketed free-tailed bat	<i>Tadarida femorosacca</i>	Rocky cliffs and slopes, structures
Big free-tailed bat	<i>Tadarida macrotis</i>	Rocky cliffs with crevices
Desert cottontail	<i>Sylvilagus audubonii</i>	Desertscrub, semi-desert grassland
Black-tailed jack rabbit	<i>Lepus californicus</i>	Desertscrub and other areas with open ground cover
Harris' antelope squirrel	<i>Ammospermophilus harrisi</i>	Rocky areas of creosote bush/saltbush/bursage
Rock squirrel	<i>Spermophilus variegatus</i>	Rocky areas above 1,600 feet
Round-tailed ground squirrel	<i>Spermophilus tereticaudus</i>	Creosote bush/saltbush desert with sandy or gravelly soil
Botta's pocket gopher	<i>Thomomys bottae</i>	Any area with soil suitable for digging burrows
Little pocket mouse	<i>Perognathus longimembris</i>	Sandy or gravelly soils in broken or rolling country
Arizona pocket mouse	<i>Perognathus amplus</i>	Desertscrub
Rock pocket mouse	<i>Chaetodipus intermedius</i>	Rocky areas of desertscrub
Desert pocket mouse	<i>Chaetodipus penicillatus</i>	Sandy areas of desertscrub with sparse vegetation
Bailey's pocket mouse	<i>Chaetodipus baileyi</i>	Flats and lower slope areas of desertscrub

**TABLE D-1  
MAMMAL SPECIES THAT MAY OCCUR IN THE VICINITY OF THE PROPOSED PROJECT**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>
Merriam's kangaroo rat	<i>Dipodomys merriami</i>	Sandy areas of desertscrub
Desert kangaroo rat	<i>Dipodomys deserti</i>	Areas with deep sandy soil
Plains harvest mouse	<i>Reithrodontomys montanus</i>	Desertscrub or chaparral
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Desertscrub or chaparral
Cactus mouse	<i>Peromyscus eremicus</i>	Desertscrub, rocky areas, chaparral
Deer mouse	<i>Peromyscus maniculatus</i>	Coniferous or riparian woodland, desertscrub adjacent to canals or intermittent creeks
Southern grasshopper mouse	<i>Onychomys torridus</i>	Desertscrub or semi-desert grassland with compact soil
Arizona cotton rat	<i>Sigmodon arizonae</i>	Mesquite scrub and weedy areas along canals and washes
White-throated wood rat	<i>Neotoma albigula</i>	Areas below the conifer belt, especially with <i>Opuntia</i> or paloverde
Desert wood rat	<i>Neotoma lepida</i>	Desertscrub
House mouse	<i>Mus musculus</i>	Weedy areas and cultivated fields, usually near human habitation
Coyote	<i>Canis latrans</i>	Cosmopolitan, from spruce forest to low desert
Kit fox	<i>Vulpes macrotis</i>	Desertscrub and desert grassland with sandy or softer clay soils
Gray fox	<i>Urocyon cineroargenteus</i>	Open desertscrub, chaparral, lower elevation woodland
Ringtail	<i>Bassariscus astutus</i>	Steep rocky areas near water
Badger	<i>Taxidea taxus</i>	Flats and drainages adjacent to mountains, grasslands
Western spotted skunk	<i>Spilogale gracilis</i>	Low and middle elevations, often in rocky areas or around human habitation
Mountain lion	<i>Puma concolor</i>	Rocky or mountainous areas, especially with many deer
Bobcat	<i>Felis rufus</i>	Rocky upland areas interspersed with open desert, grassland or woodland
Collared peccary	<i>Tayassu tajacu</i>	Desertscrub, especially in thickets along creeks and old streambeds
Mule deer	<i>Odocoileus hemionus</i>	Pine forest, oak woodland, chaparral, upland desert
Bighorn sheep	<i>Ovis canadensis mexicana</i>	Steep rocky or mountainous habitat that provides steep escape terrain, with low-profile vegetation
Source: Harvey et al. 1999; Hoffmeister 1986		

**TABLE D-2  
BIRD SPECIES THAT MAY OCCUR IN THE VICINITY OF THE PROPOSED PROJECT**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>
Pied-billed grebe	<i>Podilymbus podiceps</i>	Lakes, ponds, streams, and canals
Great blue heron	<i>Ardea herodias</i>	Lakes, ponds, streams, canals, and marshes
Snowy egret	<i>Egretta thula</i>	Ponds, streams, and marshes
White-faced ibis	<i>Plegadis chihi</i>	Lakes, ponds, streams, marshes, and fields
Mallard	<i>Anas platyrhynchos</i>	Lakes, ponds, streams, and canals
Cinnamon teal	<i>Anas cyanoptera</i>	Ponds, streams, and canals
Turkey vulture	<i>Cathartes aura</i>	Open country, woodlands, farms
Northern harrier	<i>Circus cyaneus</i>	Wetlands, open fields
Sharp-shinned hawk	<i>Accipiter striatus</i>	Generally distributed
Cooper's hawk	<i>Accipiter cooperii</i>	Broken woodlands or streamside groves
Harris's hawk	<i>Parabuteo unicinctus</i>	Semiarid woodland, brushland
Swainson's hawk	<i>Buteo swainsoni</i>	Fields and desert
Red-tailed hawk	<i>Buteo jamaicensis</i>	Plains, prairie groves, desert
Ferruginous hawk	<i>Buteo regalis</i>	Dry, open country
American kestrel	<i>Falco sparverius</i>	Open country, cities
Prairie falcon	<i>Falco mexicanus</i>	Dry, open country, prairies
Peregrine falcon	<i>Falco peregrinus</i>	Cliffs, generally distributed, tops of tall urban buildings
Gambel's quail	<i>Callipepla gambelii</i>	Desert scrublands and thickets
Killdeer	<i>Charadrius vociferus</i>	Ponds, streams, and fields
White-winged dove	<i>Zenaida asiatica</i>	Dense mesquite, mature citrus groves, riparian woodlands, saguaro-paloverde deserts
Mourning dove	<i>Zenaida macroura</i>	Wide variety of habitats
Common ground dove	<i>Columbina passerina</i>	Fields and hedgerows
Greater roadrunner	<i>Geococcyx californianus</i>	Scrub desert and mesquite groves, less common in chaparral and oak woodland
Barn owl	<i>Tyto alba</i>	Dark cavities in city and farm buildings, cliffs, trees
Western screech owl	<i>Otus kennicottii</i>	Open woodlands, streamside groves, deserts, suburban areas
Great horned owl	<i>Bubo virginianus</i>	Common in wide variety of habitats
Elf owl	<i>Micrathene whitneyi</i>	Desert lowlands, canyons, foothills
Burrowing owl	<i>Athene cunicularia</i>	Open country, golf courses, airports
Lesser nighthawk	<i>Chordeiles acutipennis</i>	Dry, open country, scrubland, desert
Common poorwill	<i>Phalaenoptilus nuttallii</i>	Sagebrush and chaparral slopes
White-throated swift	<i>Aeronautes saxatalis</i>	Mountains, canyons, and cliffs
Black-chinned hummingbird	<i>Archilochus alexandri</i>	Lowlands and low mountains
Anna's hummingbird	<i>Calypte anna</i>	Coastal lowlands, mountains, deserts
Costa's hummingbird	<i>Calypte costae</i>	Desert washes, dry chaparral
Rufous hummingbird	<i>Selasphorus rufus</i>	Suburban and riparian areas
Gila woodpecker	<i>Melanerpes uropygialis</i>	Towns, scrub desert, cactus country, streamside woods
Ladder-backed woodpecker	<i>Picoides scalaris</i>	Dry brushlands, mesquite and cactus country, towns and rural areas
Northern flicker	<i>Colaptes auratus</i>	Open woodlands, suburban areas
Gilded flicker	<i>Colaptes chrysoides</i>	Low desert woodlands, favors saguaro
Pacific-slope flycatcher	<i>Empidonax difficilis</i>	Migrant through lowlands
Say's phoebe	<i>Sayornis saya</i>	Dry, open areas, canyons, cliffs

**TABLE D-2  
BIRD SPECIES THAT MAY OCCUR IN THE VICINITY OF THE PROPOSED PROJECT**

Common Name	Scientific Name	Habitat
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	Wide variety of habitats
Brown-crested flycatcher	<i>Myiarchus tyrannulus</i>	Saguaro desert, river groves, lower mountain woodlands
Western kingbird	<i>Tyrannus verticalis</i>	Dry, open country
Common raven	<i>Corvus corax</i>	Mountains, deserts, coastal areas
Horned lark	<i>Eremophila alpestris</i>	Dirt fields, gravel ridges, shores
Tree swallow	<i>Tachycineta bicolor</i>	Streams, ponds, and lakes
Violet-green swallow	<i>Tachycineata thalassina</i>	Riparian areas, streams, ponds, and lakes
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	Banks of streams and canals, streams, ponds, and lakes
Cliff swallow	<i>Petrochelidon pyrrhonota</i>	Lakeside, cliffs, and canals; nesting under nearby bridges, buildings, and other overhangs; streams and ponds
Verdin	<i>Auriparus flaviceps</i>	Southwestern desert
Cactus wren	<i>Campylorhynchus brunneicapillus</i>	Cholla cactus habitat
Rock wren	<i>Salpinctes obsoletus</i>	Arid and semiarid habitats
Canyon wren	<i>Catherpes mexicanus</i>	Canyons and cliffs, often near water
Bewick's wren	<i>Thryomanes bewickii</i>	Wooded riparian areas
Ruby-crowned kinglet	<i>Regulus calendula</i>	Woodlands, thickets
Black-tailed gnatcatcher	<i>Poliophtila melanura</i>	Desert, especially washes
Northern mockingbird	<i>Mimus polyglottos</i>	Variety of habitats
Bendire's thrasher	<i>Toxostoma bendirei</i>	Open farmlands, grasslands, brushy desert
Curve-billed thrasher	<i>Toxostoma curvirostre</i>	Cholla deserts and suburban areas
Phainopepla	<i>Phainopepla nitens</i>	Riparian areas, especially in trees with mistletoe
Loggerhead shrike	<i>Lanius ludovicianus</i>	Generally distributed
European starling	<i>Sturnus vulgaris</i>	Generally distributed
Orange-crowned warbler	<i>Vermivora celata</i>	Riparian and suburban areas in lowlands
Lucy's warbler	<i>Vermivora luciae</i>	Mesquites and cottonwoods along watercourses
Yellow-rumped warbler	<i>Dendroica coronata</i>	Riparian and suburban areas
Wilson's warbler	<i>Wilsonia pusilla</i>	Dense, moist woodlands, bogs, streamside tangles
Western tanager	<i>Piranga ludoviciana</i>	Transient in lowlands
Green-tailed towhee	<i>Pipilo chlorurus</i>	Brushy areas, riparian, and suburban areas
Canyon towhee	<i>Pipilo fuscus</i>	Sonoran desertscrub
Abert's towhee	<i>Pipilo aberti</i>	Riparian areas, suburban areas
Chipping sparrow	<i>Spizella pallida</i>	Brushy edges and riparian areas
Brewer's sparrow	<i>Spizella breweri</i>	Deserts, field edges, and suburban areas
Vesper sparrow	<i>Pooecetes gramineus</i>	Open weedy fields, roadsides, and grassy areas
Lark sparrow	<i>Chondestes grammacus</i>	Brushy, weedy areas, riparian areas, and field edges
Black-throated sparrow	<i>Amphispiza bilineata</i>	Desertscrub
Lark bunting	<i>Calamospiza melanocorys</i>	Brushy desert and field edges
Savannah sparrow	<i>Passerculus sandwichensis</i>	Open fields, roadsides, and grassy areas
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	Suburban, riparian, and other brushy areas
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	Transient in lowlands
Northern cardinal	<i>Cardinalis cardinalis</i>	Woodland edges, swamps, streamside thickets, suburban gardens

**TABLE D-2  
BIRD SPECIES THAT MAY OCCUR IN THE VICINITY OF THE PROPOSED PROJECT**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>
Pyrrhuloxia	<i>Cardinalis sinuatus</i>	Thorny brush, mesquite thickets, desert, woodland edges, ranchlands
Lazuli bunting	<i>Passerina amoena</i>	Weedy and shrubby areas along irrigation ditches and other bodies of water and suburban areas
Western meadowlark	<i>Sturnella neglecta</i>	Fields and other open areas, deserts
Brown-headed cowbird	<i>Molothrus ater</i>	Suburbs and agricultural areas
Hooded oriole	<i>Icterus cucullatus</i>	Riparian and suburban areas
House finch	<i>Carpodacus mexicanus</i>	Riparian and suburban areas, farmland, desert
Lesser goldfinch	<i>Carduelis psaltria</i>	Riparian areas, brushy desert scrub

Sources: National Geographic Society 2002; Witzeman et al. 1997

**TABLE D-3  
REPTILE AND AMPHIBIAN SPECIES THAT MAY OCCUR IN THE  
VICINITY OF THE PROPOSED PROJECT**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>
Sonoran desert toad	<i>Bufo alvarius</i>	Ranges from arid mesquite-creosote bush lowlands and arid grasslands into the oak-sycamore-walnut groves in mountain canyons, often found near permanent water of springs, reservoirs, canals, and streams, but also frequents temporary pools
Great plains toad	<i>Bufo cognatus</i>	Inhabits prairies or deserts, often breeding after heavy rains in summer in shallow temporary pools or quiet water of streams, marshes, irrigation ditches, and flooded fields, frequents creosote bush desert, mesquite woodland, and sagebrush plains
Red-spotted toad	<i>Bufo punctatus</i>	Desert streams and oases, open grassland and scrubland, oak woodland, rocky canyons and arroyos, in crevices among rocks for shelter, breeds in rain pools, reservoirs, and temporary pools of intermittent streams
Southwestern woodhouse toad	<i>Bufo woodhousei australis</i>	Grassland, sagebrush flats, woods, desert streams, valleys, floodplains, farms, and city backyards, in sandy areas, breed in quiet water of streams, marshes, lakes, freshwater pools, and irrigation ditches
Couch spadefoot	<i>Scaphiopus couchii</i>	Frequents shortgrass plains, mesquite savannah, creosote bush desert, thornforest, tropical deciduous forest, and other areas of low rainfall
Southern spadefoot	<i>Spea multiplicata</i>	Frequents desert grassland, shortgrass plains, creosote bush and sagebrush desert, mixed grassland and chaparral, piñon-juniper and pine-oak woodlands, and open pine forests, soil is often sandy or gravelly
Sonoran desert tortoise	<i>Gopherus agassizii</i>	Completely terrestrial desert species requiring firm but not hard ground for construction of burrows, frequent desert oases, riverbanks, washes, and rocky slopes
Eastern collared lizard	<i>Crotaphytus collaris</i>	Rock-dwelling lizard that frequents canyons, rocky gullies, limestone ledges, mountain slopes, and boulder-strewn alluvial fans, usually where vegetation is sparse
Long-nosed leopard lizard	<i>Gambelia wislizenii wislizenii</i>	Arid and semiarid plains grown to bunch grass, alkali bush, sagebrush, creosote bush, or other scattered low plants, ground may be hardpan, gravel, or sand
Western banded gecko	<i>Coleonyx variegatus</i>	Variety of habitats, often associated with rocks
Gila monster	<i>Heloderma suspectum</i>	Canyon bottoms and washes in desert or desert grassland
Desert iguana	<i>Dipsosaurus dorsalis</i>	Creosote bush desert to subtropical scrub, most common in sandy habitats but also occurs along rocky streambeds, on bajadas, silty floodplains, and on clay soils
Common chuckwalla	<i>Sauromalus obesus</i>	Rock-dwelling, herbivorous lizard, widely distributed in the desert
Zebra-tailed lizard	<i>Callisaurus draconoides</i>	Frequents washes, desert pavements of small rocks, and hardpan

**TABLE D-3  
REPTILE AND AMPHIBIAN SPECIES THAT MAY OCCUR IN THE  
VICINITY OF THE PROPOSED PROJECT**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>
Desert horned lizard	<i>Phrynosoma platyrhinos</i>	Arid lands on sandy flats, alluvial fans, along washes, and at the edges of dunes, associated with creosote bush, saltbush, greasewood, cactus, and ocotillo in the desert
Regal horned lizard	<i>Phrynosoma solare</i>	Frequents rocky and gravelly habitats of the arid and semiarid plains, hills, and lower slopes of mountains, often with cactus, mesquite, and creosote bush
Desert spiny lizard	<i>Sceloporus magister</i>	Arid and semiarid regions on plains and lower slopes of mountains, found in Joshua tree, creosote bush, and shade-scale deserts, mesquite-yucca grassland, juniper and mesquite woodland, subtropical thornscrub, and along rivers grown to willows and cottonwoods
Brush lizard	<i>Urosaurus graciosus</i>	Desert species, frequents areas of loose sand and scattered bushes and trees, creosote bush, burrobrush, galleta grass, catclaw, mesquite, and paloverde
Tree lizard	<i>Urosaurus ornatus</i>	Frequents mesquite, oak, pine, juniper, alder, cottonwood, and non-native trees such as tamarisk and rough-bark eucalyptus, but also may occur in treeless areas, especially attracted to river courses
Side-blotched lizard	<i>Uta stansburiana</i>	Arid or semiarid regions with sand, rock, hardpan, or loam with grass, shrubs, and scattered trees, often found along sandy washes
Western whiptail	<i>Cnemidophorus tigris</i>	Inhabits deserts and semiarid habitats, usually where plants are sparse, also found in woodland, streamside growth, and in the warmer, drier parts of forests
Banded sand snake	<i>Chilomeniscus cinctus</i>	Loose soils in low desert or upland
Rosy boa	<i>Charina trivirgata</i>	Rocky shrublands and desert, particularly near water source
Western glossy snake	<i>Arizona occidentalis</i>	Below 6,000 feet in sparsely vegetated woodland, chaparral, grassland or desertscrub with loose soil
Western shovel-nosed snake	<i>Chionactis occipitalis</i>	Sparsely vegetated desert areas with pockets of loose soil
Night snake	<i>Hypsiglena torquata</i>	Various upland and desert habitats used
Coachwhip	<i>Masticophis flagellum</i>	Sparsely vegetated areas from juniper woodland to low desert
Saddled leaf-nosed snake	<i>Phyllorhynchus browni</i>	Desertscrub
Spotted leaf-nosed snake	<i>Phyllorhynchus descortatus</i>	Open desert with finer loose soils, especially creosote bush ( <i>Larrea tridentata</i> )
Gopher snake	<i>Pituophis catenifer</i>	Various habitats from mountain to low desert and coastal
Long-nosed snake	<i>Rhinocheilus lecontei</i>	Desertscrub, prairie, tropical woodland to 5,500 feet
Western patch-nosed snake	<i>Salvadora hexalepis</i>	Piñon-juniper woodland to low deserts on variety of soil types
Glossy snake	<i>Arizona elegans</i>	Sandy or loamy open areas – light shrubby to barren desert, sagebrush flats, grassland, chaparral-covered slopes, and woodland
Common kingsnake	<i>Lampropeltis getulus</i>	Woodland, swampland, coastal marshes, river bottoms, farmland, prairie, chaparral, and desert

**TABLE D-3**  
**REPTILE AND AMPHIBIAN SPECIES THAT MAY OCCUR IN THE**  
**VICINITY OF THE PROPOSED PROJECT**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Habitat</b>
Ground snake	<i>Sonora semiannulata</i>	Wide range of habitats in loose soil with some subsurface moisture
Lyre snake	<i>Trimorphodon biscutatus</i>	From oak and juniper woodland to higher elevation desert and grasslands, particularly in rocky areas
Western coral snake	<i>Micruroides euryxanthus</i>	Wide range of arid habitats including grassland, woodland, scrub and agricultural lands, particularly upland desert in washes and river bottoms
Western blind snake	<i>Leptotyphlops humilis</i>	Desertscrub and brush covered hillsides with loose soils
Western diamondback rattlesnake	<i>Crotalus atrox</i>	Wide range of habitats below 7,000 feet
Southwestern speckled rattlesnake	<i>Crotalus mitchellii</i>	From juniper woodland to succulent desert, often in rocky areas
Tiger rattlesnake	<i>Crotalus tigris</i>	Rocky desert canyons and foothills
Source: Degenhardt et al. 1996; Stebbins 2003.		

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# EXHIBIT E

**EXHIBIT E**  
**SCENIC AREAS, HISTORIC SITES**  
**AND STRUCTURES, ARCHAEOLOGICAL SITES**

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## **EXHIBIT E**

### **SCENIC AREAS, HISTORIC SITES AND STRUCTURES, AND ARCHAEOLOGICAL SITES**

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R-14-3-219:

*“Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon.”*

Exhibit E includes summaries of existing visual and cultural resources, as well as the potential impacts the Proposed Route and Proposed Alternate Route may have on each resource. For further information refer to the EA, provided under separate cover as Exhibit B-1.

#### **SCENIC AREAS AND VISUAL RESOURCES**

##### **Overview**

The visual resource study included agency visual resource management classes, scenic quality, key observation points (KOPs), and visibility related to the construction, operation, and maintenance of the proposed transmission line and substation/switchyard facilities. The visual analysis was conducted in compliance with the BLM's Visual Resource Management System (VRM) (Manual 8410-1 1996) and addresses the potential visual effects of the proposed project on landscape scenic quality, sensitive viewers, and compliance with VRM classifications. Data were collected 2 miles on either side (4-mile buffer total) of the assumed centerline(s) of the proposed routes in order to characterize the visual resources in the study area including scenery, KOPs, and established VRM classes. A description of the Proposed Route is described initially, followed by a description of potential impacts specific to the Proposed Alternate Route, if any.

##### **Existing Conditions – Proposed Route**

##### **Landscape Character**

The project study area is located within the Basin and Range Physiographic province in southwest Arizona (Fenneman 1931). The topographic character within the general study area can be described as generally flat with intermittent rolling hills in the southern portion of the study area and areas of bajada and foothills associated with the Belmont Mountains in the northern portion of the study area. A portion of the Palo Verde Hills adjacent to Saddle Mountain is crossed by the proposed project near the proposed Harquahala Junction 500kV Switchyard along Link 30. The proposed project also crosses the Hassayampa River and associated terrace lands along Link 120. There are two areas of visual interest, including portions of Saddle Mountain and the Palo Verde Hills in the southern portion of the study area and the

foothills of the Belmont Mountains north of the CAP Canal and west of Wickenburg Road. A very small portion of the Big Horn Mountains Wilderness Area is located in the northwestern portion of the study area, approximately 2 miles from the proposed transmission line route.

The predominant vegetation character of the study area is representative of the Lower Sonoran Desert. Creosote and bursage are dominant plant species throughout the study area where saline soils are abundant. Xeroriparian washes supporting catclaw acacia and blue paloverde occur throughout the area as well, particularly along the north side of the CAP Canal.

Infrastructure/cultural modifications that affect the natural landscape setting include the PVNGS and ancillary facilities; Hassayampa Switchyard; Mesquite and Arlington Power plants; I-10; CAP Canal (including structural berms and the Hassayampa Pumping Plant); and existing Palo Verde-Devers No. 1 and Harquahala-Hassayampa 500kV transmission lines and access roads. The CAP facility (canal, roads, flood control berm) and the two 500kV transmission lines are located within BLM-designated utility corridors on federal lands and would be paralleled by the proposed project. Additional modifications include three 230kV transmission lines (one of which is associated with the Hassayampa Pumping Plant), a 345kV transmission line, two additional 500kV transmission lines, and two mining operations. A natural gas pipeline and a mining operation are located in the central portion of the study area. Several 12kV distribution lines are located in the northern and southern portions of the study area along roads and near residential areas.

## Scenic Quality

Scenic Quality Rating Units (SQRUs) are used by the BLM to describe specific natural landscape types and cultural modifications found within the regional landscape. The designations are categorized into three classes—A (outstanding), B (above average), and C (common). The degree of diversity and variety of visual elements (i.e., landform, vegetation, color, etc.) associated with the previously described landscape character were used to derive the SQRUs along the proposed project.

A majority of the Proposed Route would cross Class C landscapes, which are primarily associated with large expanses of creosote plants and little, if any, topographical features. Class B landscapes that would be crossed by the Proposed Route are associated with the foothills in the vicinity of both Saddle Mountain and the Belmont Mountains, as well as desert washes, which exhibit a greater diversity of vegetation than that of the surrounding landscape (portions of Links 30, 90, 100, 120, and 130). The Hassayampa River floodplain is considered a Class B landscape due to its topographic and vegetative diversity and also would be crossed by the Proposed Route. Other areas that were designated Class B and crossed by the proposed project include agricultural lands near the PV Hub, and isolated desert hills in the southern portion of the study area. Due to the topographical and vegetative diversity of Saddle Mountain and the Belmont Mountains, these landscapes were designated as Class A landscapes.

## **Sensitive Viewpoints**

Visual sensitivity reflects the degree of concern for change in the scenic quality of the natural landscape or existing conditions from a key viewing point in the study area. Sensitive viewers identified within the study area include residential, travel route, and recreation viewers as described below.

### Residential Viewers

Residential development in the study area occurs near the PVNGS, along Elliot Road in the southern portion of the study area, near the Salome and Tonopah-Salome highways south of I-10, and in areas south of the CAP Canal and west of Wickenburg Road. A total of four residences were identified within 0-½ mile of the Proposed Route and would have views of the proposed transmission line. One of these residences is located in the southern portion of the study area and has views of the existing Palo Verde-Devers No. 1 and Harquahala-Hassayampa 500kV transmission lines. The other three residences are located on the south side of the CAP Canal in the northern portion of the study area and have views of the existing CAP facility.

The majority of private and State Trust land is planned for future residential development as indicated in Exhibit A-4. Future residential viewers within the study area are primarily associated with the Belmont, Douglas Ranch, Festival Ranch, Sun City Festival, Sun Valley, and Trillium proposed master plan community developments. Other future residential viewers also may be associated with platted subdivisions and land designated as rural residential/planned community areas within Maricopa County and the Town of Buckeye.

### Recreation Viewers

There are no defined trails or trailheads within the study area. The Proposed Route would not cross the Big Horn Mountains Wilderness Area. The southern boundary of the wilderness area is approximately 2 miles northwest of the proposed transmission line route. As a result of these conditions, there would be only intermittent and modified distant views of the Proposed Route from the wilderness area. All other recreation within the study area is widely dispersed.

Portions of the study area have been identified as potential Priority Three and Four corridors for the future MCRT; however, these corridors have not been identified as key components of the MCRT at this time and may be subject to further study.

## Transportation Viewers

Travelers along I-10 would have views of the Proposed Route; however, these views have been modified by the existing Palo Verde-Devers No. 1 transmission line. The Burnt Well Rest Area, maintained by the Arizona Department of Transportation, is located within the study area along I-10 although views of the Proposed Route are screened by topography.

Other transportation routes within the study area that would have views of the Proposed Route are Wintersburg Road, Elliot Road, the Salome and Tonopah-Salome highways, Courthouse Road, Sun Valley Parkway, and Wickenburg Road.

## **Agency Management Objectives**

The proposed routes do not cross any Class I landscapes and primarily crosses VRM Class III or IV landscapes and isolated Class II areas near Saddle Mountain and in the foothills of the Belmont Mountains. Because the Proposed Route and Proposed Alternate Route will parallel one or two existing transmission line(s) or the CAP Canal and would be located in BLM-designated utility corridors, the proposed routes will comply with VRM objectives (see Appendix B of Exhibit B-1).

## **Potential Impacts – Proposed Route**

No high impacts to visual resources are anticipated as a result of the construction, operation, and maintenance of the Proposed Route. The majority of impacts that are anticipated to occur are low with isolated areas of moderate impact. Low impacts primarily occur because (1) the proposed project would parallel either one or two existing 500kV transmission lines, a 230kV transmission line, and/or the CAP Canal; (2) the Proposed Route would be located in a designated BLM utility corridor on BLM-managed land; (3) sensitive viewers only occur along the proposed project in small, dispersed groups with partially screened views of the proposed project; and (4) structure types and spans will match existing facilities to reduce the visibility of the proposed project. Moderate impacts could occur where isolated residential viewers are located immediately adjacent to the proposed project with direct unimpeded views.

## **Scenic Quality**

Low impacts to scenic quality will occur for the majority of the Proposed Route because the transmission line will parallel existing 500kV transmission lines or the CAP Canal within BLM-designated utility corridors and within Class C landscapes. Moderate impacts are anticipated for small portions of the foothills of the Belmont Mountains and Palo Verde Hills and isolated areas of Class B landscapes where dense vegetation exists in the form of xeroriparian stringers, green-up areas adjacent to the CAP Canal, and in areas of moderate saguaro density. However, these

impacts will be minimized because the Proposed Route will parallel one or two existing 500kV transmission lines or the CAP Canal within BLM-designated utility corridors.

## Sensitive Viewers

### Residential Viewers

Impacts that may occur to residential viewers as a result of the construction, operation, and maintenance of the Proposed Route are anticipated to range from primarily low to moderate. Low impacts occur where the residences are typically located over ½ mile from the proposed project. In addition, the existing conditions adjacent to these residences have been locally modified by one to two existing 500kV transmission lines along the southern and central portions of the Proposed Route (Links 10, 20, 30 and 50), and the CAP Canal and flood retaining structure along the northern portions of the Proposed Route (Links 60, 80, 90, 100, 110, 120, and 130). Low-moderate to moderate impacts could potentially occur to three residences within ½ mile south of the CAP Canal and one residence within ½ mile of the Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV transmission lines. However, the dominance of the CAP Canal and the existing 500kV transmission lines reduces the contrast associated with the Proposed Route. Exhibits G-7 through G-9 simulate the Proposed Route as seen by residential viewers south of the CAP Canal.

Impacts to future residential viewers are anticipated to be low because the Proposed Route would directly parallel one to two existing 500kV transmission lines, a 230kV transmission line, and/or the CAP Canal.

### Recreation Viewers

Low impacts to recreational viewers are anticipated to occur as a result of the construction, operation, and maintenance of the Proposed Route. There are no formally designated or defined trails, parks, or trailheads within the project study area; however, dispersed recreation viewers may be located adjacent to the Belmont Mountains (Links 60 and 90). Viewers from this area typically will have intermittent screened views of the Proposed Route, which result in a reduction of contrast. Furthermore, the Proposed Route will parallel existing visually dominant features, including one to two 500kV transmission lines and the CAP Canal, within a BLM-designated utility corridor. Exhibit G-10 illustrates the Proposed Route from a superior viewpoint in an area used for dispersed recreation adjacent to the Belmont Foothills. Views of the Proposed Route from the Big Horn Mountains Wilderness Area are distant (2 miles or more) and partially screened by vegetation, reducing project visibility.

A segment of the future MCRT alignment parallels the CAP Canal. The MCRT may be placed either north or south of the CAP Canal based on the final alignment. The MCRT alignment on

either the northern or southern side of the CAP Canal would have predominantly low visual impacts.

### Transportation Views

Impacts to moderate and high sensitivity travel route viewers will range from low to moderate. Impacts to Elliot, Wintersburg, and Courthouse roads, Salome and Tonopah Salome highways, I-10, and Sun Valley Parkway will be low because the Proposed Route would parallel existing transmission facilities. Furthermore, varied topography and vegetation results in a variety of viewing conditions (screening and backdropping) that reduce the visibility of the Proposed Route. Exhibit G-11 depicts the Proposed Route as seen by a westbound viewer on I-10. Moderate impacts could occur to viewers using Wickenburg Road (Link 120); however, because the Proposed Route will cross Wickenburg Road at approximately a right angle and parallel an existing dominant linear feature (the CAP Canal) impacts will be minimized. Exhibit G-12 illustrates the Proposed Route as seen by viewers using Wickenburg Road. Additionally, Exhibit G-13 simulates the proposed Harquahala Junction Switchyard as seen by eastbound travelers along I-10.

### **Potential Impacts - Proposed Alternate Route**

The visual assessment for the Proposed Alternate Route is identical to the Proposed Route with the exception of Link 70. The potential differences in impacts from the Proposed Route are to scenic quality and residential viewers. Low to moderate impacts to scenic quality could occur in very small portions north of the CAP Canal in areas with moderate densities of saguaros or near green-up areas. Potential impacts to residences south of the CAP Canal would be less than the Proposed Route because Link 70 would be located ½ mile farther north reducing visibility and subsequent impacts. Low to moderate impacts could occur to three residences within ½ mile south of the CAP Canal and one residence within ½ mile of the Palo Verde-Devers No. 1 and Harquahala-Hassayampa 500kV transmission lines if the Proposed Alternate Route is constructed; however, the use of dull-grey steel structures and non-specular conductors would minimize contrast. Exhibits G-14 through G-16 simulate the Proposed Alternate Route as seen by residential viewers south of the CAP Canal. Low impacts are anticipated to future residential viewers because the Proposed Alternate Route will parallel an existing dominant linear feature (CAP Canal). Exhibit G-17 illustrates the Proposed Alternate Route from an elevated viewpoint in an area used for dispersed recreation adjacent to the Belmont Foothills.

## HISTORIC SITES AND STRUCTURES AND ARCHAEOLOGICAL SITES

### Overview

A cultural resource study was conducted to determine whether any historic sites and structures or archaeological sites are located in the vicinity of the proposed project and how they might be affected by the construction of the project (Luhnnow and Darrington 2005). This study involved both a records review and intensive pedestrian survey of the proposed area of potential effect (APE). A cultural survey report was submitted to the BLM Phoenix Field Office, Bureau of Reclamation, and Arizona State Land Department (ASLD) to support their compliance with state and federal regulations concerning the protection of cultural resources. In addition, the BLM sent copies of the study to the following eight Native American tribes for their review:

- Hopi Tribe
- Salt River Pima-Maricopa Community
- Yavapai-Apache Nation
- Yavapai-Prescott Indian Tribe
- Ak-Chin Indian Community
- Fort McDowell Yavapai Nation
- Gila River Indian Community
- Fort Mojave Tribal Council

Cultural resource information was reviewed from a number of agencies, including:

- Arizona State Historic Preservation Office (SHPO)
- National Register of Historic Places (NRHP)
- Arizona State Register of Historic Places
- State Office and Phoenix Field Office of the Bureau of Land Management
- AZSITE database (<http://azsite.asu.edu/azsiteweb/>)

The purpose of the review was to identify any prior research or previously recorded sites located within a 1-mile radius of the proposed project. The objective of the intensive pedestrian survey was to specifically identify those sites that may be potentially affected by the proposed project.

### Findings

The cultural resource study that was conducted in support of the proposed projects identified 7 previously recorded sites and 6 newly recorded sites within the APE (Table E-1). In addition, 84 isolated occurrences (IOs) of cultural materials were identified, of which IO 30, IO 58, and IO 65) are recommended for collection prior to construction because they represent potentially reconstructable ceramic vessels.

**TABLE E-1  
SUMMARY OF SITES LOCATED WITHIN THE APE**

<b>Site number</b>	<b>Recording Status</b>	<b>Jurisdiction</b>	<b>Description</b>	<b>Eligibility</b>
AZ S:12:35 (ASM)	Newly Recorded	BLM Phoenix Field Office	Prehistoric artifact scatter consisting of five flaking stations	Not eligible
AZ S:12:36 (ASM)	Newly Recorded	BLM Phoenix Field Office/ ASLD	Historic mining site	Eligible
AZ S:12:37 (ASM)	Newly Recorded	Private	Historic artifact scatter	Not eligible
AZ T:5:25 (ASM)	Newly Recorded	BLM Phoenix Field Office	Prehistoric Hohokam artifact scatter	Not eligible
AZ T:9:86 (ASM)	Newly Recorded	Private	Prehistoric Hohokam ceramic scatter	Not eligible
AZ T:9:87 (ASM)	Newly Recorded	Private	Prehistoric Hohokam ceramic scatter	Not eligible
AZ S:12:32 (ASM)	Re-recorded	BLM Phoenix Field Office	Historic mining site	Not eligible
AZ T:9:12 (ASM)	Re-recorded	BLM Phoenix Field Office	Prehistoric rock feature with associated lithics	Eligible
AZ T:9:13 (ASM)	Re-recorded	BLM Phoenix Field Office	Three rock rings (disturbed) of unknown age	Not eligible
AZ T:9:21 (ASM)	Re-recorded	Private	Prehistoric artifact scatter with features	Eligible
AZ T:9:48 (ASM)	Re-recorded	Private	Historic artifact scatter	Not eligible
AZ T:9:64 (ASM)	Re-recorded	BLM Phoenix Field Office	Prehistoric lithic and ceramic scatter	Eligible
AZ T:9:65 (ASM)	Re-recorded	Private	Historic homestead	Eligible

Of the 13 sites identified, 5 are recommended as eligible for listing on the NRHP. Given the size and location of these sites, there is good potential for the proposed project to avoid them. The cultural resource study that was prepared included a research design and collection methodology for the three IOs to be retrieved and an archaeological avoidance monitoring plan to address any discovery situation that may occur during construction.

**Potential Impacts – Proposed Route**

The intensive pedestrian survey conducted in support of the proposed project resulted in the identification of 6 newly recorded sites, 84 IOs, and the revisiting of 7 previously recorded sites.

In addition to the sites identified by the intensive pedestrian survey, IOs 30, 58, and 65, which are potentially reconstructable ceramic vessels, were identified. It is recommended that these vessels be collected for possible reconstruction prior to the commencement of construction.

The extreme southeastern corner of the proposed Jagow Well/Palo Verde Hills Archaeological District potentially falls within the APE of the proposed project, along Link 10. This portion is in the southeastern corner of the proposed district and crosses one site, AZ T:9:48 (ASM). This site is a historic artifact scatter, and is recommended as not eligible for listing on the NRHP. Intensive survey of that portion of the proposed district that potentially falls along Link 10 identified no additional cultural resources.

It may be possible to avoid all of the NRHP eligible sites by spanning through careful positioning of the structure locations. If avoidance is possible, the proposed project would have no effect to historic properties. If avoidance of those sites that are recommended as eligible for inclusion on the NRHP is not possible, a treatment plan would be developed and implemented.

In addition, cultural resource avoidance monitoring during construction is recommended when ground-disturbing activities occur within 500 feet of a NRHP eligible site. This will help minimize the potential for any indirect impact to cultural resources.

#### **Potential Impacts – Proposed Alternate Route**

Impacts associated with the Proposed Alternate Route are anticipated to be similar to those for the Proposed Route. The development of new access for the construction, operation, and maintenance of Link 70 of the Proposed Alternate Route will result in greater surface disturbance and therefore a higher potential for impacts to cultural resources.

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### Cultural Resources

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# EXHIBIT F

**EXHIBIT F**  
**RECREATIONAL PURPOSES AND ASPECTS**

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## EXHIBIT F

### RECREATIONAL PURPOSES AND ASPECTS

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“State the extent, if any, the proposed site or route will be available to the public for recreational purposes, consistent with safety considerations and regulations and attach any plans the applicant may have concerning the development of the recreational aspects of the proposed site or route.”*

There are no plans at present to formally designate land within the requested right-of-way for public recreational purposes. The Applicant shall affirmatively offer to work with the affected jurisdictions to join in long-range plans for the corridor. Portions of both the Proposed Route and Proposed Alternate Route will be located on land managed by the BLM as utility/multiple-use corridors including dispersed and informal recreation uses. The location of the transmission line facilities in these areas are consistent with recreation opportunity spectrum management objectives and will not restrict continued informal recreational activity.

As noted in Exhibit B of this Application, the Maricopa County Board of Supervisors approved the Maricopa County Regional Trail System Plan in 2004, which identifies future trail corridors throughout the county. The plan identifies corridors according to segments with a corresponding priority level. Three corridors identified in the plan are located within the study area including two portions of the CAP Canal and the Old Camp Wash in the northern and southern portions of the study area. The portion of the proposed Maricopa County Regional Trail (MCRT) along the CAP Canal within the Town of Buckeye was identified as a Priority Three segment. Priority Three segments are identified as “regional corridors that are not key components of the regional trail system at this time, but may become important future trails” (Maricopa County Trail Commission 2004). The remaining portion of the corridor along the CAP Canal in unincorporated Maricopa County and the corridor along the Old Camp Wash were identified as Priority Four segments. These segments were identified as future trail corridors (5 miles wide) worthy of further study.

According to Maricopa County Department of Transportation (MCDOT), there is 20 feet of space available from the BOR and CAWCD on the southern side of the CAP Canal for potential trail development. MCDOT indicated that future trail development would therefore likely occur on the southern side of the CAP Canal (Kempton 2004). The Proposed Route and Proposed Alternate Route are anticipated to have minimal impacts on recreational uses associated with the future MCRT. The proposed transmission line would be located on the northern side of the CAP Canal within a BLM-designated utility corridor and the portion of the trails which would parallel the CAP Canal would be located on the southern side of the facility. No other plans exist to develop recreational facilities within the requested right-of-way.

## REFERENCES

Kempton, Reed. 2004. Personal communication with Maricopa County Department of Transportation (MCDOT) Regional Trail Development Director. May.

Maricopa County Trail Commission. 2004. Maricopa County Regional Trail System Plan. August.

# EXHIBIT G

**EXHIBIT G**  
**CONCEPTS OF TYPICAL FACILITIES**

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## EXHIBIT G

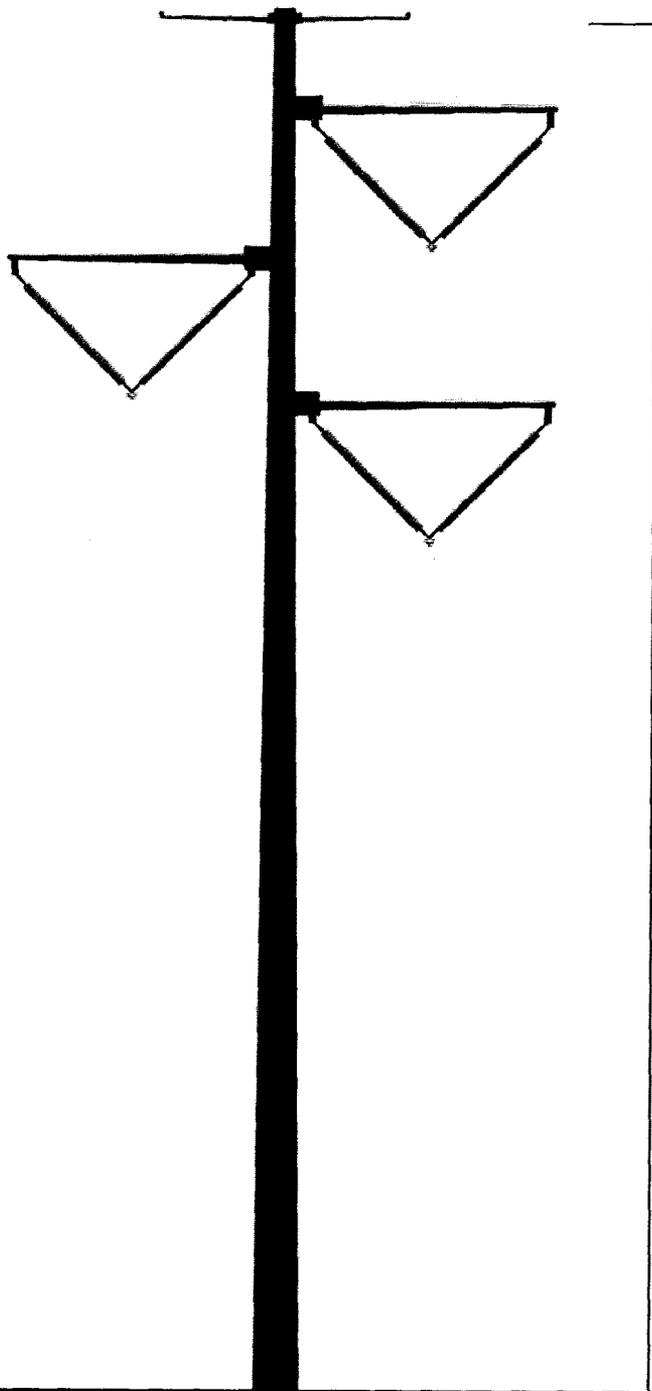
### CONCEPTS OF PROPOSED FACILITIES

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

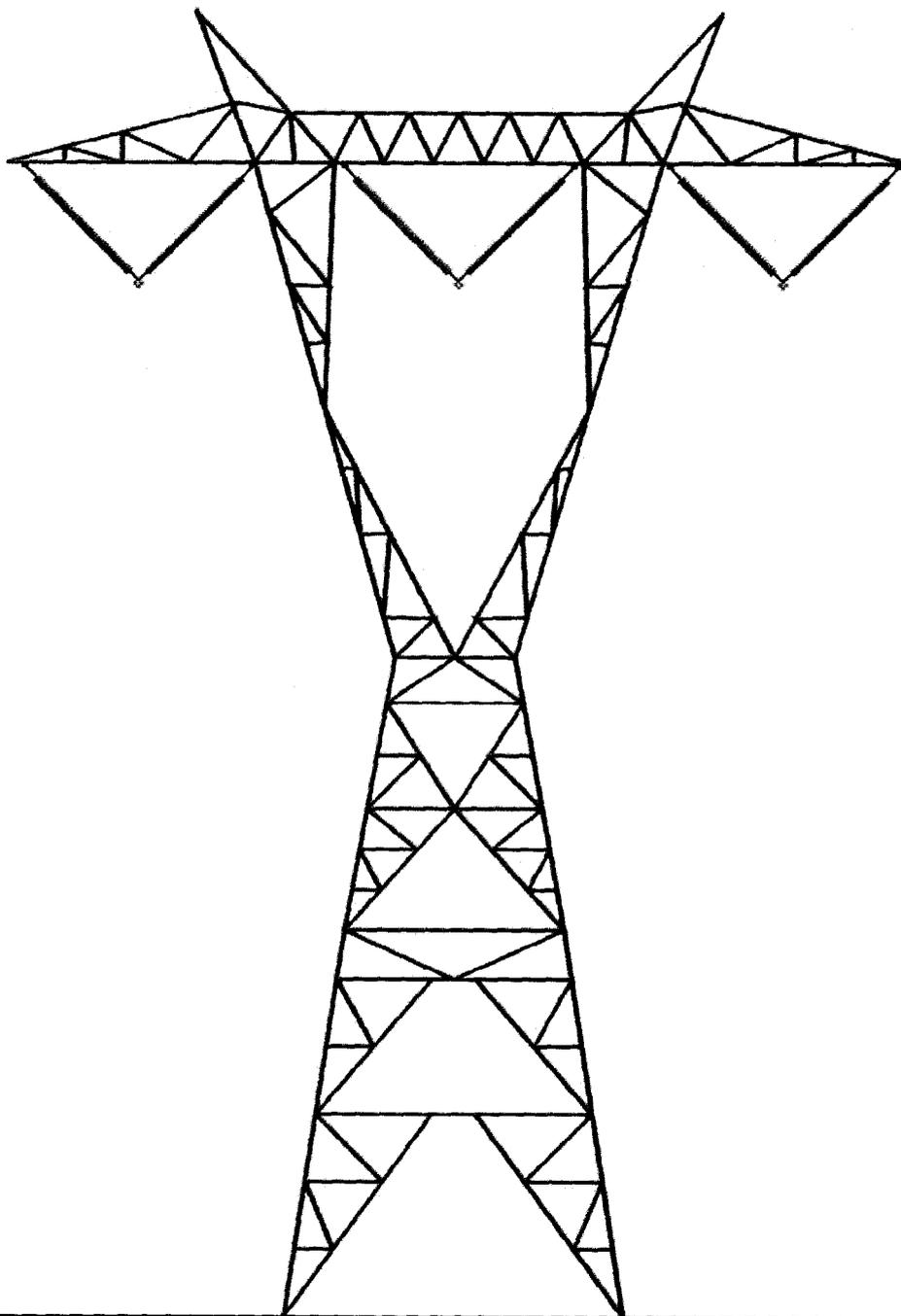
*“Attach any artist’s or architect’s conception of the proposed plant or transmission line structures and switchyards, which applicant believes may be informative to the committee.”*

Exhibit G-1 to G-4	Typical 500kV Structures
Exhibit G-5	Modified 500kV Structure
Exhibit G-6	Typical 500kV Switchyard Arrangement
Exhibit G-7 to G-17	Simulations



Typical  
Height  
135'

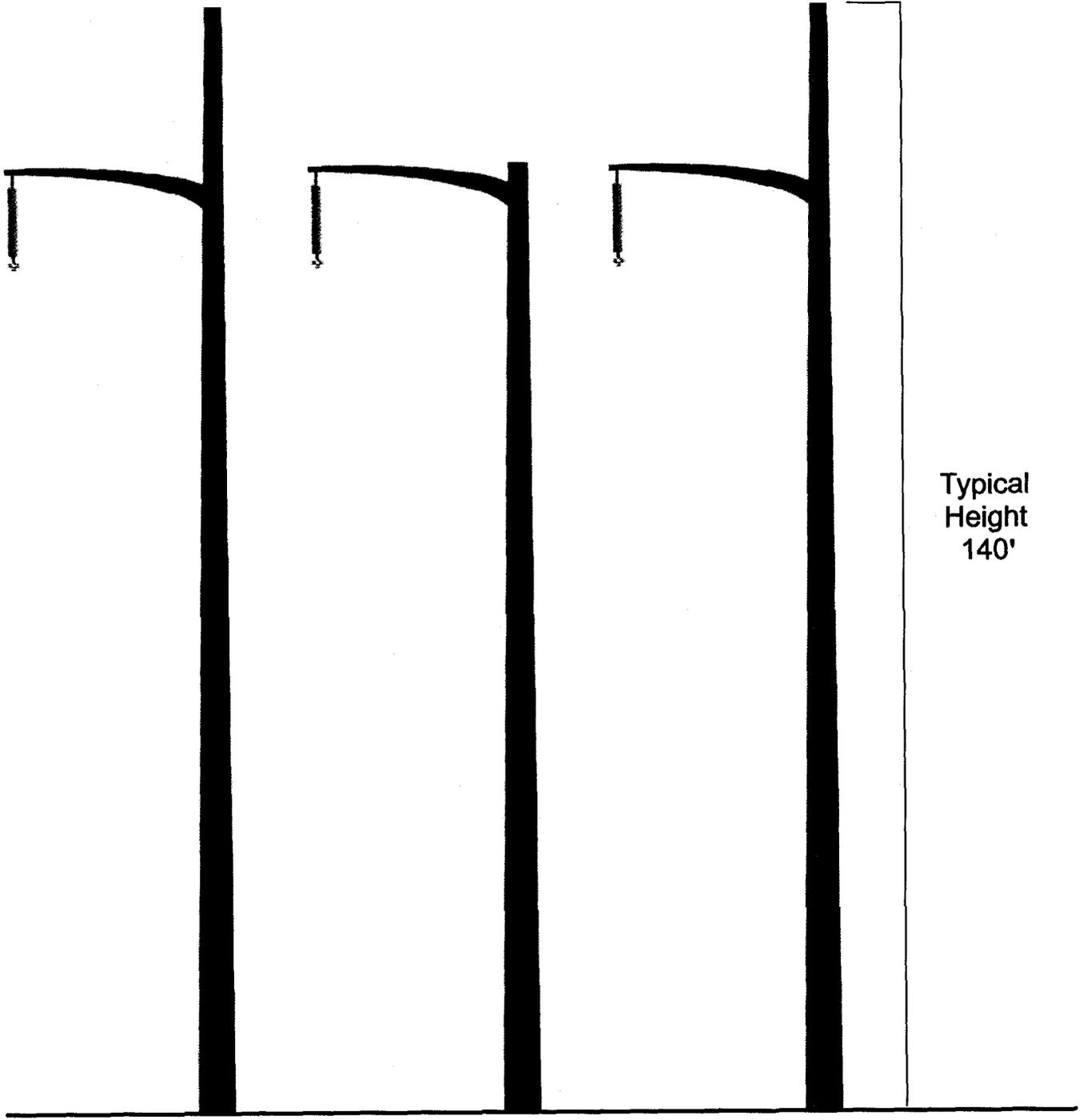
**Exhibit G-1**  
**Typical 500kV Single Circuit Tangent Steel Pole**



Typical  
Height  
135'

**Exhibit G-2**

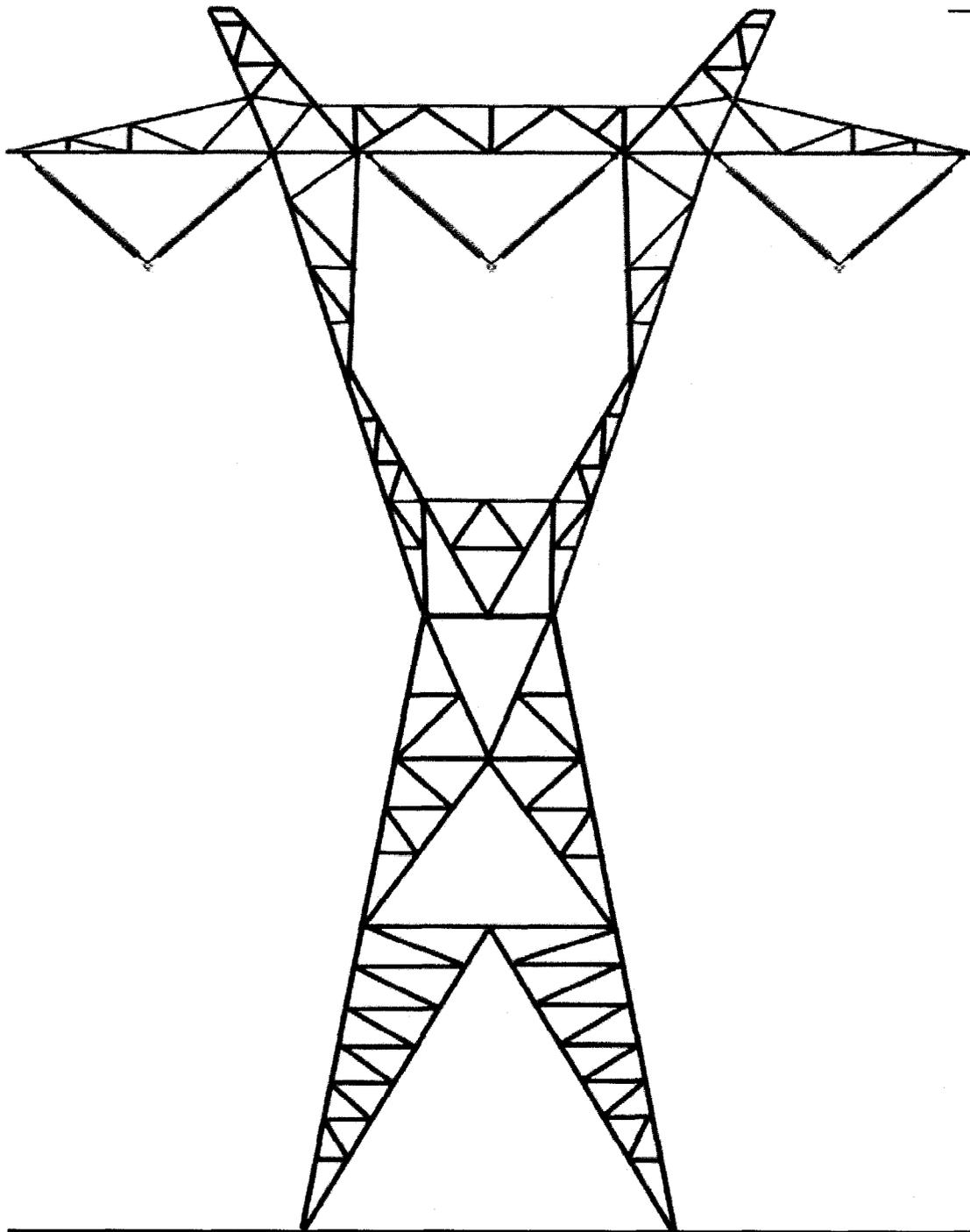
**Typical 500kV Single-Circuit Tangent Steel Lattice Structure**



Typical  
Height  
140'

**Exhibit G-3**

**Typical 500kV Single-Circuit Dead-End Steel Three-Pole Structure**



Typical  
Height  
140'

**Exhibit G-4**  
**Typical 500kV Single-Circuit Dead-End Steel Lattice Structure**

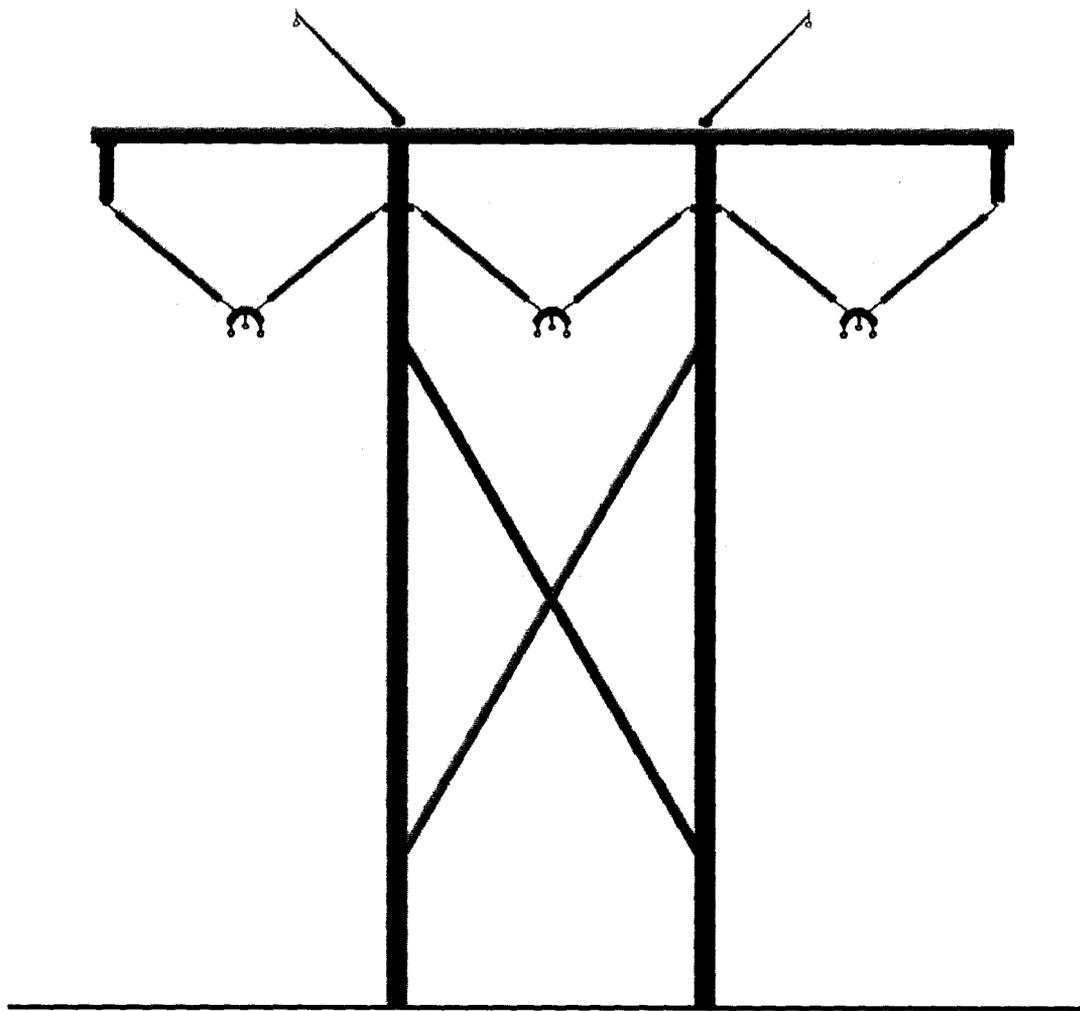


Exhibit G-5

Modified 500kV Single Circuit Steel H-Frame Structure

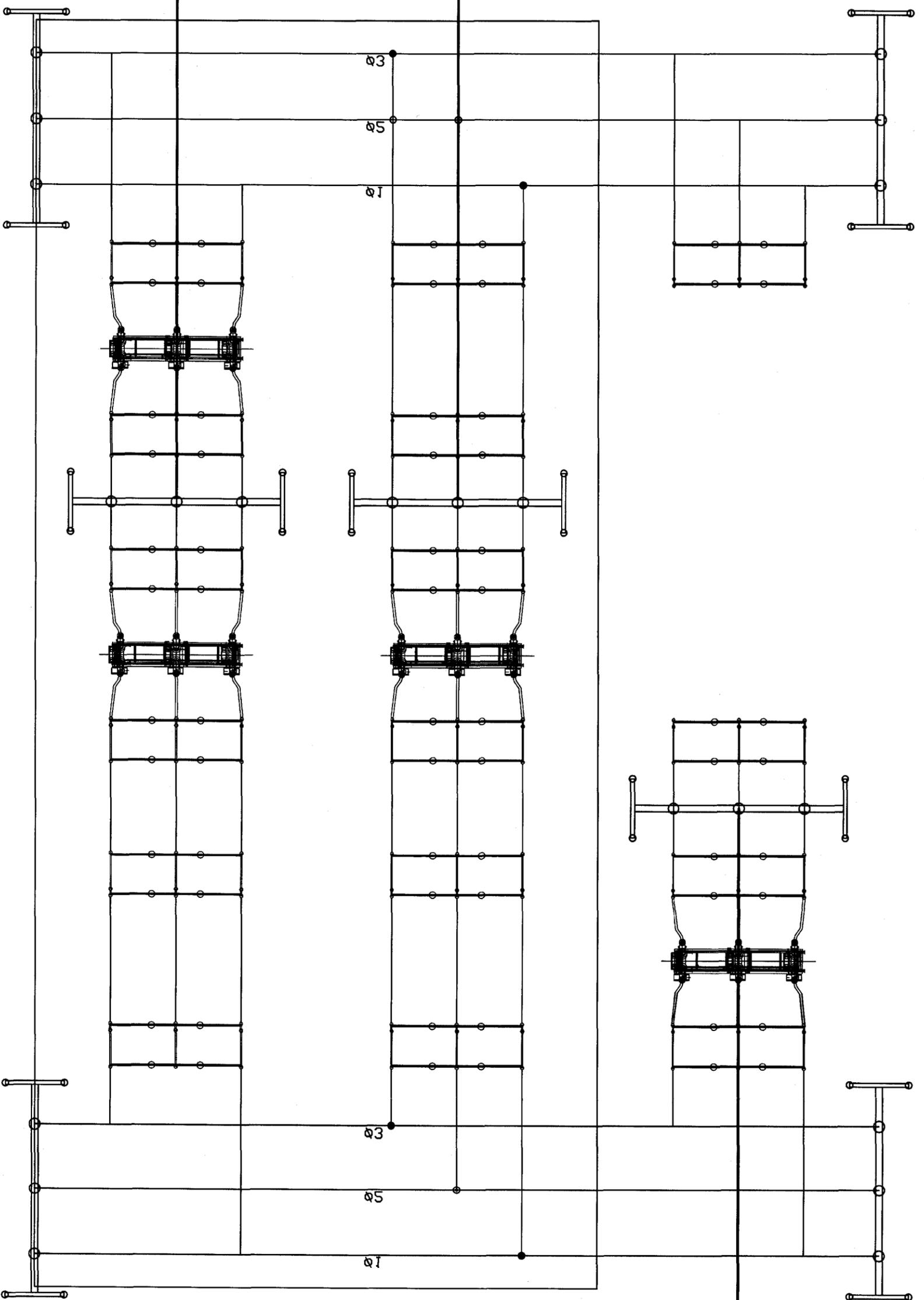
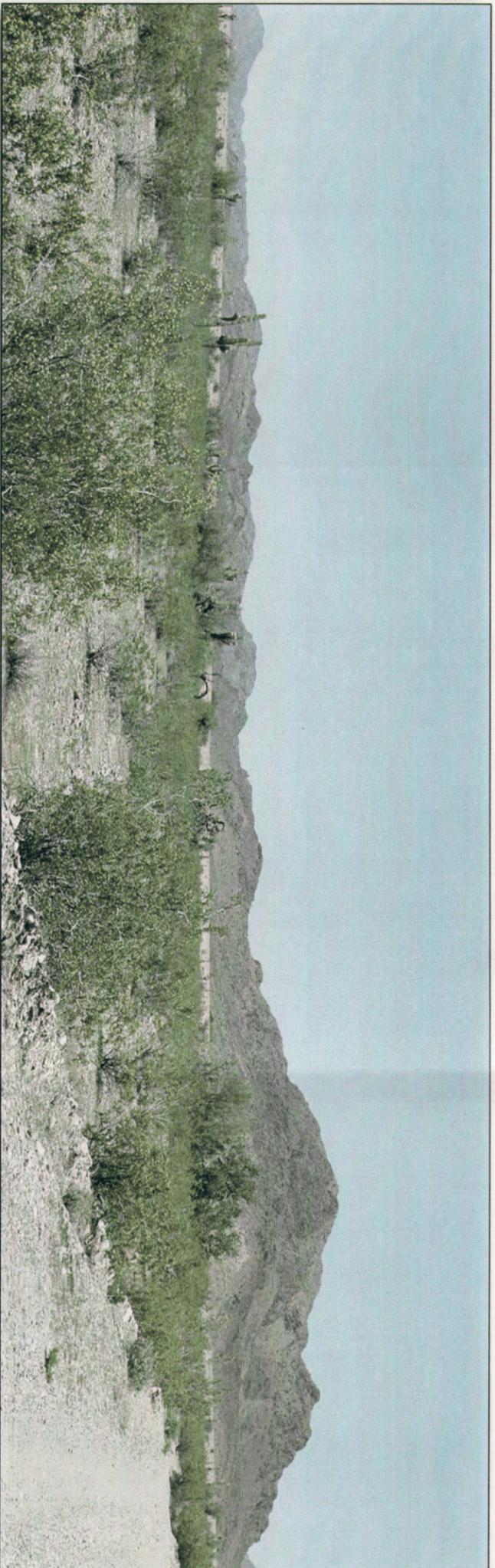
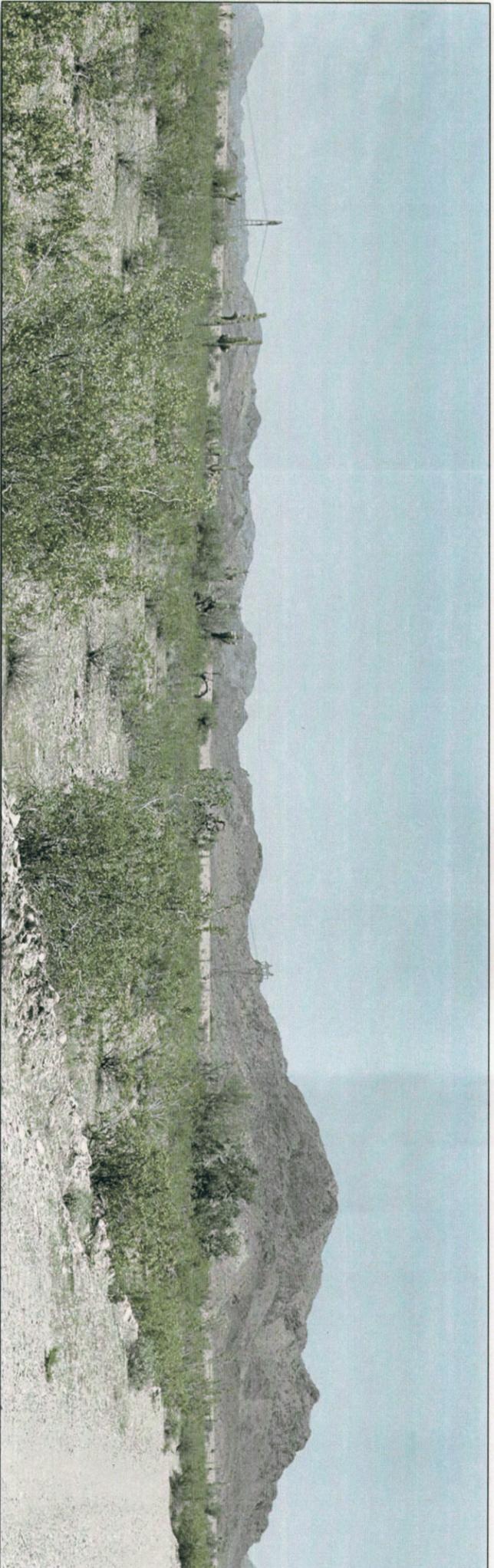


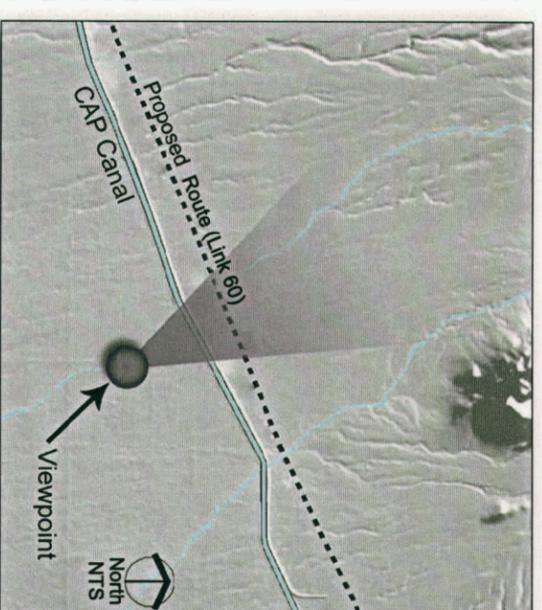
Exhibit G-6  
 Typical 500kV Switchyard Arrangement  
 Scale: 1" = 40'



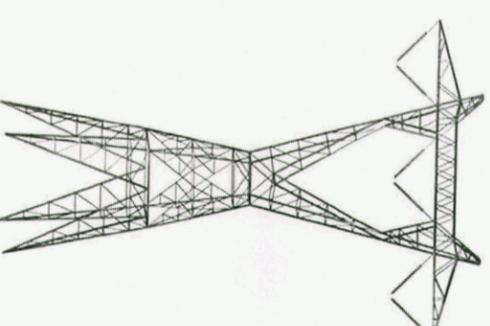
**Existing Conditions - View looking north towards CAP Canal berm and the Belmont Mountains.**  
 Photograph taken 8/15/04 at 12:27 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP Canal (Link 60) within a BLM-designated utility corridor.**



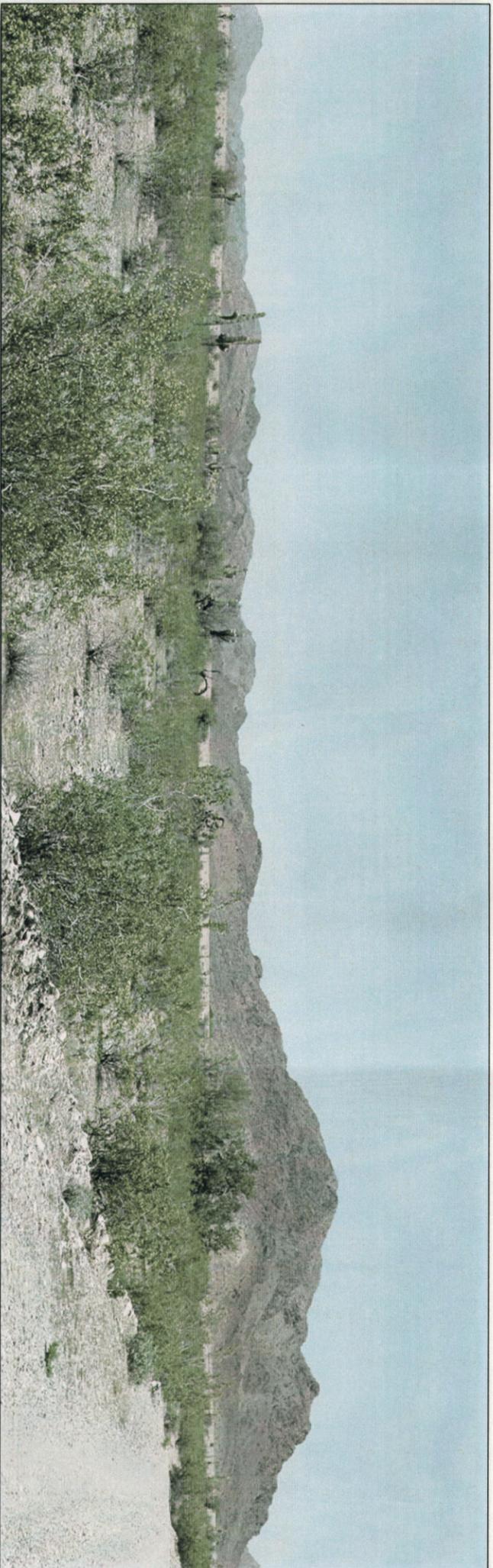
Viewpoint located adjacent to a residence approximately 3,300 feet south of the Proposed Route (Link 60).



Typical 500kV single-circuit 135' steel lattice tower used in simulations

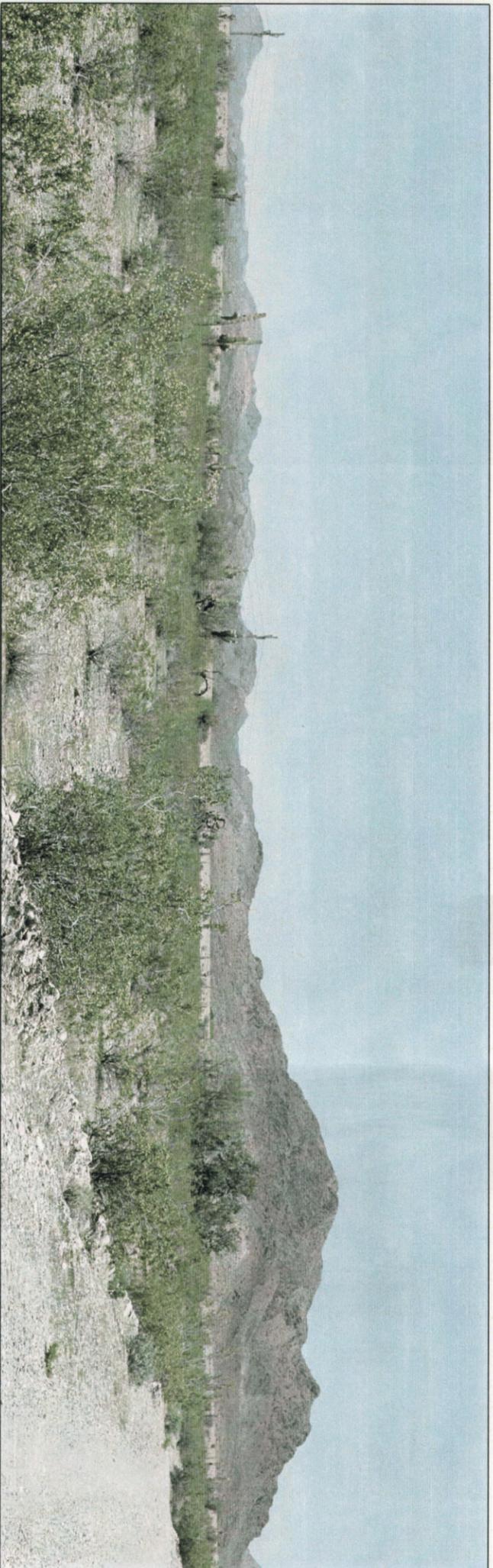
**Palo Verde Hub to TS-5  
 500kV Transmission Project**



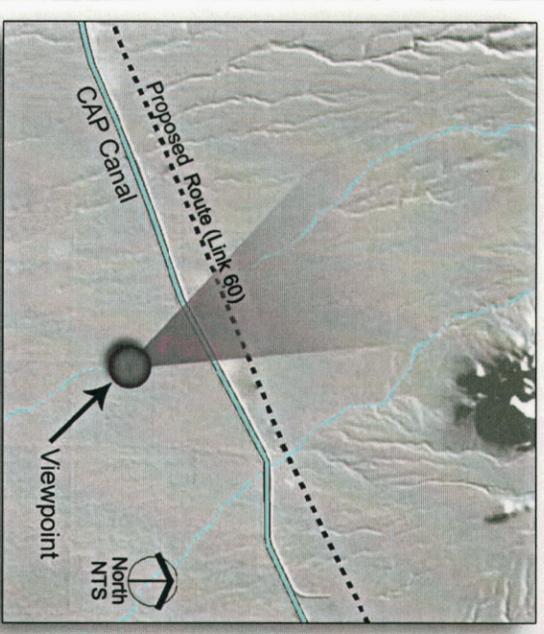


**Existing Conditions - View looking north towards CAP Canal berm and the Belmont Mountains.**

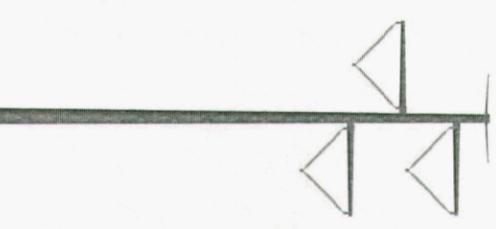
Photograph taken 8/15/04 at 12:27 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel monopole transmission line north of the CAP Canal (Link 60) within a BLM-designated utility corridor.**



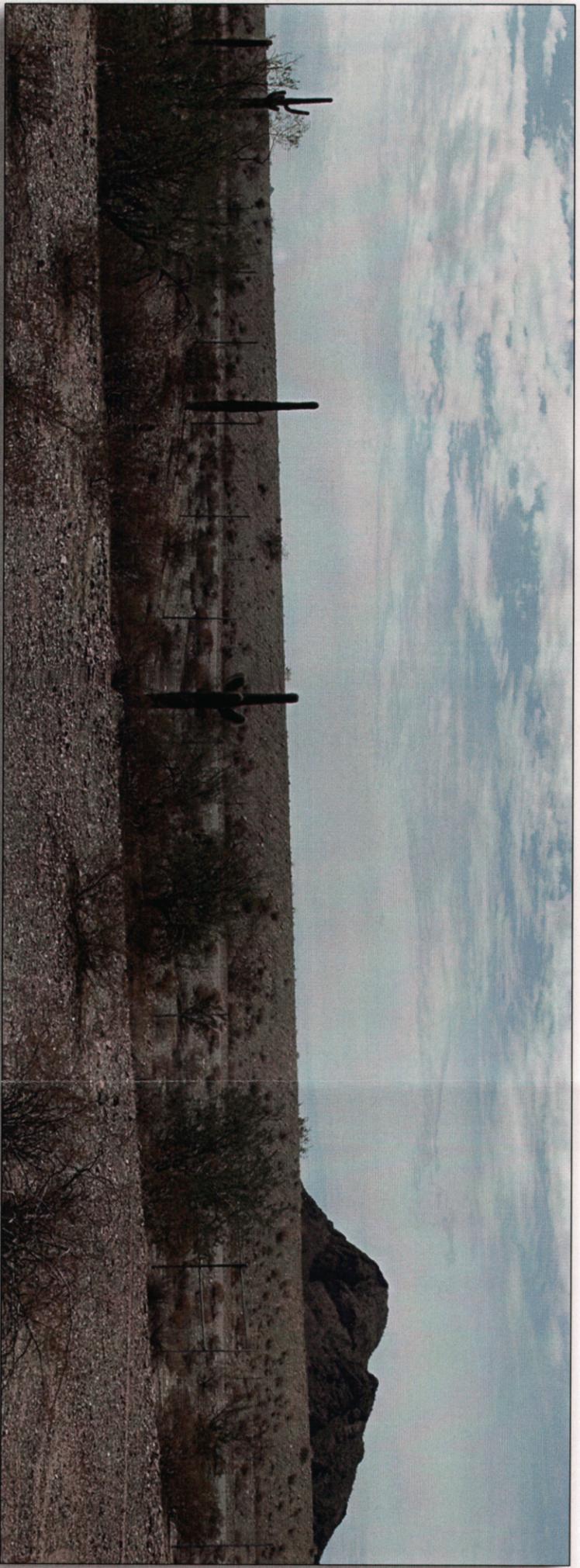
Viewpoint located adjacent to a residence approximately 3,300 feet south of the Proposed Route (Link 60).



Typical 500kV single-circuit 135' steel mono pole used in simulations

**Palo Verde Hub to TS-5  
500kV Transmission Project**

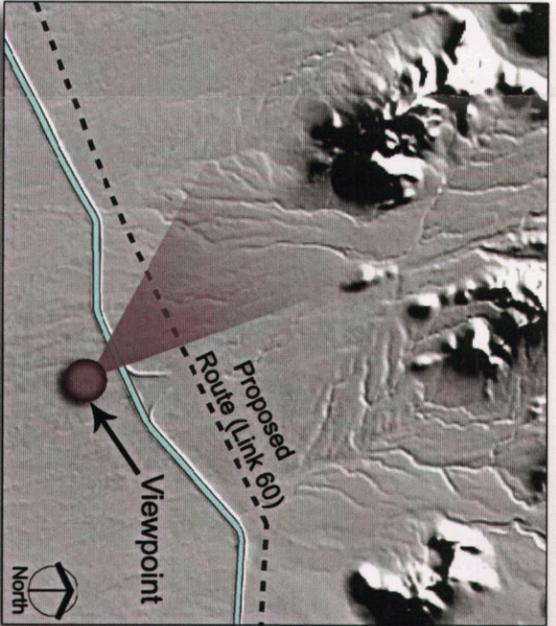




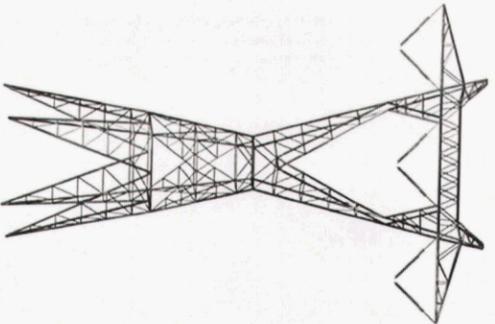
**Existing Conditions** - View looking north-northwest towards CAP Canal berm and the Belmont Mountains.  
 Photograph taken 8/19/04 at 2:28 p.m. using a 50mm focal length.



**Simulation** - Proposed 500kV single-circuit steel lattice tower transmission line (Link 60).



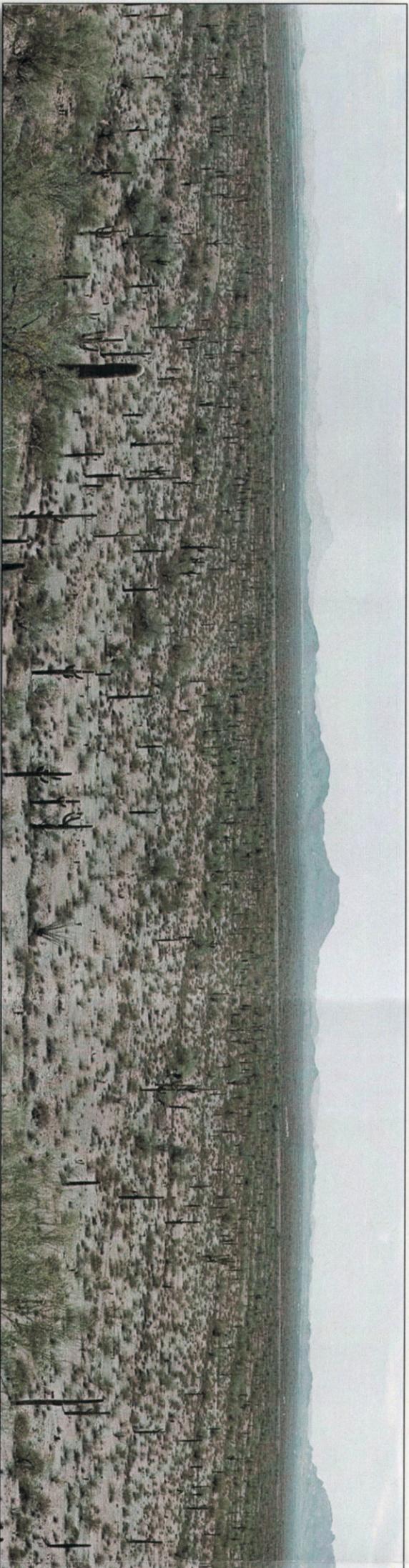
Viewpoint located adjacent to a residence approximately 2,350 feet south of Proposed Route (Link 60).



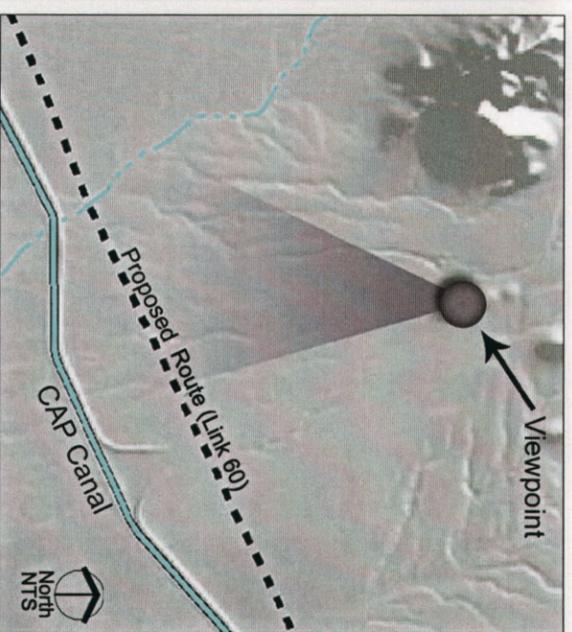
Typical 500kV single-circuit 135' steel lattice tower used in simulations

**Palo Verde Hub to TS5  
 500kV Transmission Project**

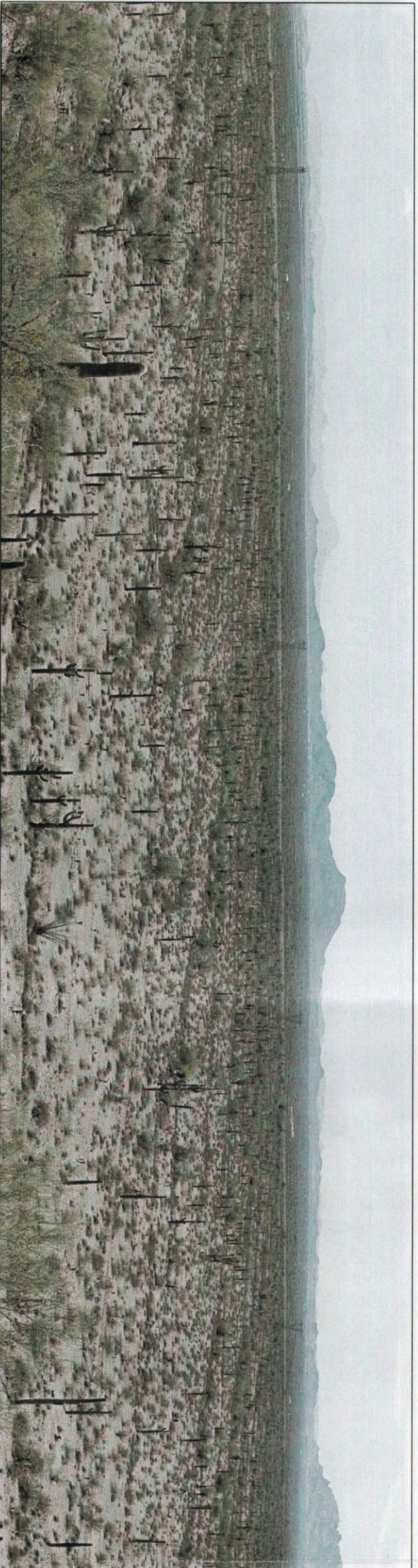




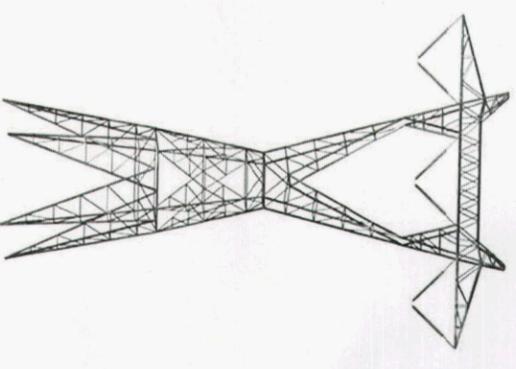
**Existing Conditions - View looking south towards the CAP Canal in the desert plains with the Palo Verde Hills in the background.**  
 Photograph taken 8/15/04 at 2:15 p.m. using a 50mm focal length.



Viewpoint located approximately 5,400 feet north of the Proposed Route (Link 60).



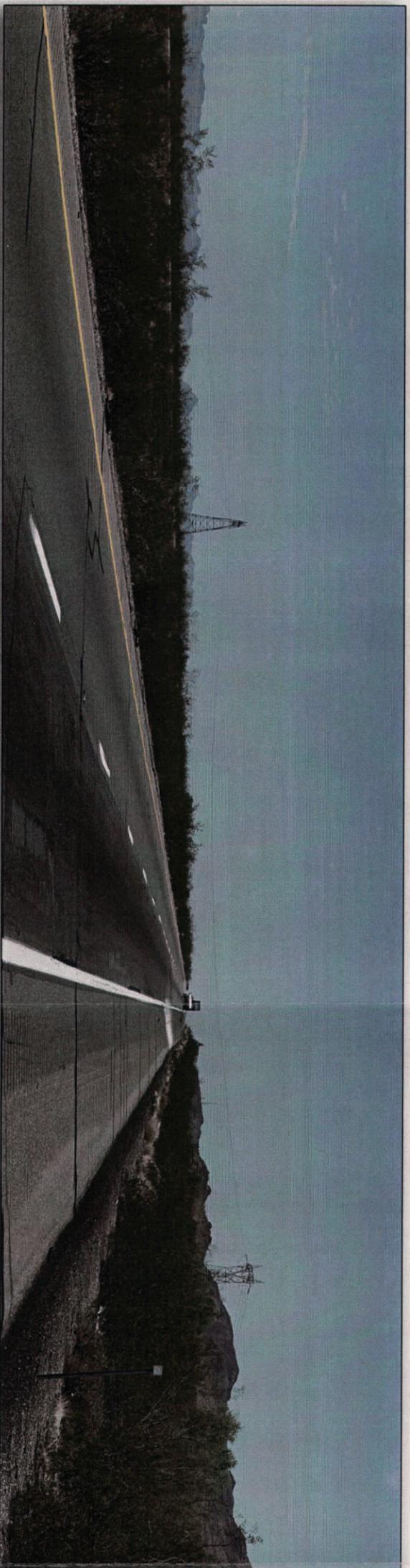
**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP Canal (Link 60) within a BLM-designated utility corridor.**



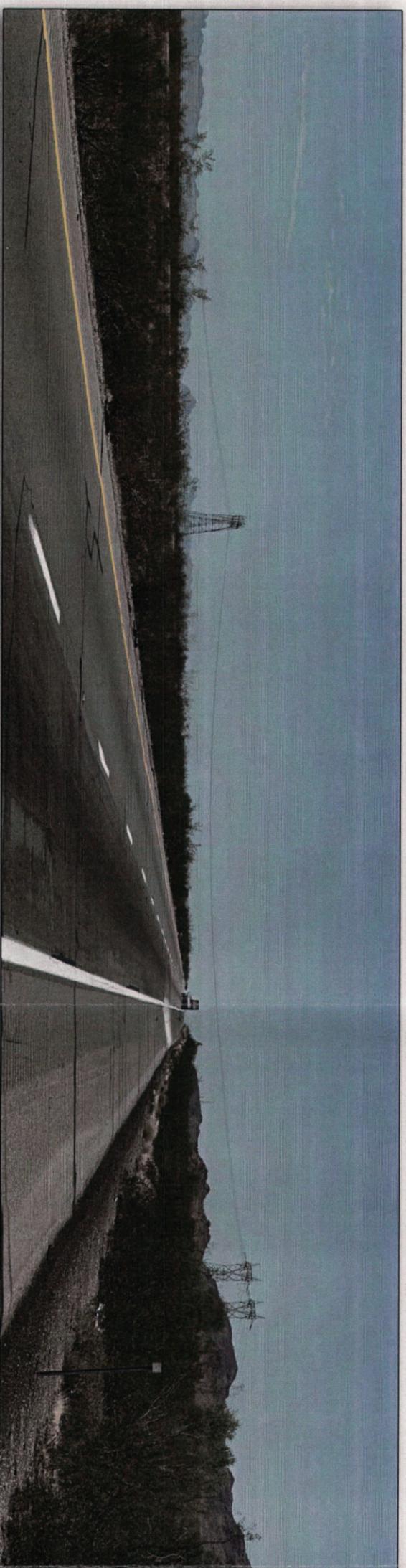
Typical 500kV single-circuit 135' steel lattice tower used in simulations

**Palo Verde Hub to TS-5  
 500kV Transmission Project**

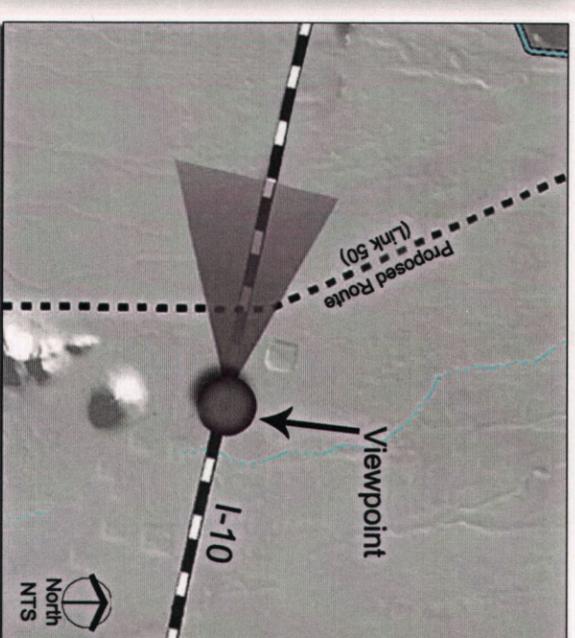




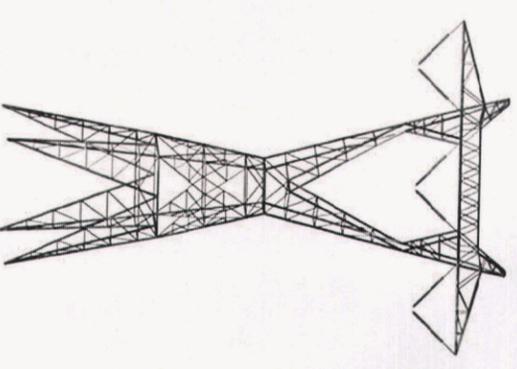
**Existing Conditions - View looking west towards the existing 500kV transmission line crossing Interstate 10.**  
 Photograph taken 7/26/04 at 12:26 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line paralleling east of the existing 500kV transmission line**  
 (Link 50).



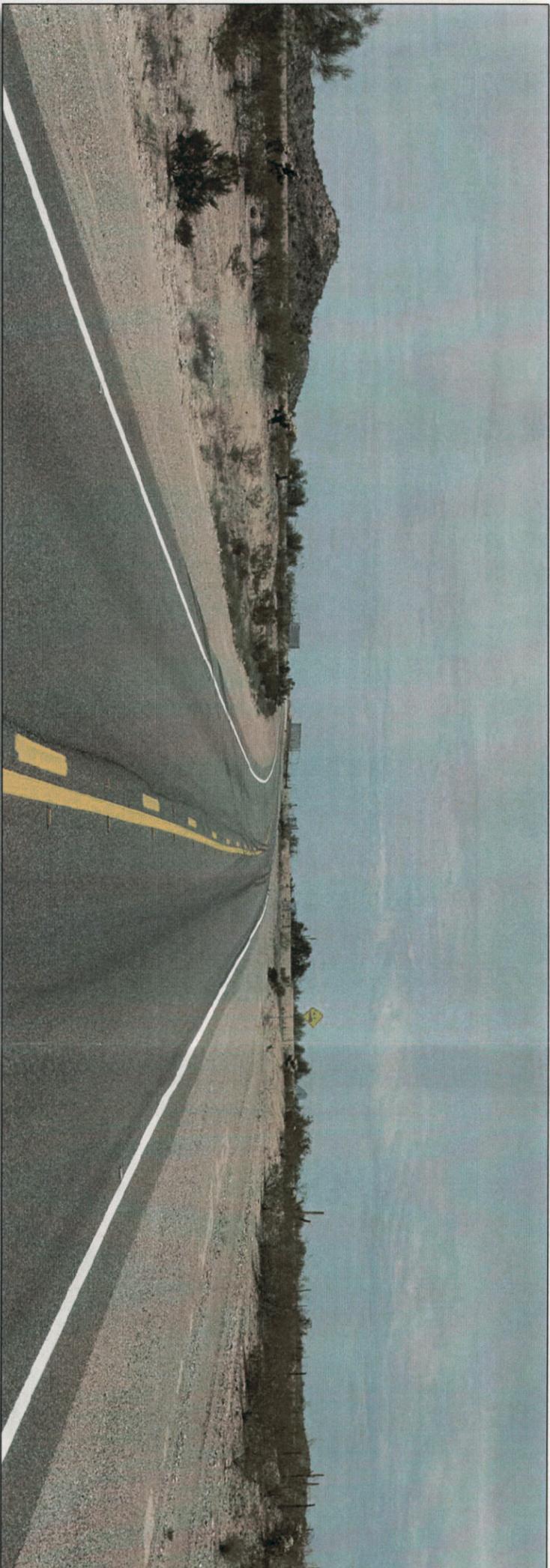
Viewpoint located approximately 3,200 feet east of Proposed Route along westbound Interstate 10 (Link 50).



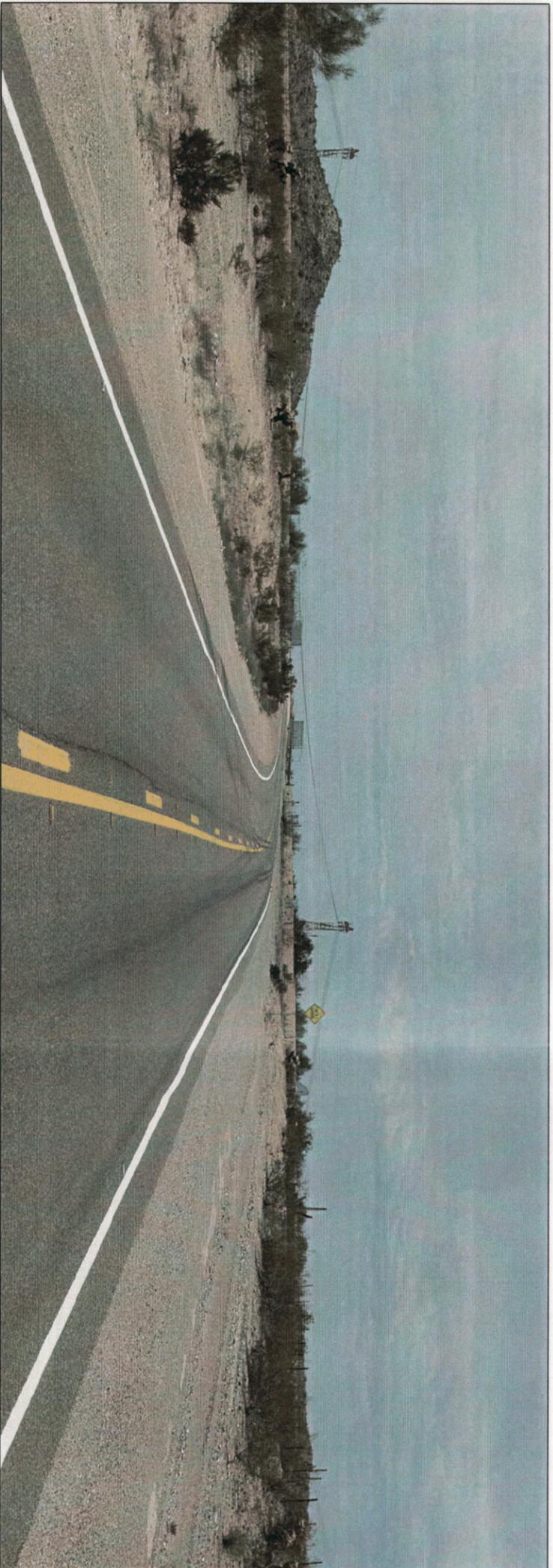
Typical 500kV single-circuit steel lattice tower simulated to match existing tower heights and spans

**Palo Verde Hub to TS-5  
 500kV Transmission Project**

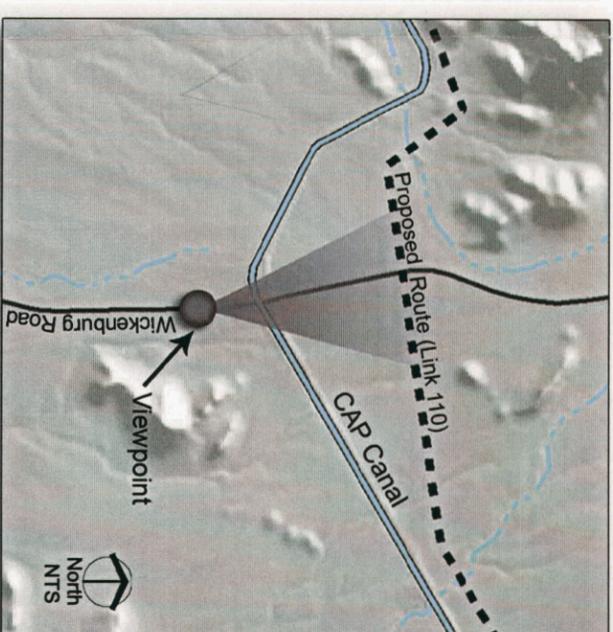




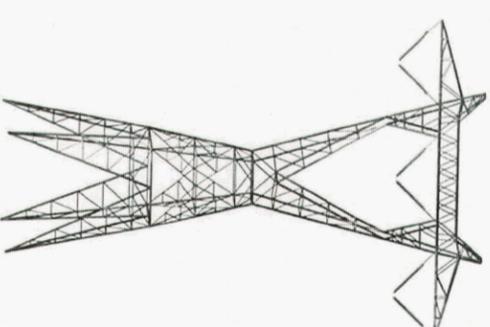
**Existing Conditions - View looking north on Wickenburg Road towards CAP Canal.**  
 Photograph taken 8/4/04 at 11:41 a.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line crossing Wickenburg Road north of the CAP Canal within a BLM-designated utility corridor (Link 110).**



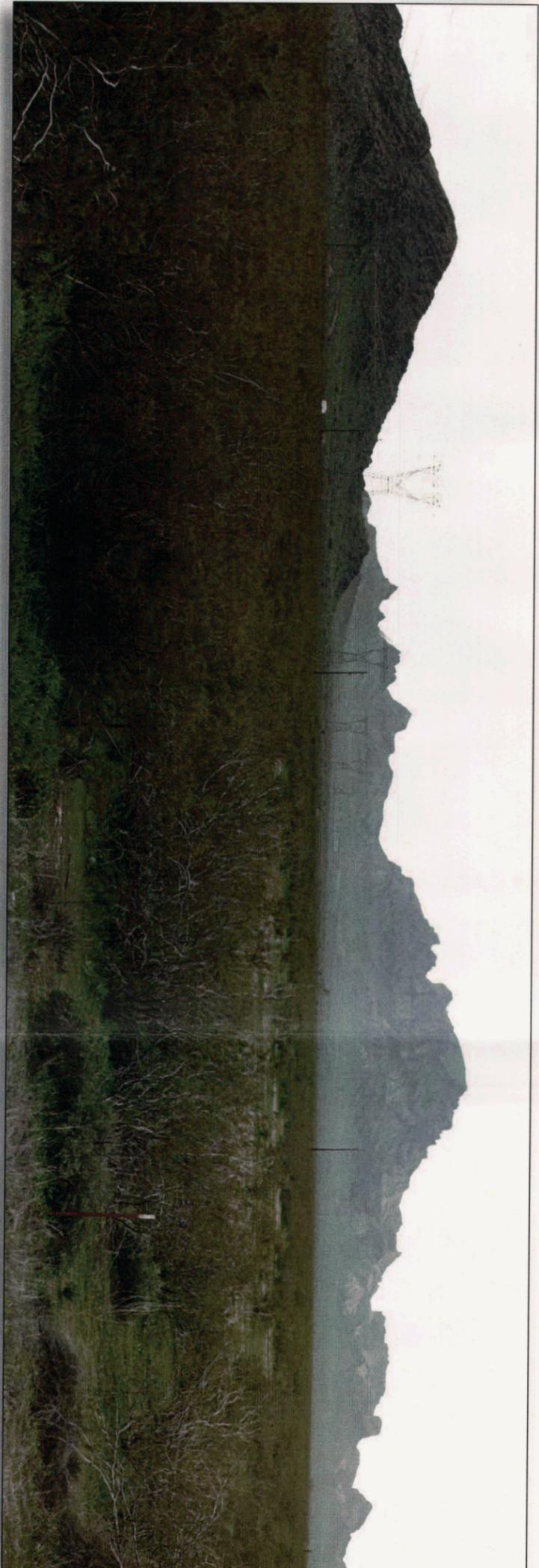
Viewpoint located approximately 4,000 feet south of the Proposed Route along northbound Wickenburg Road (Link 110).



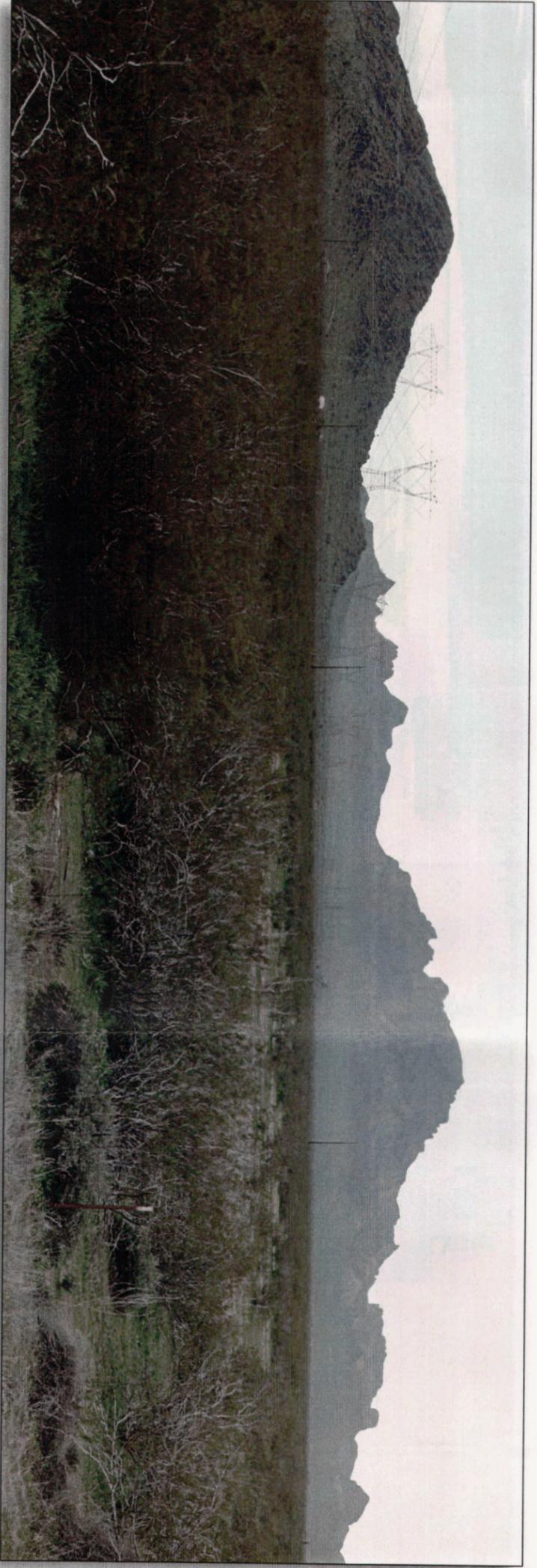
Typical 500kV single-circuit 135' steel lattice tower used in simulations

**Palo Verde Hub to TS-5  
 500kV Transmission Project**

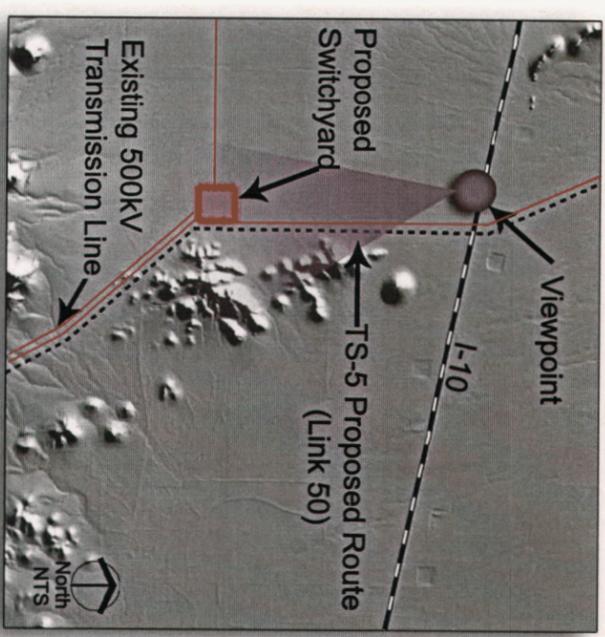




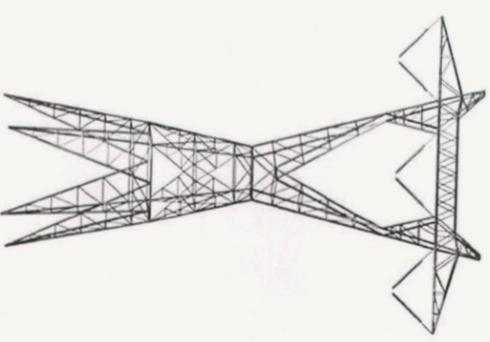
**Existing Conditions - View looking south on Interstate 10 towards Saddle Mountain.**  
 Photograph taken 1/11/05 at 1:17 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line connecting into the proposed Harquahala Junction Switchyard (Link 50).**



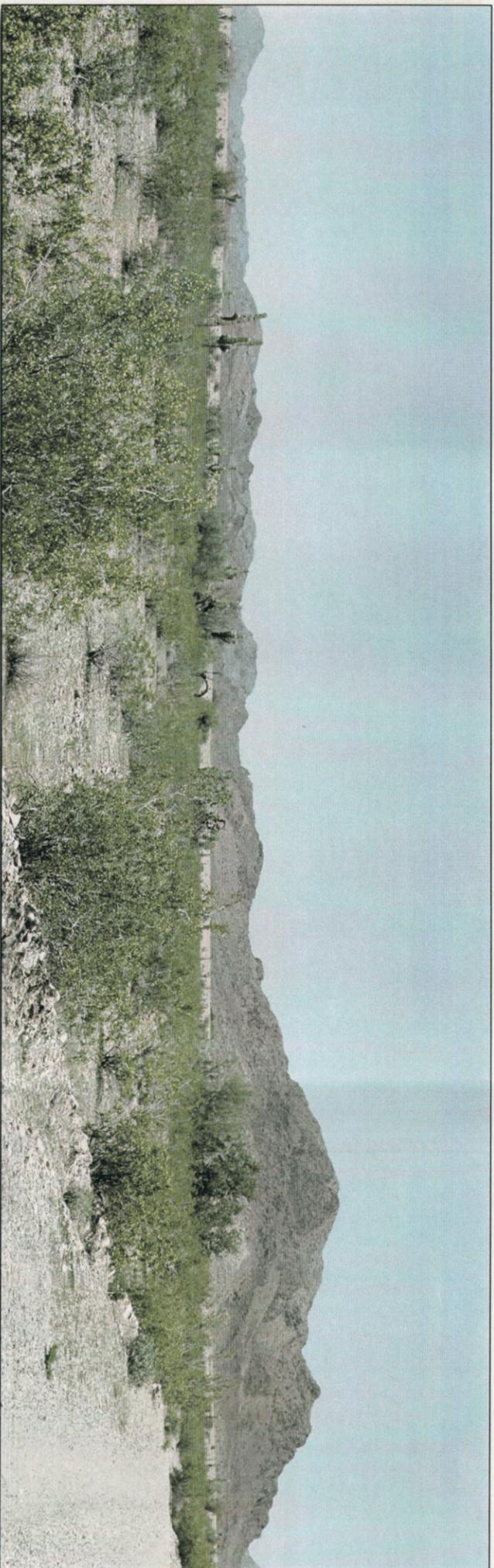
**Viewpoint located approximately 2.5 miles north of the proposed Harquahala Junction Switchyard along eastbound Interstate 10 (Link 50).**



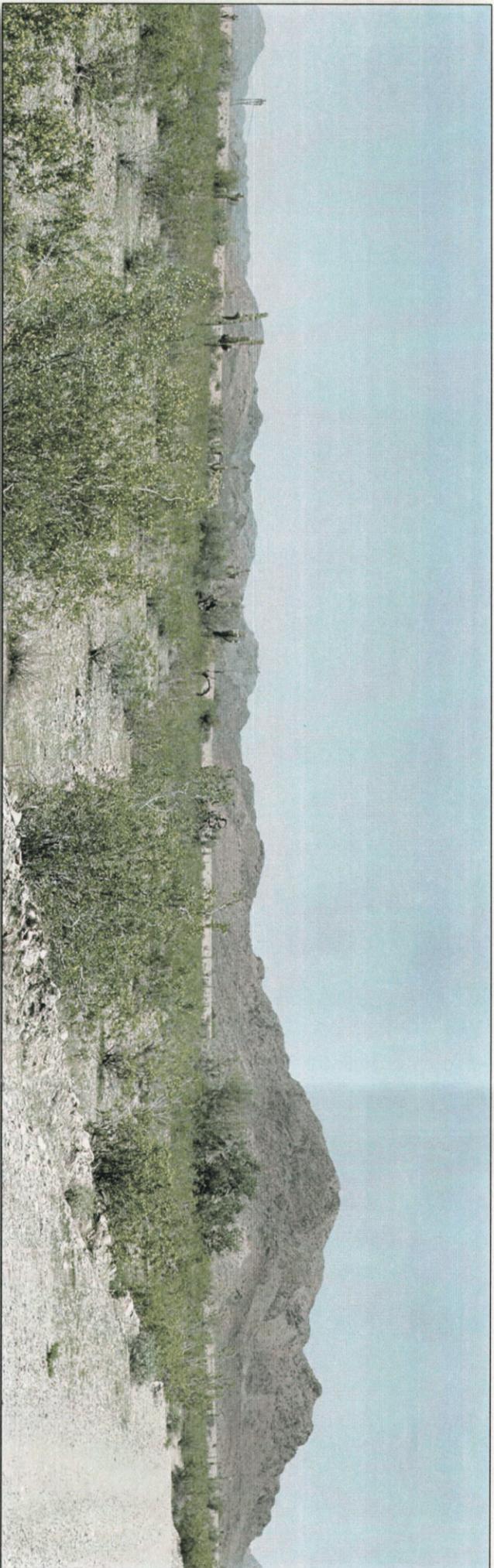
**Typical 500kV single-circuit steel lattice tower simulated to match existing tower heights and spans**

**Palo Verde Hub to TS-5  
 500kV Transmission Project**

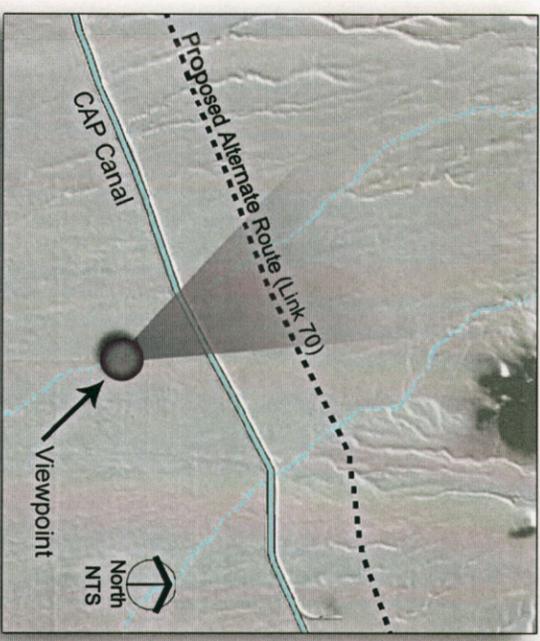




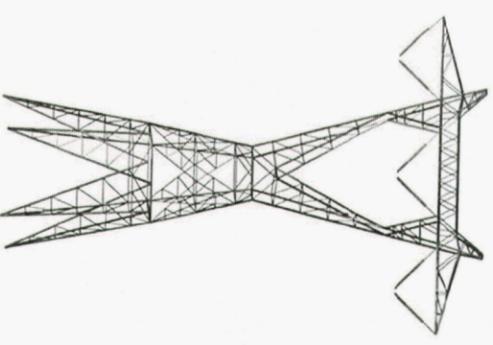
**Existing Conditions - View looking north towards CAP Canal and the Belmont Mountains.**  
 Photograph taken 8/15/04 at 12:27 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP Canal (Link 70) within a BLM-designated utility corridor.**



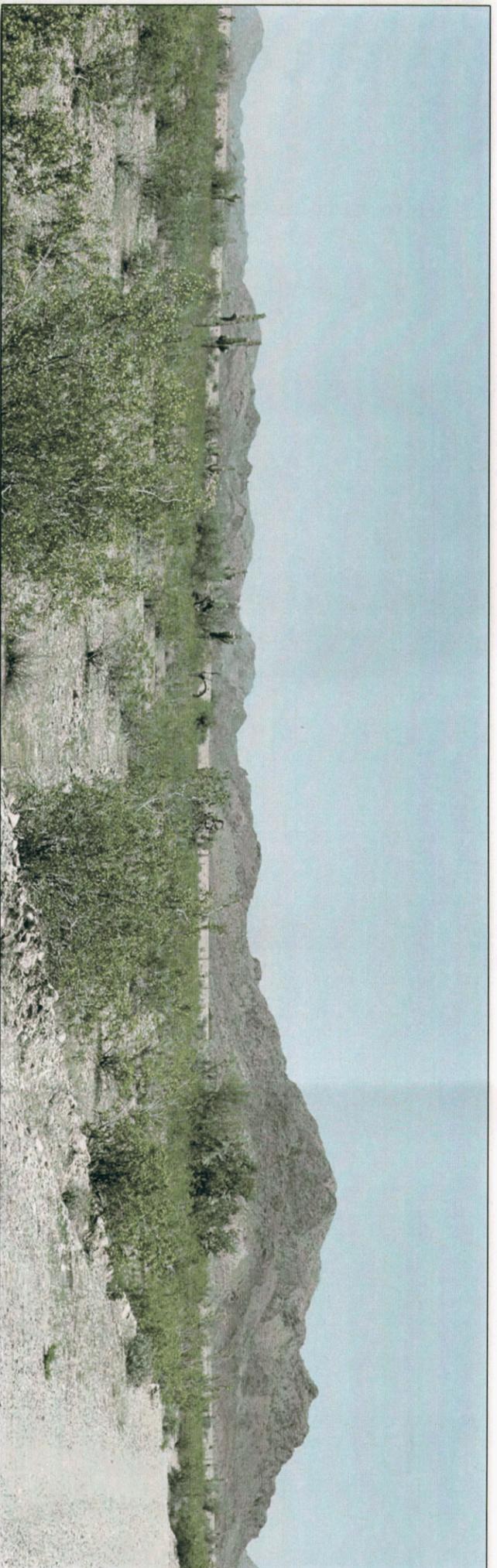
Viewpoint located adjacent to a residence approximately 4,500 feet south of the Proposed Alternate Route (Link 70).



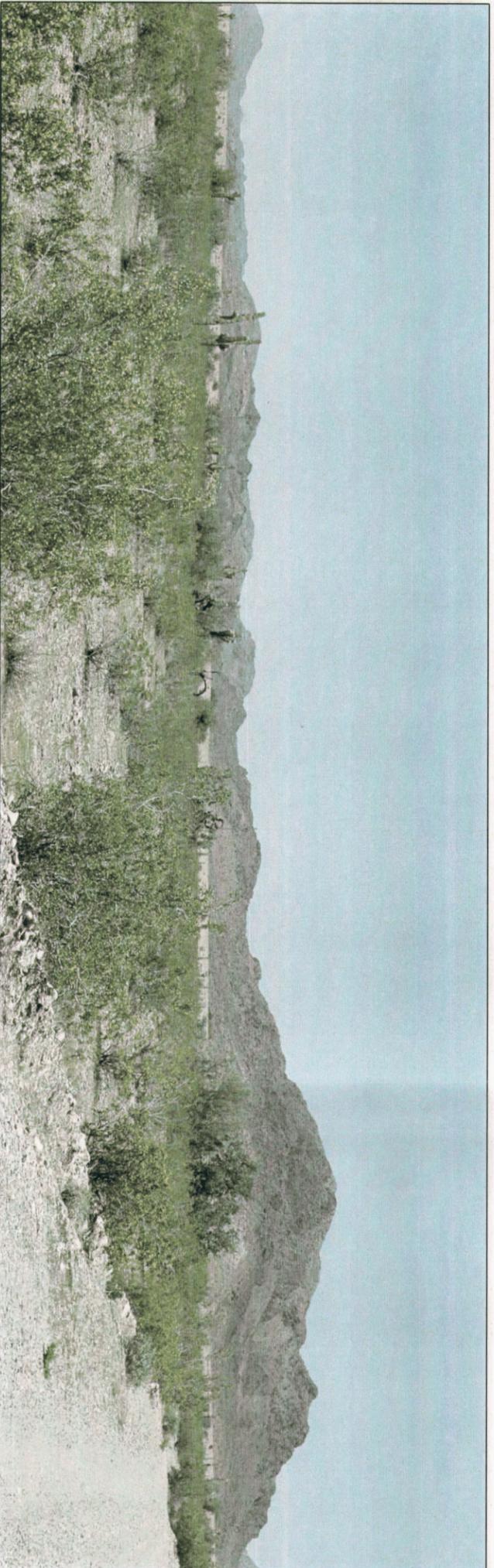
Typical 500kV single-circuit 135' steel lattice tower used in simulations

**Palo Verde Hub to TS-5  
 500kV Transmission Project**

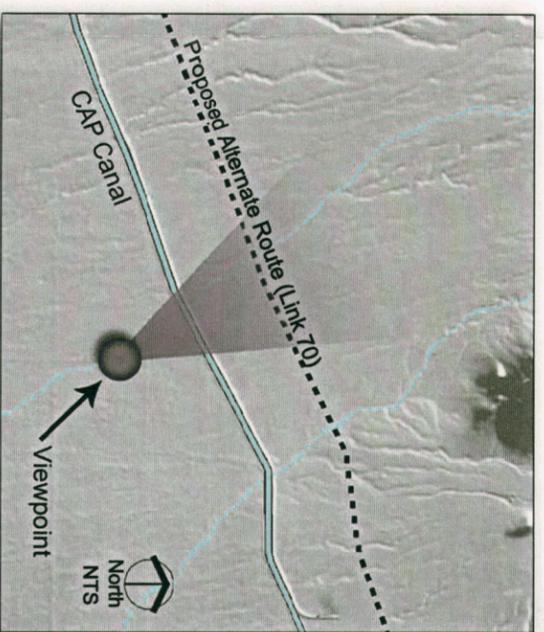




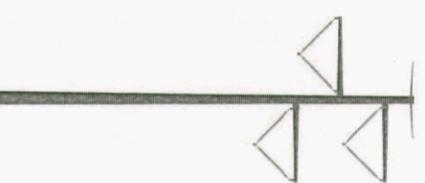
**Existing Conditions - View looking north towards CAP Canal and the Belmont Mountains.**  
 Photograph taken 8/15/04 at 12:27 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel monopole transmission line north of the CAP Canal (Link 70) within a BLM-designated utility corridor.**



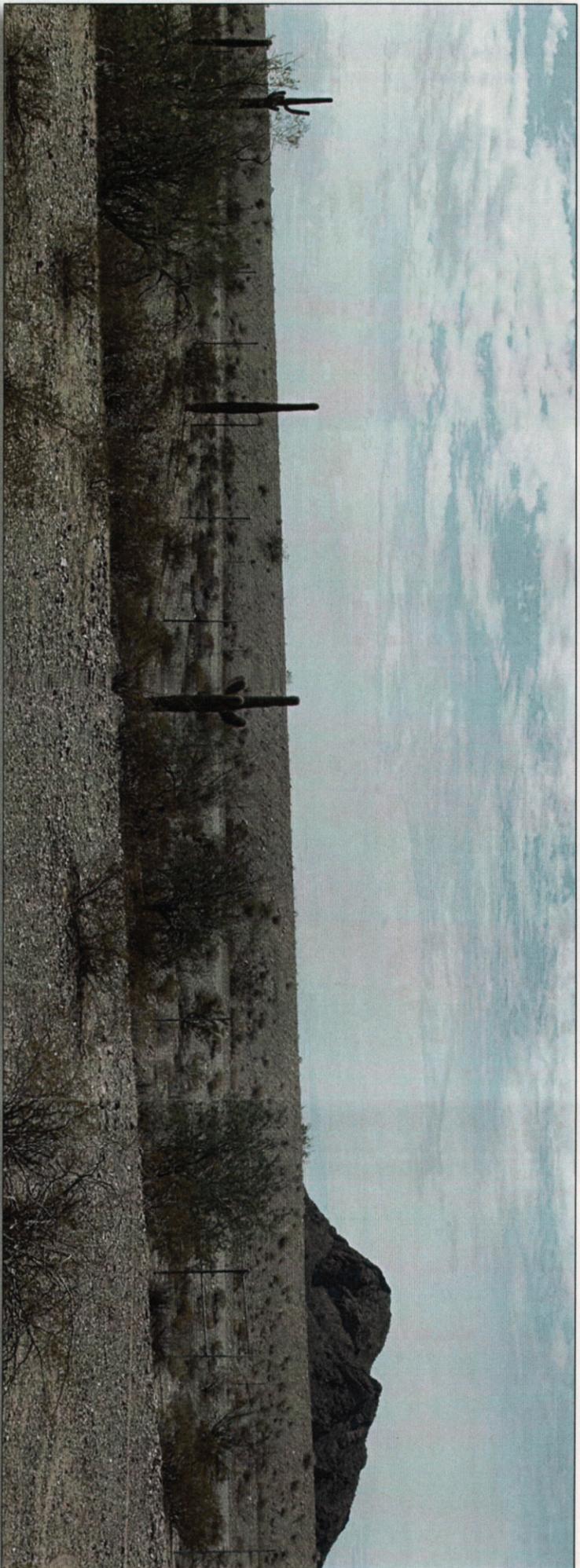
Viewpoint located adjacent to a residence approximately 4,500 feet south of the Proposed Alternate Route (Link 70).



Typical 500kV single-circuit 135' steel monopole used in simulations

**Palo Verde Hub to TS-5  
 500kV Transmission Project**

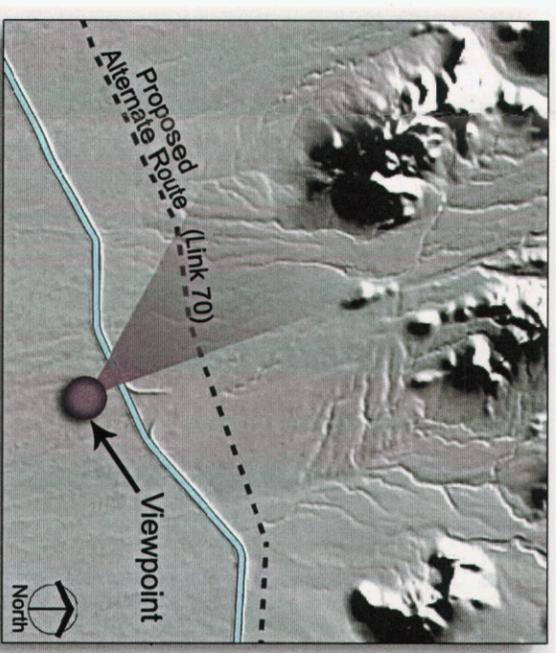




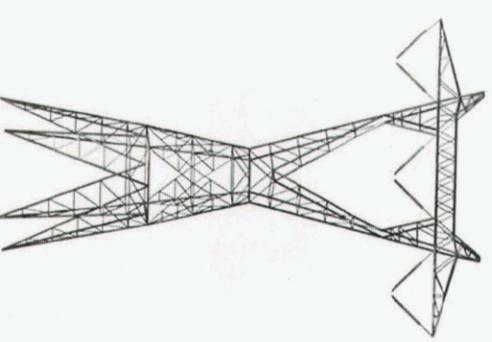
**Existing Conditions - View looking north-northwest towards CAP Canal berm and the Belmont Mountains.**  
 Photograph taken 8/19/04 at 2:28 p.m. using a 50mm focal length.



**Simulation - Proposed 500kV single-circuit steel lattice tower transmission line (Link 70).**



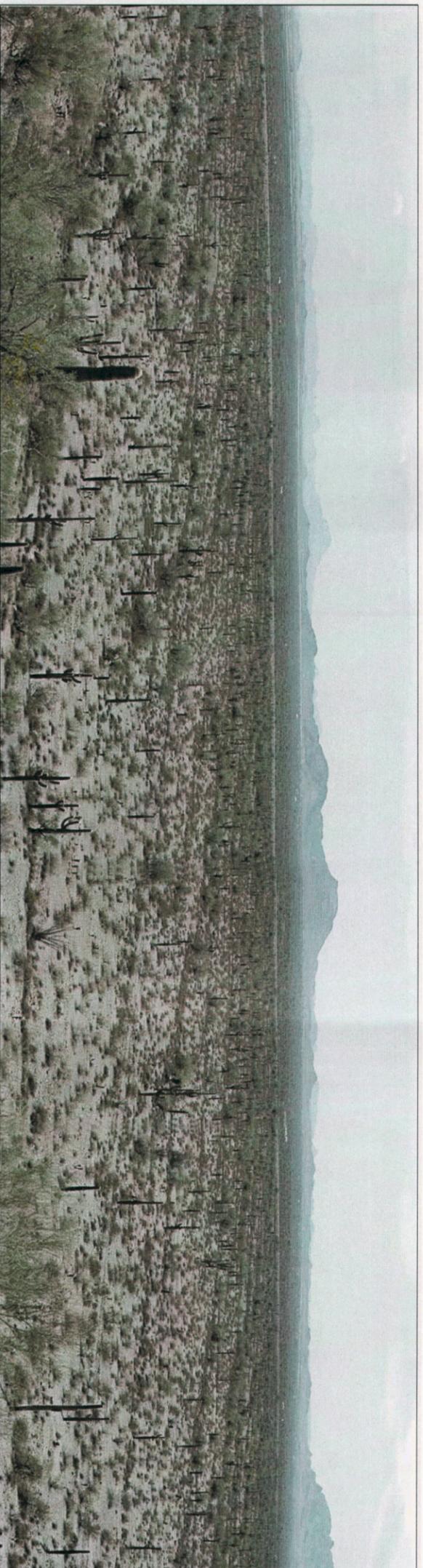
Viewpoint located adjacent to a residence approximately 2,950 feet south of Proposed Alternate Route (Link 70).



Typical 500kV single-circuit 135' steel lattice tower used in simulations

Palo Verde Hub to TS5  
 500kV Transmission Project

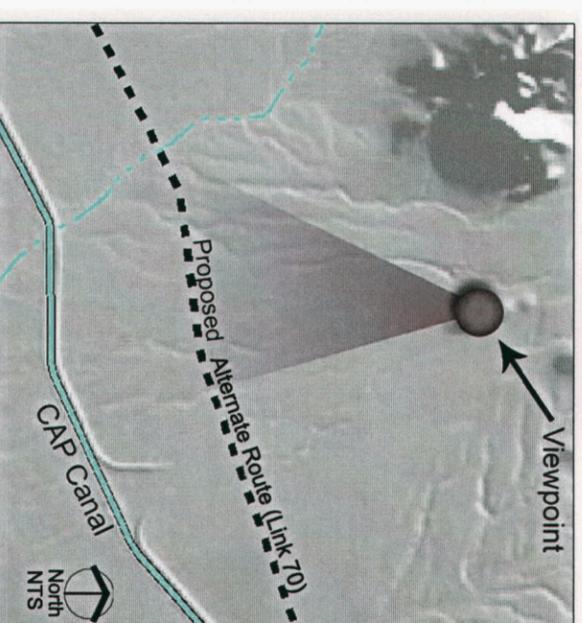




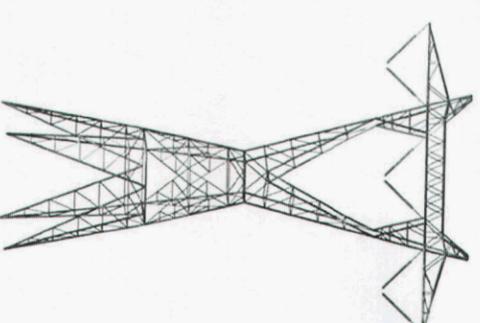
Existing Conditions - View looking south towards the CAP Canal in the desert plains with the Palo Verde Hills in the background.  
 Photograph taken 8/15/04 at 2:15 p.m. using a 50mm focal length.



Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP Canal (Link 70) within a BLM-designated utility corridor.



Viewpoint located approximately 4,800 feet north of the Proposed Alternate Route (Link 70).



Typical 500kV single-circuit 135' steel lattice tower used in simulations

**Palo Verde Hub to TS-5  
 500kV Transmission Project**



# EXHIBIT H

**EXHIBIT H**  
**EXISTING PLANS**

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## EXHIBIT H EXISTING PLANS

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As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“To the extent applicant is able to determine, state the existing plan of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route.”*

Existing and planned land uses are mapped in Exhibits A-3 and A-4, respectively, and discussed in Exhibit B. For further information refer to the EA, provided under separate cover as Exhibit B-1.

### AGENCY AND PUBLIC COORDINATION

A public contact program was conducted throughout the life of the project to provide information to and receive input from federal, state, and local government agencies, as well as private entities. Representatives from various planning departments also were asked to provide their review and comment of the existing and future land use maps to ensure consistency with current planning documents and to identify potential issues associated with the siting of the proposed 500kV transmission line north of the CAP Canal. Details regarding the project public involvement process, as well as a summary of public contact letters, and public response letters, are located in Exhibit J. Additionally, public notices and the project fact sheet are located in Exhibit J.

As part of the land use study for the project, general and specific plans were gathered from federal, state, and local jurisdictions as well as private developers in the study area. Project meetings and presentations were held with representatives of these entities throughout the planning process to gather information about planned development and potential issues. Initial federal agency coordination commenced in December 2003 when the Applicant met with BLM representatives to initiate the development of the EA. Subsequent meetings with the BLM Project Manager and resource representatives were held throughout the EA development. The Applicant also met with representatives of the BOR and CAWCD throughout the planning process to coordinate issues associated with placing proposed facilities on BOR rights-of-way.

The Applicant held a series of meetings with State and County representatives throughout the planning process. Meetings were held with ASLD Minerals Department representatives to coordinate the Applicant's right-of-way terms associated with a pending mineral lease north of the CAP Canal. Maricopa County officials also were briefed regarding the proposed project. The Applicant presented the proposed project to the Maricopa County Trails Commission and conducted a series of meetings with three Maricopa County Supervisors during the planning process. Additionally, the project team met with representatives of the planning departments from the Town of Buckeye and Maricopa County (as described in Exhibit J).

## REFERENCES

References from which the consultant received information regarding the various jurisdictional plans consist of the following:

Arizona Game and Fish Department, *Boundaries of Arizona Game and Fish Wildlife Areas*. 1999

Maricopa County Trail Commission, *Maricopa County Regional Trail System Plan*, 2004.

Maricopa County, *Maricopa County Comprehensive Plan - 2020 Eye to the Future*, 2002.

Maricopa County, *Tonopah/Arlington Area Plan*, 2000.

United States Department of the Interior - Bureau of Land Management, *Land and Mineral Records LR2000*. 2004.

United States Department of the Interior - Bureau of Land Management, *Final Amendment and Environmental Assessment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan*. 2000.

\_\_\_\_\_. *Decisions from the Lower Gila North Management Framework Plan Step III etc.*, 1994.

\_\_\_\_\_, *Final Lower Gila South Resource Management Plan and Environmental Impact Statement*. 1985.

\_\_\_\_\_. *Lower Gila North Management Framework Plan – Step I*. 1981.

Town of Buckeye, *General Development Plan*, 2001

Arizona Public Service - West Valley North Certificate of Environmental Compatibility. 2004.

# EXHIBIT I

**EXHIBIT I**  
**ANTICIPATED NOISE AND INTERFERENCE**  
**WITH COMMUNICATION SIGNALS**

---

# EXHIBIT I

## ANTICIPATED NOISE AND INTERFERENCE WITH COMMUNICATION SIGNALS

---

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities.”*

Certain electromagnetic effects are inherently associated with overhead transmission of electrical power at extra high voltage. These effects are produced by the electric and magnetic fields of the transmission line with one of the primary effects being corona discharge. Corona effects are manifest as audible noise, radio interference, and television interference. These particular effects will be minimized by line location, line design, and construction practices. Results presented in this exhibit are based on consideration of the various possible construction configurations along the line route. Five different line configurations were considered along the length of the line route.

### **CORONA**

Corona is a luminous discharge due to ionization of the air surrounding a conductor and is caused by a voltage gradient, which exceeds the breakdown strength of air. Corona is a function of the voltage gradient at the conductor surface. This voltage gradient is controlled by engineering design and is a function of voltage, phase spacing, height of conductors above ground, phase geometry, and meteorological conditions. In particular, irregularities on the surface of the conductor such as nicks, scratches, contamination, insects, and water droplets increase the amount of corona discharge. Consequently, during periods of rain and foul weather, corona discharges increase. For the various transmission designs considered for this project, the average calculated voltage gradient at the conductor surface was 14.3kV route mean square (rms)/centimeter (cm). The maximum calculated voltage gradient at the conductor surface is 16.45kV rms/cm. For comparison purposes, the breakdown strength of air is 21.1kV rms/cm at 25°C and 76 millimeter (mm) barometric pressure.

Corona represents power loss on the transmission line and creates transmission line noise. Successful operation of 500kV lines with similar gradients indicates that this transmission line will not create adverse corona effects.

### **Audible Noise**

Audible noise is created by corona discharge along the transmission line. As a result, the amount of audible noise is directly related to the amount of corona, which is in turn affected by

meteorological conditions (most notably rain). Transmission line audible noise is categorized into broadband high frequency sounds, which can be described as hissing or sputtering, and low frequency tones, which are best described as humming sounds.

The highest calculated audible noise levels for the transmission line design during foul weather (rain) may reach 48.7 decibels measured on an "A" weighted (dBA) scale at the edge of the right-of-way. This noise level will occur during heavy rain, which will serve to mask the noise. During fair weather the audible noise at the edge of the right-of-way is significantly reduced with a maximum value of 37.5 dBA. For the various configurations studied, the average foul weather audible noise is 39.4 dBA and the average fair weather noise is 27.1 dBA.

Historical measurements along transmission corridors of similar makeup (open desert) have shown normal ambient audible noise levels in the range of 43 to 52 dBA with an average value of 50 dBA. Due to the expected low audible noise levels, the line noise will normally be inaudible at the edge of the right-of-way during fair weather. Considering the relatively few hours of audible noise producing weather, the location of the line with respect to neighboring land uses, and calculated audible noise levels during foul weather, no serious audible noise problems are expected even during foul weather.

### **Radio Interference**

Radio interference is the reception of spurious energy not generated by the transmitting station. This energy affects the amplitude modulated radio band, but not the frequency modulated radio band. Transmission line radio interference is caused by corona and by gap discharges. Gap discharges are electrical discharges across a small gap with the most common cause being loose hardware. Gap discharges comprise a large percentage of all interference problems and are easily remedied. Experience shows that gap discharges are not a problem with steel structures, but are more prevalent with wood structures due to the expansion and contraction of the wood causing hardware to loosen.

Corona-caused radio interference impact is dependent on various factors including distance from the line to the receiver, radio signal strength, ambient radio noise level, receiving antenna orientation, and weather conditions. A common practice of determining the expected level of radio interference is to calculate and plot a lateral profile of the transmission line radio interference at a frequency of 1 megahertz (MHz). In addition, a frequency spectrum plot of radio interference can be used to see how the radio interference varies at a particular location through the frequency spectrum.

Comparison of the calculated radio noise levels for the transmission line design shows fair weather radio noise levels in the range of 34.3 decibel (dB) (above 1 microvolt [ $\mu$ V]/meter) at a distance of 100 feet from the outside phase. This compares favorably with the maximum recommended noise level of 40 dB, above 1  $\mu$ V/meter. During inclement weather, transmission line noise levels increase to levels in the range of 60 dB, above 1  $\mu$ V/meter 100 meters from the

outside phase. Even though radio reception quality is reduced during periods of rainy weather, the impact is expected to be minimal due to the low frequency of inclement weather. In addition to these comparisons of calculated and recommended interference values, transmission line experience for lines of similar design traversing similar terrain has shown radio interference to be insignificant. Should radio interference caused by the transmission line become unacceptable in a given situation, mitigating techniques can be applied on an as-needed basis between the utility and the complainant.

### **Television Interference**

Traditional television broadcasts occur in three ranges:

- 54 - 88 MHz (Channels 2 - 6)
- 174 - 216 MHz (Channels 7 - 13)
- 470 - 890 MHz (Channels 14 - 83)

Transmission line interference reduces with increasing frequency above 100 MHz. Consequently, television interference only affects the lower VHF band (Channels 2 - 6) and no interference will be experienced in the upper VHF (Channels 7 - 13) and UHF bands (Channels 14 - 83) even during foul weather. Television interference noise levels can potentially affect amplitude modulated signals; therefore, the picture quality, which is amplitude modulated, can be affected, but not the sound quality as these signals are frequency modulated.

Comparison of expected television interference levels at the edge of the right-of-way show levels consistent with values calculated for other 500kV lines which traverse similar terrain. Foul weather television interference at the edge of the right-of-way for a typical span is calculated at 12.9 dB above 1  $\mu$ V/m. Consequently, no transmission line generated television interference is expected along the line, even during periods of inclement weather.

Where transmission line generated television interference has been found to be a problem, it is generally the result of induced voltage on fences, conductors, and hardware, which are adjacent to the right-of-way. In these situations, the interference can be easily corrected by grounding the objects, or by realigning, relocating, or providing higher gain television antennas. The Applicant is prepared to assist affected parties in resolving television interference problems resulting from the operation of the proposed facilities. However, with the increasing popularity of newer technologies such as cable, satellite, and digital television, transmission line television interference problems warranting any sort of corrective action are even more unlikely.

## Switchyard Effects

The audible noise produced by the switchyard equipment for this project is expected to be lower than other 500kV projects since there will not be any transformer noise associated with the switchyard.

Radio and television interference produced by the switchyard are not expected to be any more severe than that indicated for the transmission line. Appropriate corona rings will be used to reduce the amount of corona on the energized equipment and thus minimize any radio or television interference.

# EXHIBIT J

**EXHIBIT J**  
**SPECIAL FACTORS**

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## EXHIBIT J SPECIAL FACTORS

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As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

*“Describe any special factors not previously covered herein, which Applicant believes to be relevant to an informed decision on its application.”*

Exhibit J-1	Project Newsletter
Exhibit J-2	Open House Comment Form
Exhibit J-3	Display Advertisement and Newspaper Articles
Exhibit J-4	BLM Informational Letters

### INTRODUCTION

This exhibit includes information on the public involvement program that has been conducted for the PV Hub to TS-5 Transmission Project. Public outreach efforts began in March 2004 to provide information to agencies and individuals, solicit information on the project area, and identify potential issues relative to the project.

### PUBLIC INVOLVEMENT PROGRAM SUMMARY

The Applicant and EPG have studied over 200 miles of alternatives for a new 500kV transmission line in the West Valley. The regional study area included portions of the Town of Buckeye, as well as the unincorporated communities of Tonopah and Wintersburg. A public involvement program was initiated at the onset of the planning process to ensure that local jurisdictions and community residents were provided with the opportunity to relay information or potential concerns.

To reach the affected communities, the Applicant utilized a number of methods including a telephone information line, project website, newsletter and mailing list, public open house, media relations, and small group meetings and local official briefings. The BLM also provided two project letters to notify people on the BLM mailing list about the project. By providing the public with multiple opportunities to access project information and relay comments, the project team was able to identify potential issues and address them through the planning process and environmental studies.

#### Telephone Information Line

A telephone information line, (602) 794-9000, was established early in the project to provide the public with easy access to project information and team members. The telephone line relayed

project updates and public meeting dates, and allowed callers to leave a comment regarding the project or a message requesting they be added to the project mailing list or contacted by a team member. This telephone line was advertised in newsletters, on the project website, and in paid advertisements. To date, 23 comments or messages have been received on this telephone line.

### **Website**

A website, <http://siting.apsc.com>, was utilized and maintained to provide access to project information and electronic versions of distributed materials. Through the website, viewers could obtain meeting dates, view current and past newsletters, routing maps, submit written comments or requests, and be added to the mailing list. The website address was advertised in newsletters, on the telephone information line, and in paid advertisements. To date, 16 comments have been received through the website.

### **Newsletters and Mailing List**

A project newsletter was prepared and distributed to approximately 7,600 people in March 2004. The mailing list included all APS customers and private landowners within the study area, as well as jurisdictional and local government leaders and the BLM Phoenix Field Office mailing list. Those who attended the public open house or submitted comments were added to the project mailing list to receive any future newsletter(s). The newsletter provided team contact information, including the phone line number and website address, as well as a project update. A copy of the newsletter can be found in Exhibit J-1. The newsletter served to introduce the project to the public and included a description of the proposed facilities, need for the project, environmental planning process, public information opportunities, proposed route, state and federal permitting requirements, and announced the first public open house for March 2004. A second newsletter is planned for distribution in May 2005.

### **Public Open House**

One public open house was conducted on March 30, 2004 to introduce the project and obtain public feedback. The meeting was held in Tonopah, Arizona and was attended by 37 people. The open house was announced through paid advertisements, the initial project newsletter, the telephone information line, and the project website. The open house was organized in an informal format, allowing community members to attend at their convenience, review displays, and speak with project team members. General information was presented on project need, description, environmental resources, alternatives evaluated, and the planning process. Comment forms were provided to solicit public comment on the Proposed Route and Proposed Alternative Route and information that had been presented. A total of 16 comment forms were received either during the open house or by mail following the meeting. A sample open house comment form is included in Exhibit J-2.

## **Media Relations**

The Applicant briefed local news sources and placed paid advertisements for the March open house meeting. In particular, the Applicant briefed the *West Valley View Newspaper* and *Arizona Republic*. Display advertisements announcing the open house were placed in the *Arizona Republic*, *West Valley View*, and *Buckeye Valley News*. Both the *West Valley View* and *Buckeye Valley News* ran articles on the project describing the purpose and need for the project and the upcoming federal and state planning processes. The display advertisement and copies of these articles are included in Exhibit J-3.

## **Small Group Meetings and Local Official Briefings**

### **Jurisdictional Meeting**

In mid-March 2004, the Applicant invited members of potentially impacted agencies or jurisdictions to a meeting at which they could review project information and discuss potential concerns in a small, informal setting. The meeting was scheduled to closely coincide with the mailing of the first project newsletter, which announced the project to the general public. Ten representatives of nine separate jurisdictions or agencies were invited to the meeting. Seven people representing the BOR, Luke Air Force Base, CAWCD, Maricopa County, and Town of Buckeye attended the meeting.

During the meeting, the project team presented a project overview, including a description of other APS projects in the West Valley and a summary of past efforts with the BLM to identify utility corridors in the BLM RMP revision. The presentation also included information on the project description and planning process, including state and federal permitting requirements.

### **Local Official Briefings**

Throughout the project, team members held meetings with local jurisdiction representatives, including elected officials and planning organizations, to relay project information and answer questions. Meetings were held with county supervisors Max Wilson, Andy Kunasek, and Mary Rose Wilcox. Presentations also were provided for Luke Air Force Base, ASLD, Maricopa County Trails Commission, and the Buckeye Town Council. These meetings enabled the project team to identify issues held, consider suggestions during the planning process, and relay information on current project developments.

The Applicant met with and received information from private developers during the planning process. A meeting was held with representatives of private developments planned in the vicinity of the TS-5 Substation in February 2004 to introduce the project along the eastern portion of the transmission line route and solicit feedback from attendees.

Table J-1 provides a summary of the small group meetings and local official briefings that occurred as part of the planning process.

<b>TABLE J-1 SMALL GROUP MEETINGS AND LOCAL OFFICIAL BRIEFINGS</b>		
<b>Jurisdiction/Representation</b>	<b>Date</b>	<b>Summary/Topic</b>
<b>FEDERAL</b>		
BLM Phoenix Field Office	01/15/03	Discussed RMP process and PV to Table Mesa project
BLM Phoenix Field Office Chris Horyza, Project Manager	02/07/03	Discussed RMP process and PV to Table Mesa project
BLM Phoenix Field Office	03/04/03	Discussed RMP process and planned transmission projects including PV to Table Mesa project
BLM Phoenix Field Office	03/28/03	Discussed official response to RMP planning process
CAP Gary Ijams	04/03/03	Meeting regarding PV to Table Mesa project
WAPA	05/14/03	Coordination meeting, discussion of PV to Table Mesa project
WAPA	07/17/03	Coordination meeting, discussion of PV to Raceway (formerly Table Mesa) project
WAPA	08/21/03	Coordination meeting
WAPA	10/07/03	Coordination meeting
BLM Phoenix Field Office	11/19/03	Discussed PV to Raceway project, BLM utility corridors, NEPA process
Luke Air Force Base Rusty Mitchell	02/24/04	Discussed structure heights, general project information
BLM Phoenix Field Office	04/22/04	Interdisciplinary Team meeting
BLM Phoenix Field Office	03/09/04	Project update meeting
Luke Air Force Base	03/17/04	Project update meeting
CAP Gary Ijams	05/19/04	Discussed possible use of CAP right-of-way
CAP Gary Ijams	07/13/04	Discussed possible use of CAP right-of-way
BLM Phoenix Field Office	08/05/04	Project update meeting
CAP and BOR	11/10/04	Discussed possible use of CAP right-of-way
CAP	11/29/04	Discussed possible use of CAP right-of-way
<b>STATE</b>		
Arizona State Land Dept. Linda Beals	02/25/04	Discussed PV to TS-5 and Williamson Valley projects
Arizona Corporation Commission Jerry Smith	05/24/04	Project summary
Arizona Corporation Commission Jerry Smith	11/17/04	Project update
Arizona Corporation Commission Jerry Smith	03/24/05	Project update
<b>COUNTY</b>		
Maricopa County Supervisors Andrew Kunasek, Max Wilson, county staff	06/02/04	Project briefing
Maricopa County Supervisor Mary Rose Wilcox	06/11/04	Project briefing

**TABLE J-1  
SMALL GROUP MEETINGS AND LOCAL OFFICIAL BRIEFINGS**

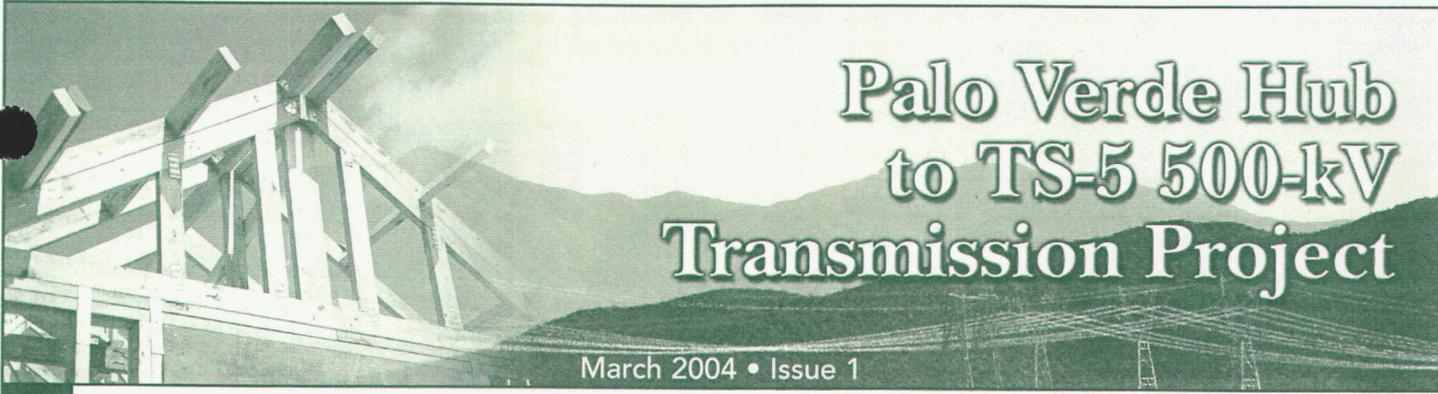
<b>Jurisdiction/Representation</b>	<b>Date</b>	<b>Summary/Topic</b>
Maricopa County Trails Commission	06/16/04	Project presentation
<b>LOCAL</b>		
Buckeye Town Council	08/03/04	Project presentation
Town of Buckeye Carroll Reynolds	04/15/05	Project update
<b>ORGANIZATIONS</b>		
CATS	02/13/03	Presentation on BLM RMP process and PV to Table Mesa project
CATS	02/26/03	Discussed formal submission on BLM RMP process and various CATS projects including PV to Table Mesa project
CATS	03/10/03	Discussed BLM RMP planning process and formal response
Douglas Ranch Marty Hedlund	12/01/03	Discussed West Valley North and PV to TS-5 projects
Sun Valley Dick Maes	12/01/03	Discussed West Valley North and PV to TS-5 projects
SCE	04/14/04	Discussed project
Arlington Valley Power Plant	05/03/04	Discussed potential interconnection
Mesquite Power Plant	05/25/04	Discussed potential interconnection
SCE	08/10/04	Project update meeting
Pulte Homes	10/19/04	Discussed West Valley North and PV to TS-5 projects
SCE	11/12/04	Conference call regarding project
SCE	1/13/05	Conference call regarding project
Southwest Valley Homebuilders Group	1/28/05	Project briefing
<b>MISCELLANEOUS</b>		
Luke Air Force Base, BOR, CAP, Maricopa County, Town of Buckeye	03/18/04	Jurisdictional meeting (see meeting summary on page J-3)
BLM – Bureau of Land Management BOR – Bureau of Reclamation CAP – Central Arizona Project CATS – Central Arizona Transmission Study		NEPA – National Environmental Policy Act RMP – Resource Management Plan SCE – Southern California Edison WAPA – Western Area Power Administration

**BLM Informational Letters**

An informational letter describing the proposed project and the project study area was distributed by the BLM in March 2004 to over 300 individuals on their mailing list who live within the study area. The letter invited recipients to provide any comments to the BLM within a 30-day period.

A second BLM informational letter was developed and distributed in September 2004 to inform the public regarding a modification to the project description to include the Harquahala 500kV Interconnection Area as a potential system option for the development of the proposed project. The informational letter was distributed to the same individuals who received the initial BLM letter in March 2004. Both BLM informational letters are included in Exhibit J-4.

**EXHIBIT J-1**  
**PROJECT NEWSLETTER**



# Palo Verde Hub to TS-5 500-kV Transmission Project

March 2004 • Issue 1

## APS Proposes New Transmission Facilities

APS has plans to build a new 500-kilovolt (500-kV) transmission line and substation in the far west and northwest areas of the valley, where unprecedented growth is occurring.

According to a February 2004 issue of *The Phoenix Business Journal*, the West Valley will be home to about 250,000 new homes over the next 50 years. In addition, the average household usage of electricity in Arizona has increased about 21 percent over the past decade. Growth figures like these underscore the need to build new electrical facilities.

APS' 500-kV project will provide the electrical transmission infrastructure that will bring bulk power into this high-growth area. It provides the electrical source to feed the 230-kV transmission system that will be needed in the area. The project also will strengthen the entire APS

transmission system by providing an additional high-voltage transmission source to the Phoenix Metropolitan area, allowing the import of power from generating sources at, or around, the Palo Verde Nuclear Generating Station (PVNGS).

### Project Description

The proposed transmission line will be between 40 to 45 miles in length and will be constructed on either tubular steel poles or lattice towers, typically between 130 to 150 feet high. The project will begin at the PVNGS hub and will terminate at a new 500/230-kV substation in the Sun Valley area (see map in this newsletter).

### State and Federal Components of Project

In the first quarter of 2003, APS began working with the Bureau of Land Management (BLM), Phoenix Field Office. The

### In This Issue

- Project Description
- State and Federal Components
- Proposed Route
- Environmental Process
- Public Participation
- Project Schedule

For More Information visit the Project Web site at <http://siting.apsc.com> or call the project information line at (602) 794-9000.

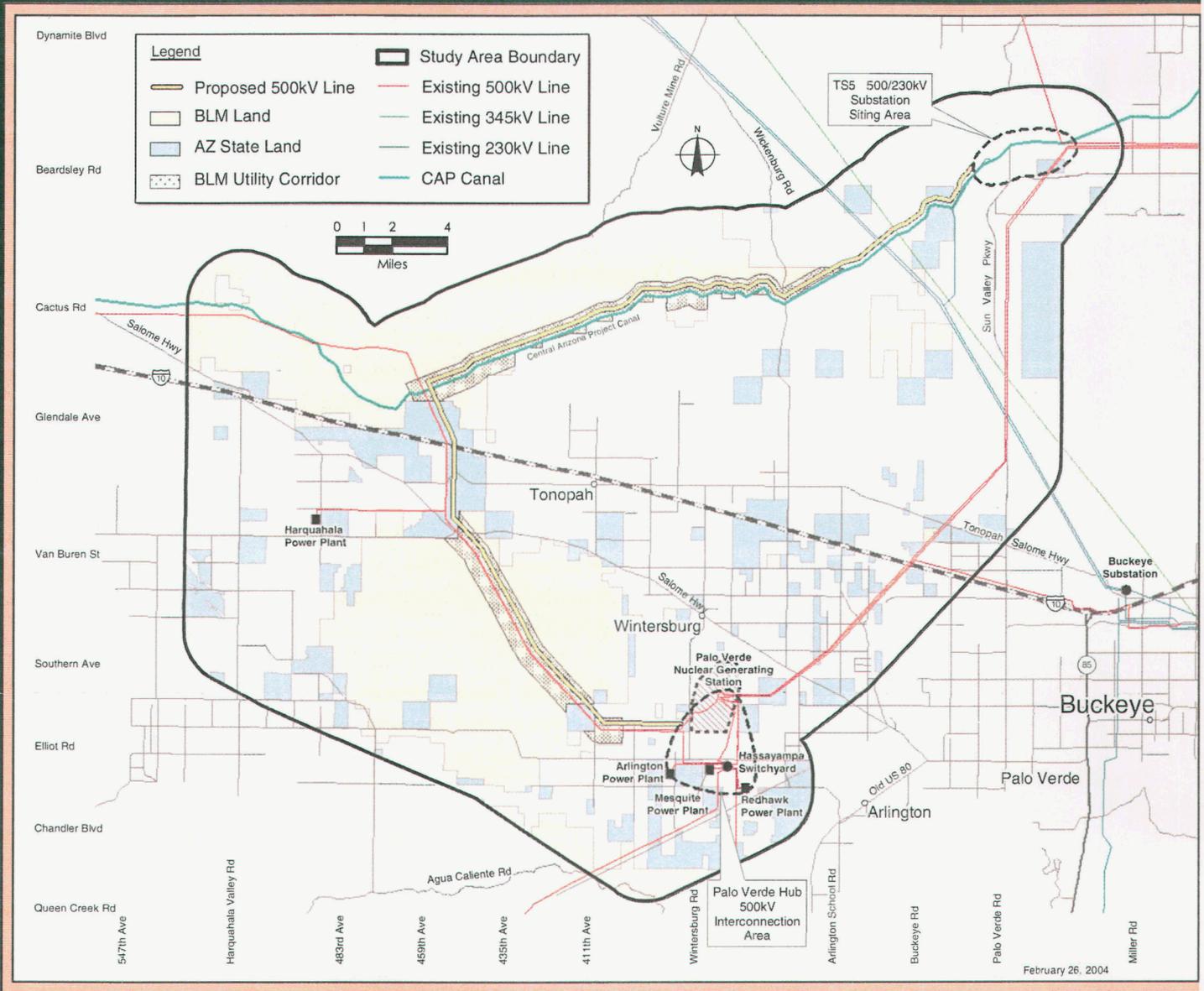


**APS**

THE POWER TO MAKE IT HAPPEN®

Questions? Call (602) 794-9000 or visit our Web site at <http://siting.apsc.com>

# Palo Verde Hub to TS-5 500-kV Transmission Project



bureau had begun updating its resource management plans, which included designating utility corridors through their federal lands. One of these plans, the Bradshaw – Harquahala Range Plan, includes part of the study area for APS’ 500-kV project. The BLM’s final draft plan is expected to include APS’ recommendations that the existing Devers – Palo Verde 500-kV transmission line and the Central Arizona

Project be included in a one-mile wide designated utility corridor (see map).

Because APS proposes that the new 500-kV power line, in part, be located on federal land, adherence to the National Environmental Policy Act (NEPA) is required. APS has filed a right-of-way application on the proposed project and, as required under NEPA, APS will conduct an

Environmental Assessment (EA) as part of that right-of-way application process.

In addition to the federal planning requirements for the project, APS will prepare a Certificate of Environmental Compatibility (CEC) application for state permitting of the project. This application will be filed with the Arizona Power Plant and Transmission Line Siting Committee, which will hold public hearings on the project. The CEC application documents the proposed project's purpose and need, description, cost, federal and state permitting efforts, associated environmental issues and the public outreach efforts.

The state siting committee makes a formal recommendation on the project to the Arizona Corporation Commission, which makes a final determination on a power line route and substation location.

### **Proposed Route**

APS' proposed 500-kV line would begin at one of several interconnection points at the Palo Verde hub and parallel the existing Devers - Palo Verde 500-kV power line for approximately 18 miles, 10 of which would be within the proposed one-mile-wide BLM designated utility corridor. The proposed route would then parallel the CAP canal for approximately 23 miles, 17

of which would be within another BLM one-mile-wide utility corridor.

### **Environmental Process**

APS has retained an outside environmental consulting firm, the Environmental Planning Group (EPG), based in Phoenix, to conduct the required environmental analysis on the project. EPG will conduct five primary tasks:

- 1) Regional study/identification of preliminary alternatives;
- 2) Detailed inventory;
- 3) Impact assessment and mitigation planning;
- 4) Environmental assessment report preparation; and
- 5) Preparation of the CEC application.

### **Public Information**

The public is invited to learn more about the project in several ways:

- Open houses, with their informal formats allow individuals to meet with project team members one-on-one and talk through the latest project information.
- Project information will be posted at <http://siting.apsc.com>.
- Newsletters will be mailed to APS customers, landowners and others with interest in the project area.

- The project telephone information line at (602) 794-9000 also will carry up-to-date information.
- The federal NEPA and state siting processes are also public and allow various levels of comment opportunities and involvement.

### **First Project Open House**

The first project open house will be held March 30, 2004, at Ruth Fisher Elementary School, 38201 W. Indian School Road. The public may attend any time between 6 and 8 p.m. to talk one-on-one with project team members. We look forward to seeing you there.

### **Project Schedule**

While the project informally began through discussions with the BLM in early 2003, the environmental planning, public, state and NEPA processes will extend into the fourth quarter of 2004. APS plans to file for a Certificate of Environmental Compatibility (CEC) with the Arizona Corporation Commission in late 2004, with state siting hearings anticipated in the first quarter of 2005. The entire project is planned to be completed and operational by the summer of 2007.





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Phoenix, AZ 85072

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**IMPORTANT INFORMATION  
FOR PROPERTY OWNERS**

## Palo Verde Hub to TS-5 500-kV Transmission Project

Please attend the upcoming  
**Public Information Open House**

6 to 8 p.m. - Tuesday, March 30, 2004

Ruth Fisher Elementary School  
38201 W. Indian School Road  
Tonopah, Arizona 85354

If you are unable to attend the open house, please visit our web site at  
<http://siting.apsc.com> or call (602) 794-9000 to learn more about the project.



**EXHIBIT J-2**  
**OPEN HOUSE COMMENT FORM**



**EXHIBIT J-3**  
**DISPLAY ADVERTISEMENT AND NEWSPAPER ARTICLES**



Please attend the upcoming

**PUBLIC  
INFORMATION  
OPEN HOUSE**

6 - 8 p.m., Tuesday, March 30, 2004  
Ruth Fisher Elementary School  
38201 W. Indian School Road

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APS is planning to build new facilities to enable us to provide safe, reliable electric service to the rapidly growing West and Northwest valley. The Palo Verde Hub to TS-5 500-kilovolt (kV) Transmission Project is our plan to accommodate growth and increase the overall reliability of the APS transmission system.

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For more information please call us  
at (602) 794-9000

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## Project Description

The proposed transmission line will be between 40 to 45 miles in length and will be constructed on either tubular steel poles or lattice towers, typically between 130 to 150 feet high. The project will begin at the PVNGS hub and will terminate at a new 500/230-kV substation in the Sun Valley area. (See map.)

## State and Federal Components of Project

In the first quarter of 2003 APS began working with the Bureau of Land Management (BLM), Phoenix Field Office. The bureau had begun updating its resource management plans, which included designating utility corridors through their federal lands. One of these plans, the Bradshaw – Harquahala Range Plan, includes part of the study area for APS' 500-kV project.

The BLM's final draft plan is expected to

include APS' recommendations that the existing Devers – Palo Verde 500-kV transmission line and the Central Arizona Project be included in a one-mile wide designated utility corridor.

Because APS proposes that the new 500-kV power line, in part, be located on federal land, adherence to the National Environmental Policy Act (NEPA) is required. APS has filed a right-of-way application on the proposed project and, as required under NEPA, APS will conduct an Environmental Assessment as part of that right-of-way application process.

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# APS unveils new 500kV power line project

## Proposed route is PVNGS to north of White Tanks

by Darryl Henning  
assistant managing editor

In an effort to get ahead of the expected power demand from residential and commercial developments planned north of Interstate 10 and west of the White Tank Mountains, Arizona Public Service Co. is proposing a new 500-kilovolt power transmission line project.

APS unveiled the project to the public at a March 30 open house at Ruth Fisher Elementary School in Tonopah. "The project actually has been in the mix for a couple of years, but it's changed a little bit in scope from its inception," said Paul Herndon, APS' project manager for the 500kV line. "Originally, it was going to go all the way to the Table Mesa Substation way up on Interstate 17. Now, it's moved back."

As envisioned now, the Palo Verde Hub to TS-5 500kV Transmission Project would be done in two phases.

Phase I would bring the proposed 500kV transmission line northeasterly from the Hassayampa Switchyard at Palo Verde Nuclear Generating Station in Tonopah to connect with a substation to be built north of the White Tank Mountains in Surprise. That facility is to be called the TS-5 Substation, short for transmission station No. 5. A 2007 in-service date is projected for that line.

At the same time, APS is working on the West Valley North project, which would bring a 230kV transmission line from a substation near the Beardslry Canal and Olive Avenue to the TS-5 Substation.

Phase II of Palo Verde Hub to TS-5 500kV Transmission Project would take the 500kV line from the TS-5 Substation to the Raceway Substation in Peoria, just south of Lake Pleasant. The projected in-service date for that second-phase stretch of transmission line is 2010.

All totaled, the proposed transmission line will be between 40 and 45 miles in length. APS will use either tubular steel poles or lattice towers, typically between 130 and 150 feet high and similar to those that run along

Sun Valley Parkway. "There's a lot of generation now around Palo Verde Nuclear Generating Station, but we're still in need of more transmission," Herndon said, noting that the new 500kV line would serve two purposes.

"First, it allows a new 500kV line to take the additional generation out of the Palo Verde hub area into the planning area north into the Sun Valley area, a projected high-growth area," he explained. "It will bring the infrastructure that will free the 230kV transmission system that will be needed in the area to serve Festival Ranch, Douglas Ranch and other developments there."

"It also will embellish the entire APS transmission system by providing additional resources."

### APS-proposed route would use 80% public land

Unlike other projects, such as the Southwest Valley 500kV Transmission Line Project and the West Valley South and North projects, APS has brought forth its latest 500kV transmission line project with a proposed route.

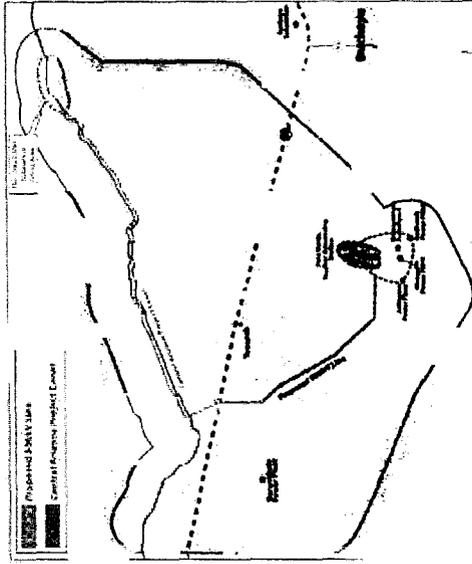
For those other projects, the company proposed several possible routes, and then took public and governmental comment on the routes to come up with a favored course to present to the Arizona Corporation Commission, the ultimate authority for approving the transmission line route.

In a preliminary review in 2003 of possible routes for the 500kV line, Phoenix-based EPC, an environmental consulting firm hired by APS, learned that the Bureau of Land Management was updating its resource management plans at the time.

"Based on that, we came up with a route from Palo Verde that would follow existing lines on BLM land and then follow an existing utility corridor along the Central Arizona Project Canal," Herndon said. "That would put about 80 percent of this project on public land as opposed to private land."

"That would help speed the process, and would allow us to parallel something that's already impacted the environment."

APS already has met with many of the stakeholders in the area. "And at least initially, we haven't heard anyone voice any opposition to it," Herndon said.



APS mailed out nearly 8,000 project-information brochures to area residents notifying them of the parameters of the proposed line project and of the March 30 open house.

"We've also met with Douglas Ranch and Festival Ranch representatives to see what we can do to lessen the impacts of the project on them," Herndon said.

APS will take all of the comments from stakeholders, governmental jurisdictions and open-house attendees and factor them into its planning. Other open houses will be held, and the Corporation Commission siting process will include public hearings.

### Timeline

EPC will assist APS in filing its application for a certificate of environmental compatibility for the proposed transmission line. It will conduct and prepare an environmental assessment of the project, which will form the basis for the certificate of environmental compatibility application, EPC Principal Paul Treter said.

"We expect to begin doing an impact assessment and

(See APS on page A28)

# APS

(From Page A25)

mitigation planning in April," Trenter said. "That will document all of the potential environmental issues, and how we would intend to mitigate them."

He estimated that it would be completed by mid summer and put out for public review by late summer.

"In conjunction with that, we will be putting together the CEC paperwork for the project," Trenter added. "We'd like to have that filed in late third quarter or early fourth."

Hearing before the Corporation Commission's Siting Committee likely would be scheduled in February 2005, Herndon added, anticipating approval a couple of months later. Then APS would have to do engineering plans for the project and acquire rights of way of private land.

Construction would begin in 2006, he added.

"The Southwest Valley 500kV Project was about 37 miles long and took about a year to build," Herndon said. "This project potentially is just a little longer, but would take about the same time to build. The hoped-for in-service date is summer 2007."

To learn more about the Palo Verde Hub to TS-5 500kV Transmission Project, call 602-794-9000 or visit <http://siting.apsc.com> online.

**EXHIBIT J-4**  
**BLM INFORMATIONAL LETTERS**



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Phoenix Field Office  
21605 North 7th Avenue  
Phoenix, AZ 85027

In reply refer to:

2800 (020)  
AZA-32639

March 24, 2004

### **Request for Comments for the Proposed Right-of-Way for the Arizona Public Service Palo Verde Hub to TS 5 Transmission Project, Maricopa County, Arizona.**

#### **INTRODUCTION**

The Bureau of Land Management (BLM) requests your comments relating to the proposed Right-of-Way (R/W) on public lands for the Arizona Public Service (APS) – TS 5 Project located in Maricopa County, Arizona (see enclosed project map).

The purpose of this mailer is to notify potentially interested parties including local, state, and federal agencies and adjacent land owners of the proposed project. All comments must be received by April 30, 2004, and will be reviewed as part of the environmental analysis for the project. At this time, the BLM has decided to prepare an Environmental Assessment (EA) to determine whether or not the project will have significant environmental effects. The EA is expected to be available for public comment by first quarter of 2005.

#### **PROPOSED ACTION**

The Proposed Action involves one 500 kV transmission power line on steel pole and/or lattice structures which would be constructed within a R/W that is approximately 200 feet in width and approximately 40 to 45 miles in length, including approximately 26 miles of BLM administered land. The proposed R/W, as it affects public land, would be built within the Palo Verde to Devers utility corridor as identified in the Lower Gila South Resource Management Plan (1988) and the Central Arizona Project (CAP) utility corridor as identified in the Lower Gila North Management Framework Plan (1983). The proposed action requires environmental compliance subject to the National Environmental Policy Act (NEPA).

The R/W of the proposed action would directly impact up to approximately 630 acres of public lands.

#### **DECISION TO BE MADE**

The decision to implement the Proposed Action involves the BLM, which has jurisdiction for approximately 630 acres of public lands involved in the project.

Implementation of the Proposed Action will depend on the following: 1) BLM Field Manager reviews the EA, including comments received, and documents the decision in a Decision Record that contains a Finding of No Significant Impact (FONSI); or 2) makes the decision to prepare an Environmental Impact Statement (EIS).

## ISSUES

At a minimum, the EA will discuss the existing conditions of each resource and environmental consequences of the Alternative(s) on the following issues:

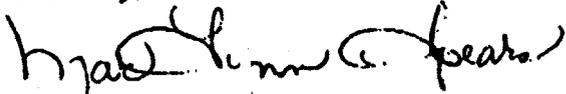
- Biological Resources (plants, wildlife, threatened and endangered species, and livestock grazing)
- Cultural Resources (archaeological sites)
- Land Use (recreation, access, R/W, etc.)
- Socio-economics
- Physical Resources (waters of the U.S., ground/surface water use, air quality, etc.)
- Visual Resources

## NEPA PROCESS

- 30-day public comment period
- Preparation of EA
- Decision Record issued
- Public Protest & Appeal Period

If you have any questions, please contact Camille Champion at (623) 580-5526.

Sincerely,

  
for Teresa Rami  
Field Manager

Enclosure  
(1) Project Map

# PALO VERDE HUB TO TS5 500KV PROJECT

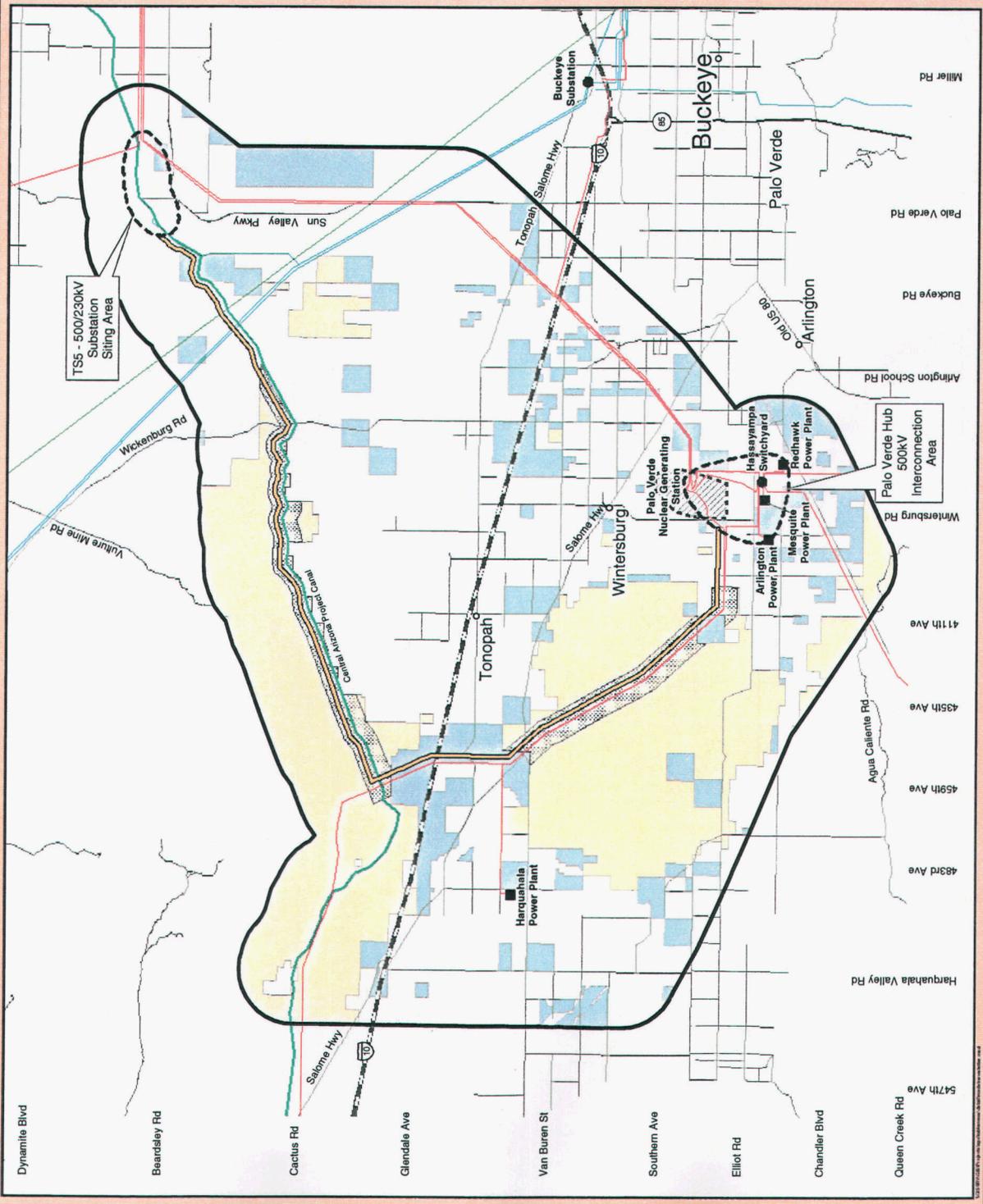
## Legend

-  Proposed 500kV Line
-  BLM Land
-  AZ State Land
-  BLM Utility Corridor
-  Study Area Boundary
-  Existing 500kV Line
-  Existing 345kV Line
-  Existing 230kV Line
-  CAP Canal

## SOURCES

Arizona State Land Department, AZ Department of Transportation,  
US Department of Transportation, US Bureau of Land Management

February 23, 2004



12/27/03 08:25:30 AM - 12/27/03 08:25:30 AM



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Phoenix Field Office  
21605 North 7th Avenue  
Phoenix, AZ 85027

In reply refer to:

2800 (020)  
AZA-32639

September 15, 2004

### **Request for Comments for the Updated Proposed Right-of-Way for the Arizona Public Service Palo Verde Hub to TS5 Transmission Project, Maricopa County, Arizona.**

#### **INTRODUCTION**

The Bureau of Land Management (BLM) requests your comments relating to the updated proposed Right-of-Way (R/W) on public lands for the Arizona Public Service (APS) – TS5 Project located in Maricopa County, Arizona (see enclosed project map).

The purpose of this mailer is to notify potentially interested parties including local, state, and federal agencies, and adjacent land owners of the updated proposed project described below. All comments must be received by October 20, 2004, and will be reviewed as part of the environmental analysis for the project. At this time, the BLM has decided to prepare an Environmental Assessment (EA) to determine whether or not the project will have significant environmental effects. The EA is expected to be available for public comment later this fall.

#### **PROPOSED ACTION**

The Proposed Action involves one single-circuit 500kV transmission line constructed on steel lattice or pole structures. The right-of-way would be approximately 200 feet in width and approximately 44 to 54 miles in length, including approximately 26 miles on BLM administered land. The proposed 500kV transmission line would originate at the Palo Verde Hub, at either the Palo Verde Nuclear Generating Station (PVNGS) Switchyard or the Duke Arlington Power Plant, and terminate at the future TS5 500/230kV Substation Site, to be located adjacent to the Central Arizona Project (CAP) canal at the CAP Pump Facility, west of 291st Avenue and north of the Beardsley Road alignment.

The Proposed Action may be built in its entirety with an in-service date of June 2007, or could be constructed in phases with the second phase in-service in the 2015 timeframe or later. The two options are detailed below.

Option 1: The Proposed Action may be constructed as one continuous project from the Palo Verde Hub to the future TS5 500/230kV Substation Site adjacent to the CAP Pump Facility. The in-service date is projected for June 2007. The proposed right-of-way, as it affects public land, would be built within the Palo Verde to Devers utility corridor as identified in the Lower Gila South Resource Management Plan (1988) and the CAP utility corridor as identified in the Lower Gila North Management Framework Plan (1983). The proposed action requires environmental compliance subject to the National Environmental Policy Act (NEPA).

Option 2: The Proposed Action may be constructed in two phases if the project originates at the Harquahala 500kV Interconnection Area. The Harquahala 500kV Interconnection Area would interconnect at either the Harquahala Power Plant (located approximately at Thomas Road and 491<sup>st</sup> Avenue) or a new switchyard facility that could be constructed at the intersection of the Palo Verde-Devers No. 1 line and the Harquahala to Palo Verde 500kV line (located approximately at Thomas Road west of 451<sup>st</sup> Avenue). This switchyard is being referred to as the Harquahala Junction 500kV Switchyard. The first phase of this project proposal would begin at the Harquahala 500kV Interconnection Area and would parallel the Palo Verde-Devers No. 1 Transmission Line to the north, and the CAP utility corridor to the east a total of approximately 29 to 34 miles, terminating at the future TS5 500/230kV Substation Site adjacent to the CAP Pump Facility. The in-service date for the first phase is projected for June 2007. The second phase would also begin at the Harquahala 500kV Interconnection Area and traverse south along the Palo Verde-Devers No. 1 and Harquahala 500kV corridor approximately 15 to 20 miles to the Palo Verde Hub. The in-service date for this phase is proposed for 2015 or beyond. The proposed action requires environmental compliance subject to NEPA.

### **DECISION TO BE MADE**

The decision to implement the Proposed Action involves the BLM, which has jurisdiction for approximately 630 acres of public lands involved in the project.

Implementation of the Proposed Action will depend on the following: 1) BLM Field Manager reviews the EA, including comments received, and documents the decision in a Decision Record that contains a Finding of No Significant Impact (FONSI); or 2) makes the decision to prepare an Environmental Impact Statement (EIS).

### **ISSUES**

At a minimum, the EA will discuss the existing conditions of each resource and environmental consequences of the Alternative(s) on the following issues:

- Biological Resources (plants, wildlife, threatened and endangered species, and livestock grazing)
- Cultural Resources (archaeological sites)
- Land Use (recreation, access, R/W, etc.)
- Visual Resources
- Socio-economics
- Physical Resources (waters of the U.S., ground/surface water use, air quality, etc.)

**NEPA PROCESS**

- 30-day public comment period
- Preparation of EA
- Decision Record issued
- Public Protest & Appeal Period

If you have any questions, please contact Camille Champion at (623) 580-5526.

Sincerely,

  
for Teresa A. Raml  
Field Manager

Enclosure  
Project Map

# PALO VERDE HUB TO TS5 500KV TRANSMISSION PROJECT

## Proposed Route

-  Option 1 (in-service 2007)
-  Option 2 - Phase 1 (in-service 2007)
-  Option 2 - Phase 2 (in-service 2015 or beyond)

## Reference Features

-  BLM Land
-  Bureau of Reclamation
-  Arizona State Land
-  Designated Utility Corridor (BLM)
-  Study Area
-  500KV Transmission Line
-  345KV Transmission Line
-  230KV Transmission Line
-  Central Arizona Project Canal

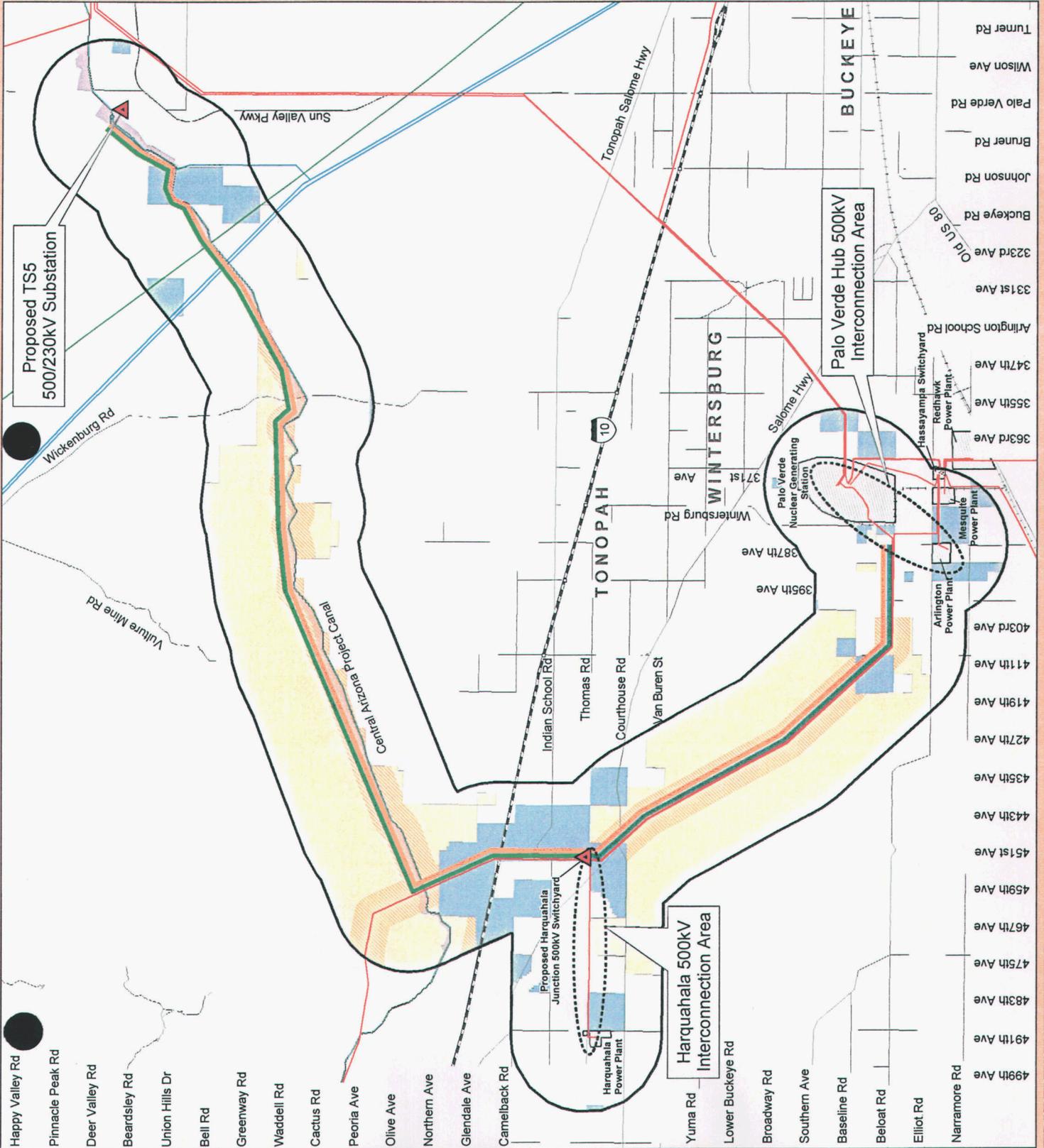
## Project Location



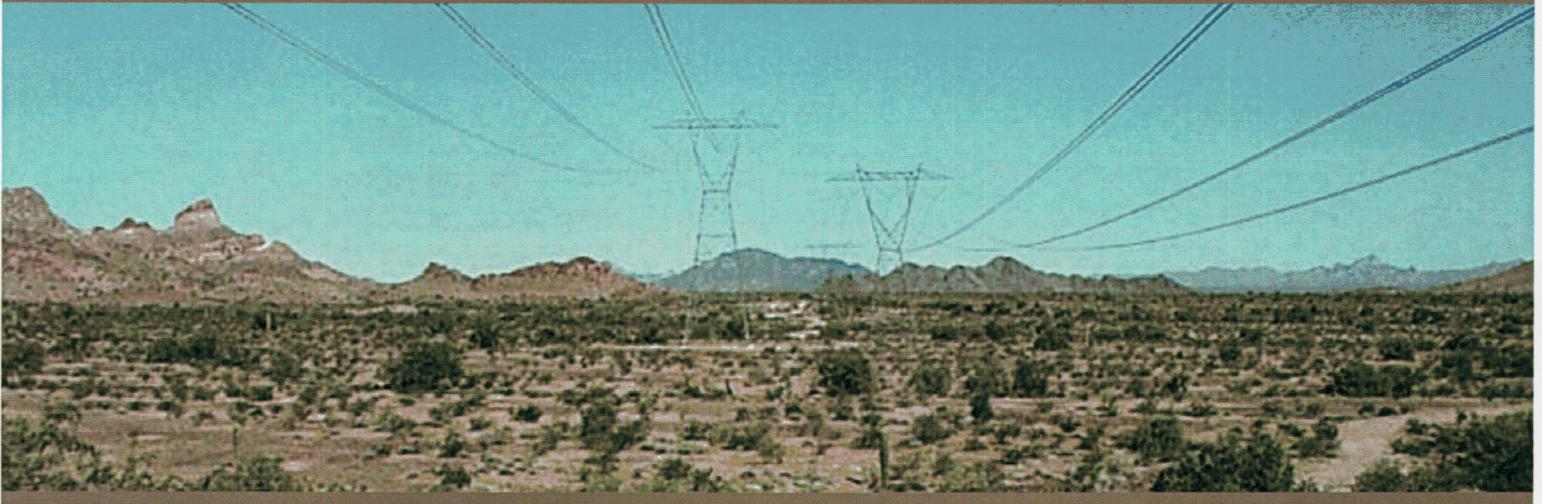
## Sources

US Bureau of Land Management,  
AZ Department of Transportation,  
US Department of Transportation

September 14, 2004



# ● PALO VERDE HUB TO TS-5 SUBSTATION 500kV TRANSMISSION PROJECT



## EXHIBIT B-1 ENVIRONMENTAL ASSESSMENT

PREPARED FOR

UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
PHOENIX FIELD OFFICE

SUBMITTED BY



ARIZONA PUBLIC SERVICE

MAY 2005

**PALO VERDE HUB TO TS-5 SUBSTATION**

**500KV TRANSMISSION PROJECT**

**ENVIRONMENTAL ASSESSMENT**

Prepared by

**EPG, Inc.**

4350 E. Camelback Road, Suite G200  
Phoenix, Arizona 85018

**BLM Case File No. AZ A-32639**

**NEPA No. AZ-020-2004-0056**

**April 2005**

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## LIST OF ACRONYMS

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ACC	Arizona Corporation Commission
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AMA	Active Management Area
APE	area of potential effect
APS	Arizona Public Service Company
Arlington Power Plant	Arlington Valley Energy Facility Power Plant
ASLD	Arizona State Land Department
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
EA	Environmental Assessment
EPG	Environmental Planning Group
FAA	Federal Aviation Administration
HDMS	Heritage Data Management System
HGP	Harquahala Generating Plant
HJS	Harquahala Junction 500kV Switchyard
IO	isolated occurrences
I-10	Interstate 10
KOP	Key Observation Point
kV	kilovolt
LAFB	Luke Air Force Base
MCDOT	Maricopa County Department of Transportation
MCRT	Maricopa County Regional Trail
Mesquite	Mesquite Power Generating Station
MFP	Management Framework Plan
MPA	Municipal Planning Area
MW	megawatts
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NOI	Notice of Intent

NRHP	National Register of Historic Places
PV Hub	Palo Verde Hub
PVNGS	Palo Verde Nuclear Generation Station
Redhawk	Redhawk Power Plant
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
SCE	Southern California Edison
SDG&E	San Diego Gas & Electric
SHPO	State Historic Preservation Office
SQRU	Scenic Quality Rating Units
SRMA	Special Recreation Management Area
SRP	Salt River Project
TDRP	Tonopah Desert Recharge Project
TESS	endangered species Internet site
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	United States Fish and Wildlife Service
VRM	Visual Resource Management
WAPA	Western Area Power Administration

# CHAPTER 1

## CHAPTER 1 – INTRODUCTION

---

### 1.1 BACKGROUND

Arizona Public Service Company (APS) has applied for a right-of-way grant (Case File Number AZA-32639) from the Bureau of Land Management (BLM) for the construction, operation, and maintenance of the proposed Palo Verde Hub (PV Hub) to TS-5 500 kilovolt (kV) Transmission Project. The TS-5 Substation would be a 500/230kV facility located south of the Hassayampa Pumping Plant along the Central Arizona Project (CAP) Canal. The proposed route parallels a portion of the existing Palo Verde–Devers No. 1 500kV Transmission Line (Palo Verde–Devers No. 1) (AZA-23805) and the Harquahala–Hassayampa 500kV Transmission Line (AZA-31068), as well as the CAP Canal (AZA-22075). The proposed transmission line would be located within BLM-designated utility corridors (1 mile wide) on BLM lands. The remaining portions of the line would cross Bureau of Reclamation (BOR), Arizona State Trust, or private lands.

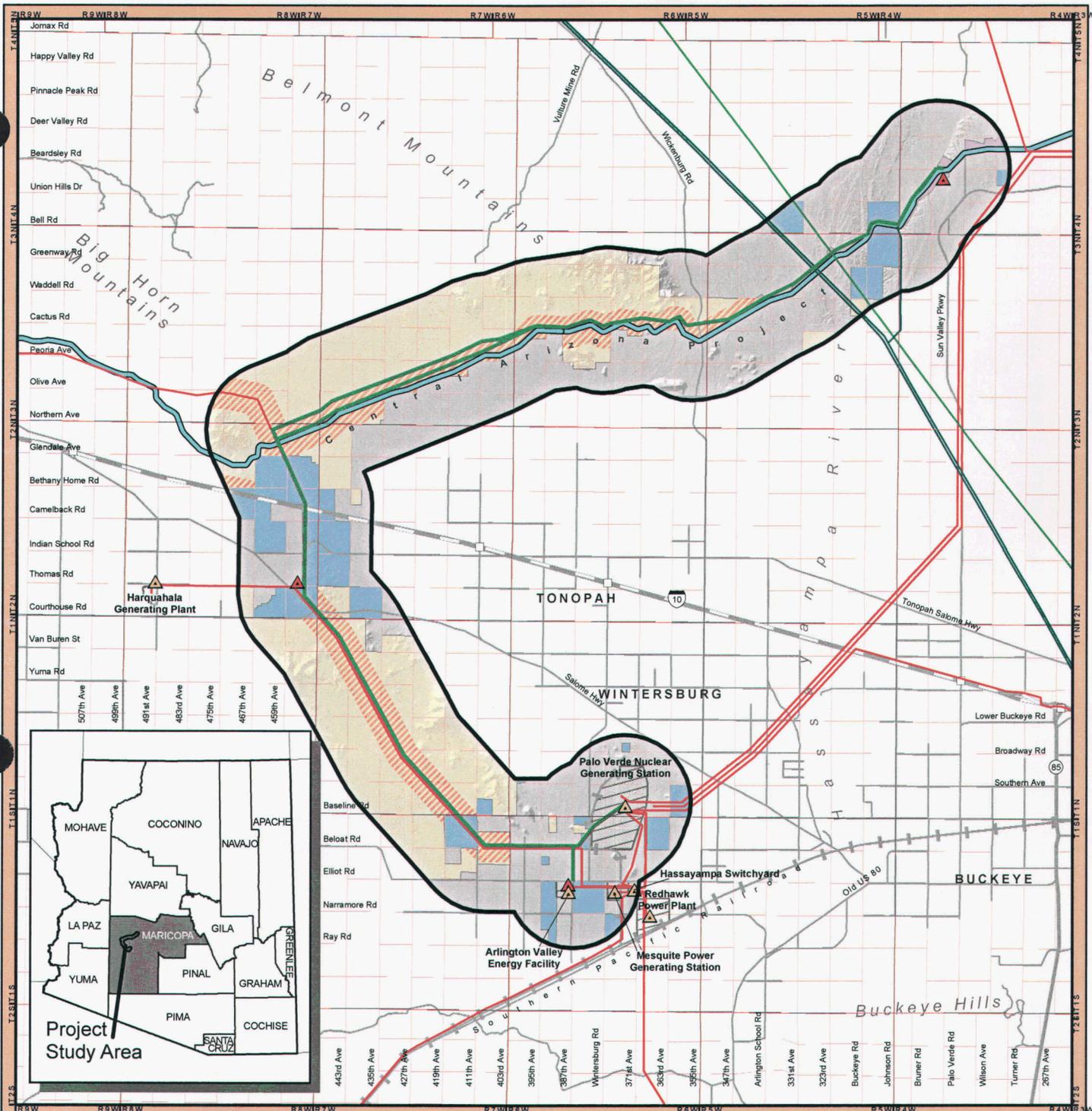
Figure 1-1 illustrates the proposed project location. The required right-of-way width would be 200 feet. The estimated length of the proposed transmission line route is approximately 42 to 44 miles, depending on the final system option selected, and crosses approximately 26 miles of BLM land.

This environmental assessment (EA) was prepared for the BLM Phoenix Field Office with the assistance of APS and Environmental Planning Group (EPG).

### 1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The proposed project is needed to support the increased development and growth occurring and anticipated in the western Phoenix metropolitan area. This project also will strengthen the entire APS Phoenix metropolitan area transmission system comprised of APS, Salt River Project (SRP), and Western Area Power Administration (WAPA) transmission facilities by providing an additional electrical transmission source to the valley (TS-5 Substation). Additionally, the proposed line will increase import transmission capability into the Phoenix metropolitan area as well as increase export transmission capability from the PV Hub. This project also allows the CAP Canal to access the PV Hub to obtain energy to service its pumping loads. The projected need date for the proposed 500kV line is the summer of 2007.

The proposed project is consistent with the latest APS 10-Year Plan, which was filed in January 2005 with the Arizona Corporation Commission (ACC).



- Legend**
- Study Area
  - Proposed Route
  - Existing Substation/Switchyard
  - Proposed Substation/Switchyard
  - Designated Utility Corridor (BLM)
  - Existing Generation Plant/Switchyard
  - Existing 500kV Transmission Line
  - Existing 345kV Transmission Line
  - Existing 230kV Transmission Line
  - Bureau of Land Management
  - Bureau of Reclamation
  - Arizona State Trust Land
  - Private

**PALO VERDE HUB TO TS-5 500kV TRANSMISSION PROJECT**  
**Project Location**

**FIGURE 1-1**

April 29, 2005



**Sources**  
 AZ Department of Transportation (2003), US Department of Transportation (2003), US Bureau of Land Management (2003)



### 1.3 CONFORMANCE WITH RESOURCE MANAGEMENT PLANS

The BLM Phoenix Field Office is the lead federal agency for this EA. The proposed transmission line is located within BLM-designated utility corridors (1 mile wide) on federal lands including the Palo Verde-Devers Utility Corridor, identified as No. 2 on page 4 of the *Lower Gila South Resource Management Plan* (RMP) (BLM 1988). This line also is located within the CAP Utility Corridor identified in Decision LGN-MFP-3-L-2.1 of the *Lower Gila North Management Framework Plan* (MFP) where the transmission line crosses federal land (BLM 1994). The proposed project complies with standards and guidelines specified in the RMP, including placement of new electrical transmission lines within BLM-designated utility corridors.

### 1.4 RELATIONSHIP TO STATUTES, REGULATIONS, AND OTHER PLANS

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA), Council on Environmental Quality Implementation Procedures outlined in 40 CFR Parts 1500-1508, BLM Arizona Environmental Handbook, and BLM Manual 1790 and NEPA Handbook 1790-1. The *Maricopa County Comprehensive Plan* (August 2002), *Tonopah/Arlington Area Plan* (September 2000), and *Town of Buckeye General Plan* (September 2001) also were reviewed during the evaluation of this project. Additionally, other planning efforts, including regional high-voltage transmission line projects, were considered.

### 1.5 ENVIRONMENTAL REVIEW PROCESS

This EA evaluates the potential environmental impacts of the Proposed Action and No-Action alternatives for the following environmental study areas:

- Land use and recreation
- Visual resources
- Cultural resources and Native American concerns
- Biological resources
- Socioeconomics
- Earth and water resources
- Health and Safety

The following critical elements of the environment were considered:

- Air Quality (Section 3.8)
- Areas of Critical Environmental Concern (Section 3.1)
- National Monument (Section 3.1)
- Environmental Justice (Section 3.6)
- Floodplains (Section 3.7)
- Native American Religious Concerns (Section 3.4)
- Threatened or Endangered Species (Section 3.5)
- Prime Farmlands (Section 3.2)
- Wastes, Hazardous or Solid (Section 3.7)

- Wetlands/Riparian Zones (Section 3.5)
- Wild and Scenic Rivers (Section 3.1)
- Wilderness Areas (Section 3.1)
- Invasive Species (Section 3.5)
- Standards for Rangeland Health (Section 3.5)
- Adverse Energy Impact (The Proposed Action, if approved, will not have a direct or indirect adverse impact on energy development, production supply, and/or distribution.)

The Arizona BLM has established an informal process for initiating EA-level documents, as described in the overview of BLM's NEPA process. This process consists of careful planning, and internal and external coordination with other governmental agencies, individuals, and interest groups, as appropriate. Publication of a Notice of Intent (NOI) in the *Federal Register* is not required. Informational letters were sent to those on the BLM Phoenix Field Office mailing list in March 2004 and a project update was sent in September 2004. In addition, APS conducted an informational open house and distributed a newsletter that included project information to residents and landowners within the study area. A project website and telephone information line number also were available for people to contact project team members. A detailed summary of the project public involvement program is provided in Chapter 5 of this EA.

# CHAPTER 2

## **CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES**

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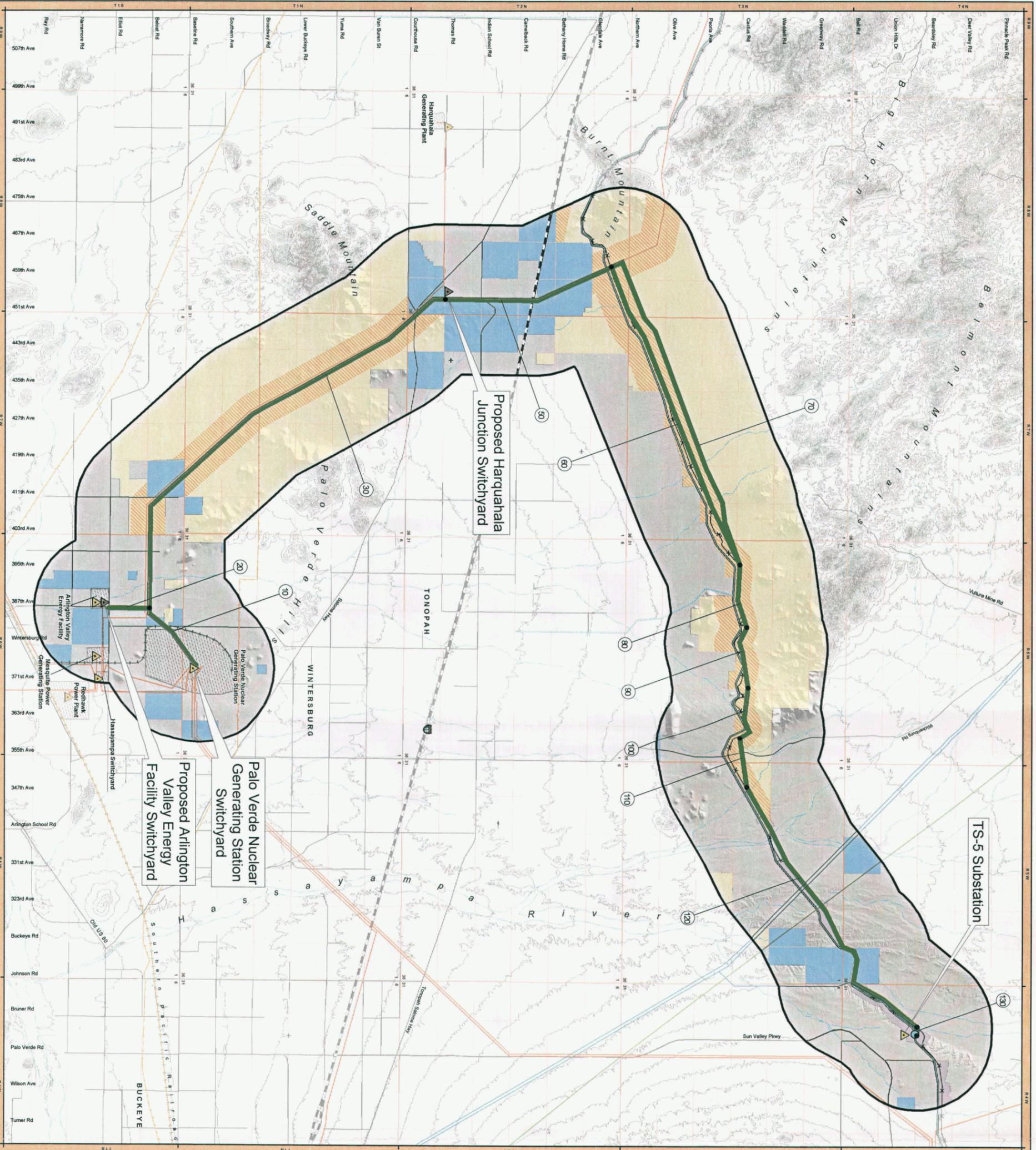
### **2.1 INTRODUCTION**

Chapter 2 describes the Proposed Action and No-Action alternatives, as well as alternatives considered and eliminated for the project. The Proposed Action is described initially and is followed by the options for the construction and implementation of the transmission line and a summary of associated pre-construction, construction, operation, and maintenance activities. A description of the No-Action alternative is then presented, followed by an explanation of alternatives to the proposed transmission line project that were considered and eliminated.

### **2.2 PROPOSED ACTION**

The Proposed Action involves the construction and operation of one single-circuit 500kV transmission line, and would originate from the PV Hub at either an open transmission interconnection position in the southern switchyard at the Palo Verde Nuclear Generating Station (PVNGS) Switchyard or a new 500kV switchyard to be constructed at the Arlington Valley Energy Facility Power Plant (Arlington Power Plant). The transmission line would connect into the TS-5 Substation generally located south of the Hassayampa Pumping Plant along the CAP Canal, west of 291<sup>st</sup> Avenue and north of the Beardsley Road alignment, as illustrated in Figure 2-1. Both options are currently being evaluated for system reliability and interconnection issues. The right-of-way for the project would be approximately 200 feet in width and approximately 42 to 44 miles in length.

From the PV Hub, the Proposed Action would be constructed with lattice tower structures and parallel to the north and east of the existing Palo Verde-Devers No. 1 transmission line within a BLM-designated utility corridor. At the intersection with the CAP Canal, the line would turn easterly and parallel the northern side of the CAP Canal within a BLM-designated utility corridor and would be constructed with lattice tower structures or tubular steel poles. Based on public comment, two alternate route alignments (Links 60 and 70) have been identified as part of the Proposed Action along the north side of the CAP Canal within the BLM-designated utility corridor between the Palo Verde-Devers No. 1 transmission line and the foothills of the Belmont Mountains. These alternate routes have been evaluated in order to compare the potential impacts of locating the transmission line route immediately adjacent to the BOR fence line on the north side of the CAP Canal or approximately ½ mile north of the CAP Canal. The Proposed Action would cross 26 miles of BLM-managed land before crossing into BOR, Arizona State Trust land, or private land east of Wickenburg Road. At this point, the line would be constructed using tubular steel poles and would parallel the CAP Canal across the Hassayampa River basin and into the TS-5 Substation. Land ownership in the study area is illustrated in Figure 2-1.



**PALO VERDE HUB  
TO TS-5 500KV  
TRANSMISSION PROJECT**

**Land Ownership**

**FIGURE 2-1**

- Legend**
- Bureau of Land Management
  - Bureau of Reclamation
  - Arizona State Trust Land
  - Private

**Reference Features**

- Study Area
- Proposed Action
- Existing/Permitted Switchyard/Substation
- Proposed Switchyard/Substation
- Link Number
- Link Node
- Designated Liability Center (RLM)
- Existing Power Plant
- 500kV Transmission Line
- 345kV Transmission Line
- 230kV Transmission Line
- Pipeline
- Hassejanga Pumping Plant
- Stream/Arroyo/Wash
- Airport/leaport
- Interstate
- Road
- Railroad
- Cyle Northern Fence Line
- Cyle Canal
- Canal

**Sources**

- Arizona State Land Department (2003).
- AZ Department of Transportation (2003).
- US Department of Transportation (2003).
- US Bureau of Land Management (2003).
- Bureau of Reclamation (2005).

April 29, 2005

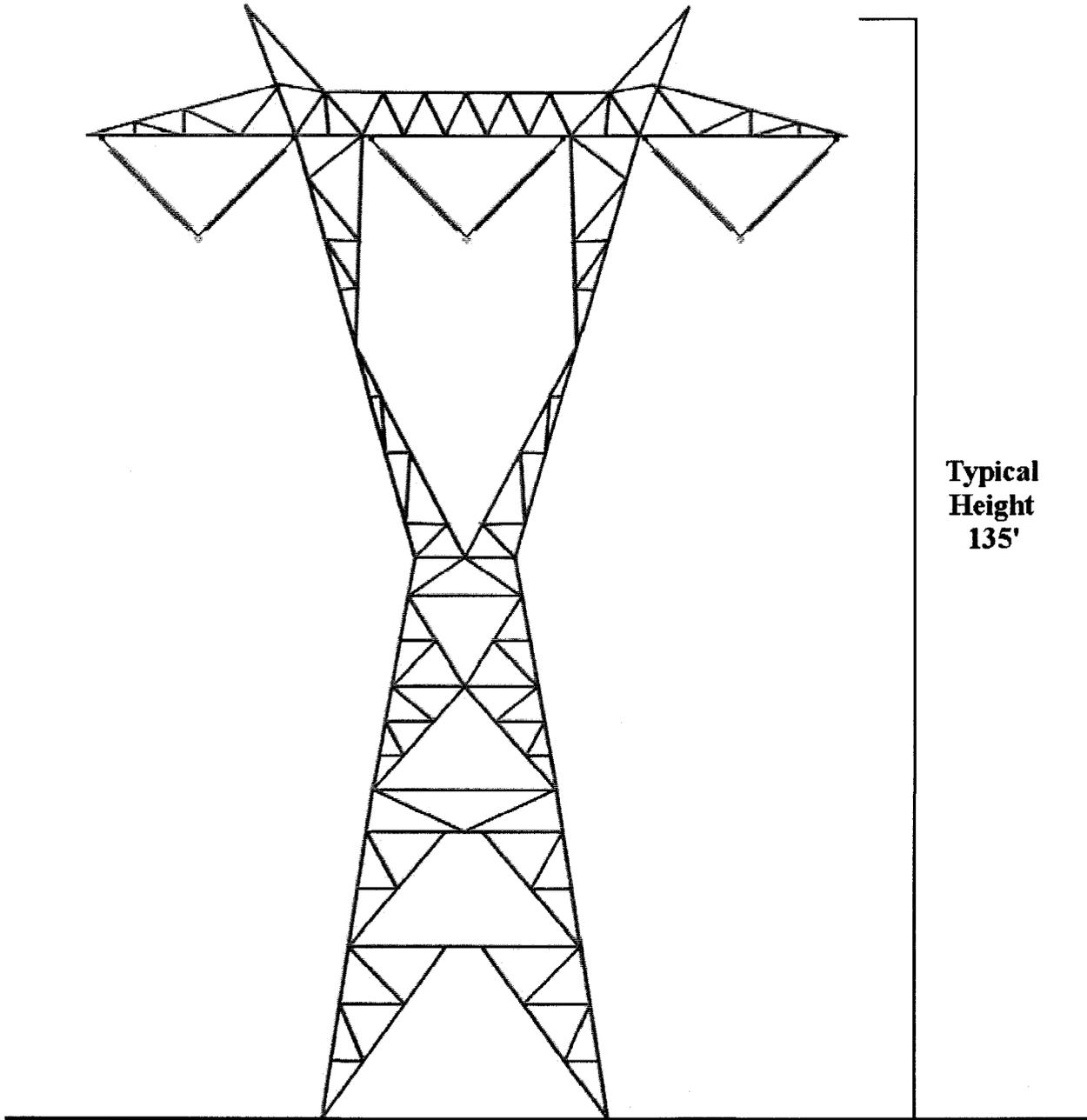


A series of system options also are currently under consideration by APS as described in Section 2.2.1. Depending on the system option selected, the Proposed Action may include a 500kV switchyard at the intersection of the Palo Verde–Devers No. 1 and Harquahala–Hassayampa transmission lines (located near Thomas Road west of 451<sup>st</sup> Avenue). This proposed switchyard is being referred to as the Harquahala Junction 500kV Switchyard (HJS). The final transmission line alignment and system configuration for the Proposed Action will be made based on the completion of APS' system and technical studies and the review and approval of one or more of these options by the ACC.

The 500kV transmission line would be designed for one 3-phase single-circuit (three bundles of three conductors) and two shield conductors, one of which would be stranded steel and the other a fiber optic line. The purpose of the fiber optic network is to provide one of two redundant communication and data paths between switchyards, generating stations, and the system control center. The fiber optics network will be part of the 500kV transmission line operation and control system. The fiber optics network will not be used as part of any commercial data or other communication systems. The structures proposed for the transmission line are both steel lattice and tubular steel pole, as shown in Figures 2-2 and 2-3. The structures would be approximately 130 to 150 feet above ground, depending on the span length required. The span length between structures would vary between 600 and 1,800 feet, according to terrain conditions, and achieve site-specific mitigation objectives such as matching structure locations with existing transmission lines. The steel lattice and tubular steel pole towers would have a dulled finish and conductors would have a low-reflective (non-specular), dulled finish to reduce visibility. In order to minimize impacts, structure selection and individual structure placement would be determined in the detailed design phase of the project. Structures will be constructed to conform to the Suggested Practices for Raptor Protection on Power Lines (Avian Power Line Interaction Committee 1996). In addition, structures will comply with Federal Aviation Administration (FAA) guidelines to minimize aircraft hazards (Federal Aviation 77 regulation).

The Arlington Power Plant and HJS switchyards (if constructed) would be 500kV facilities located on 20- and 40-acre sites, respectively. The TS-5 Substation would be a 500kV facility on an up to 80-acre site. The switchyards and substation will consist of several steel structures for line terminations and station bus conductor support. The structures and equipment will have a dulled finish similar to the transmission line towers as described above. The tallest station structure will be approximately 130 feet high. In addition to the electrical facilities, the switchyards and substation will include control, protection, and communication equipment. The station areas will be graded for water retention and covered in gravel. The colors for the facilities will be selected to blend in with the existing setting to the extent possible. A fence is proposed for the Arlington and HJS switchyard sites and a block wall will partially enclose the TS-5 Substation, with appropriate landscaping per jurisdictional code.

**Typical 500kV Single-Circuit Steel Lattice Structure**

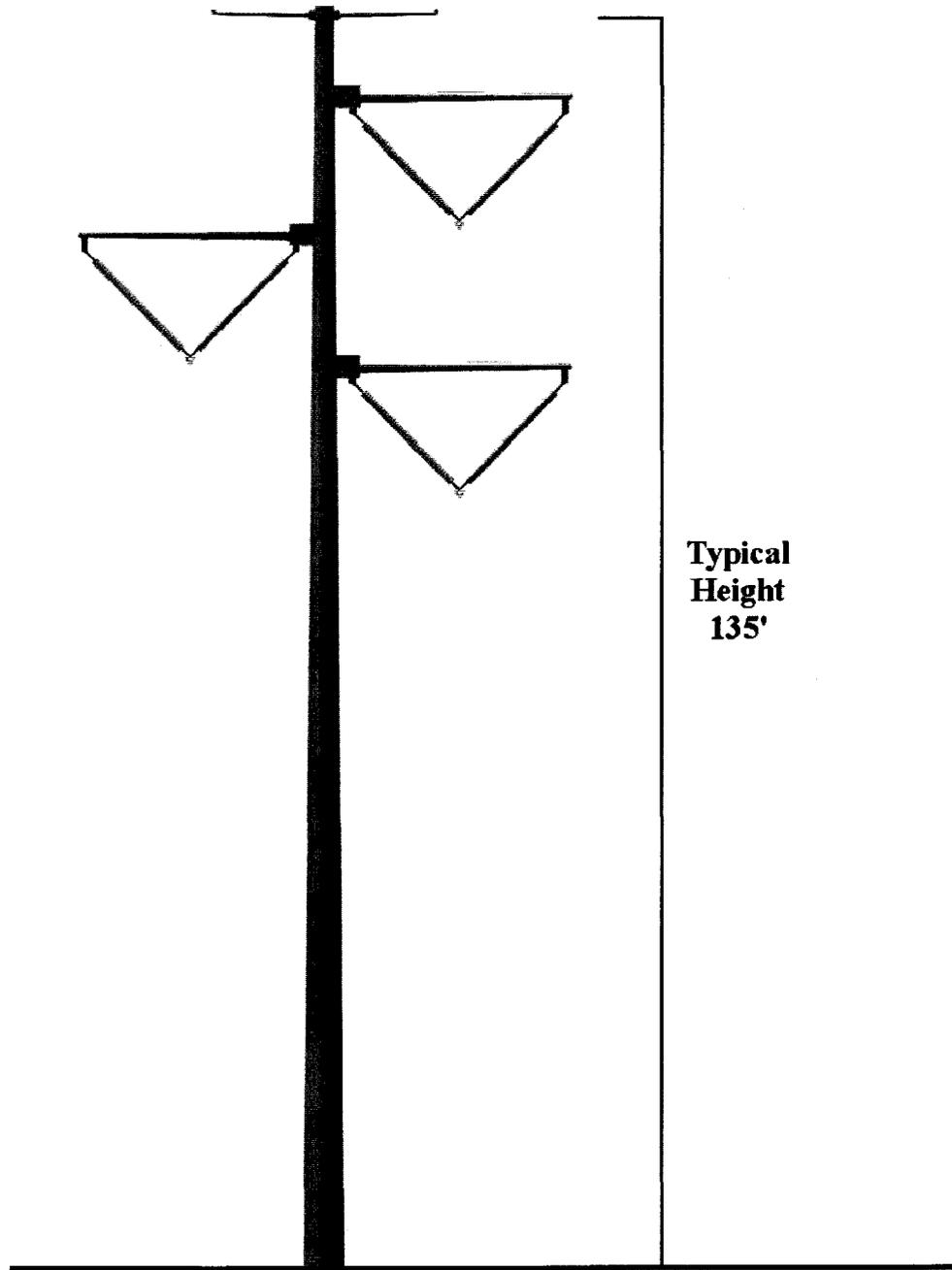


**Typical  
Height  
135'**

**Palo Verde Hub to TS-5 500kV  
Transmission Project**

**Figure 2-2**

**Typical 500kV Single-Circuit Tubular Steel Pole Structure**



**Typical  
Height  
135'**

**Palo Verde Hub to TS-5 500kV  
Transmission Project**

**Figure 2-3**

### **2.2.1 System Options**

The Proposed Action may be built in two phases depending on the system option selected. The first option is to build the Proposed Action in its entirety with a projected in-service date of Summer 2007. The second system option could be constructed in two phases with the second phase projected in-service in 2009 or later. The two options are detailed below.

#### **Option 1**

The Proposed Action would be constructed as one continuous project from the PV Hub to the TS-5 Substation. The in-service date for this option is projected for Summer 2007. The proposed right-of-way, as it affects public land, would be built within the Palo Verde–Devers Utility Corridor as identified in the RMP (1985) and the CAP Canal utility corridor as identified in the MFP (1994).

The HJS would not be built as part of this system option.

#### **Option 2**

The Proposed Action may be constructed in two phases if the project originates at the HJS. The first phase of this option would originate at the HJS and terminate at the TS-5 Substation, a distance of approximately 29 miles. The existing Harquahala–Hassayampa 500kV transmission line would be cut-in at the proposed HJS. The existing Harquahala–Hassayampa 500kV transmission line between the HJS and the PV Hub would be utilized until the second phase of the project is needed. The second phase of this option would consist of a new 500kV transmission line from the HJS back to the PV Hub and would be constructed when needed (expected in 2009 or beyond).

### **2.2.2 Construction Activities**

During the preconstruction phase, a specific Plan of Development (POD) would be prepared to include standard construction and operating procedures and mitigation measures (Appendix A), as well as a native plant survey and noxious weed plan for the project. These elements would be implemented throughout the life of the project in order to minimize potential environmental impacts. Construction of the proposed line would take place over an estimated 18- to 24-month period beginning as soon as possible in 2005. The 500kV line is projected to be in-service in the second quarter of 2007. A summary table of the project design characteristics is provided in Table 2-1.

**TABLE 2-1  
TYPICAL DESIGN CHARACTERISTICS**

Line Length	Approximately 42 to 44 miles
Type of Structures	Lattice tower and single steel pole
Structure Height	130 to 150 feet (maximum height of 195 feet for structures)
Span Length	600 to 1,800 feet
Number of Structures Per Mile	3 to 6
Right-of-Way Width	200 feet
Land Disturbed (approximate): <u>Temporary</u> structure wire-pulling, splicing sites <u>Permanent</u> structure	1½ acres to 4 acres (depending on structure type) ½ acre every 10,000 linear feet  Up to 100 square feet per structure
Access Roads	Use existing roads with new spur roads along the Palo Verde-Devers No. 1 line and upgraded or new access north of the CAP Canal
Voltage	500kV
Capacity	Up to 2,000 megawatts per circuit
Circuit Configuration	Single-circuit, bundled conductor
Conductor Size	1.00 to 1.75 inches
Ground Clearance of Conductor	32.5 feet minimum
Tower Foundation Depth	14 to 35 feet
Switchyards	500kV
Substation	500/230kV

Construction activities will include temporary access road construction, where required; clearing structure sites; digging holes; assembling and erecting structures; wire stringing; cleanup; and site reclamation. An estimate of the number of workers and type of equipment needed to construct the proposed transmission line and switchyards/substation are provided in Table 2-2.

### **Right-of-Way Acquisition**

New land rights will be required for the transmission line, switchyard(s), substation, and access roads to be obtained in the name of APS. A grant for rights-of-way with a width of 200 feet for the portions of the transmission line that would cross federal lands administered by BLM is being reviewed as part of the NEPA process. Non-federal lands necessary for the transmission line right-of-way and switchyards/substation sites would be obtained as easements or fee purchases. BLM receives right-of-way rental payments for those portions of the transmission line located on federal lands.

**TABLE 2-2  
TYPICAL TRANSMISSION LINE AND SWITCHYARD/SUBSTATION CONSTRUCTION**

<b>Estimated Personnel and Equipment Required</b>		
<b>Activity</b>	<b>Personnel</b>	<b>Equipment</b>
Right-of-Way/ Construction	8 people (including maintenance)	equipment: 2 bulldozers (D-6 or D-8) 1 motor grader 2 pickup trucks 1 water truck (for construction and maintenance)
Survey	3 people	equipment: 2 pickup trucks
Hole Digging	10 people	equipment: 2 hole diggers      2 pickup trucks 1 bulldozer (D-6)    1 backhoe 1 truck (2-ton)      2 dump trucks 1 water truck        2 wagon drills
Pole Haul	10 people	equipment: 2 pole haul trucks    2 pickup trucks 2 yard cranes (heavy duty) 1 water truck
Structure Erection	10 people	equipment: 1 crane (60 ton)      2 trucks (2 ton) 2 pickup trucks 1 water truck concrete trucks
Conductoring	25 people	equipment: 1 helicopter and fly ropes 3 drum pullers (1 light, 1 medium, 1 heavy) 2 splicing trucks 2 double-wheeled tensioners (1 light, 1 heavy) 6 wire reel trailers 2 diesel tractors 1 crane (20-ton) 1 drag 1 sagging equipment 4 trucks (5-ton) 6 pickup trucks 5 two-man lifts 1 water truck
Clean-up	4 people	equipment: 2 pickup trucks
Rehabilitation	4 people	equipment: 1 bulldozer (D-8)    1 pickup truck 1 motor grader
<b>Total Personnel Required</b>	<b>74*</b>	

\*More personnel may be utilized in order to meet schedule.

## Access Road Construction

Facility construction requires the movement of large vehicles along the right-of-way. Unpaved access roads will be required for the construction, operation, and maintenance of the proposed transmission line. Existing roads associated with the Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV transmission lines will be used where they provide adequate access to the proposed right-of-way along Links 10, 20, 30, 50, and a small portion of Link 70. Spur roads to the tower sites will be required in areas where the existing access is not sufficient to provide access to the proposed right-of-way. Typical permanent disturbance in these areas is estimated to be approximately ½ acre per mile of transmission line.

Improvements to existing two-track access roads will be needed in areas immediately adjacent to the CAP Canal fence line on the north side of the canal, associated with portions of Links 60, 80, 90, 100, and 110 as well as along the entire length of Links 120 and 130. Improvements to two-track roads would consist of blading, re-contouring, and vegetation clearing to allow for the passage of the equipment identified in Table 2-2. All other areas will require the development of new access to support construction equipment and activity. Typical permanent disturbance in areas of existing two-track roads is estimated to be 1.2 acres per mile of transmission line. In areas where new access will be required, it is estimated that 2.4 acres per mile of transmission line will be permanently disturbed.

Temporary road construction will include dust-control measures (i.e., watering roads) in sensitive areas. All existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line. All roads will be constructed in accordance with the applicant's requirements for transmission line access roads and would be consistent with the project standard construction and operating procedures and mitigation measures in Appendix A. Any roads or auxiliary features that have not been surveyed for cultural resources will need to be surveyed and evaluated to BLM standards.

## Structure Site Clearing

At each structure site, areas will be needed to facilitate the safe operation of equipment, such as construction cranes or line trucks. The area required for the location and safe operation of cranes and line construction equipment will be approximately 50 feet wide. At each lattice tower site, a temporary work area of approximately 1 acre will be required for the location of structures, assembly, and positioning of the structures. A temporary work area of approximately ½ acre will be required for those portions of the route where tubular steel poles will be used. The vegetation in the work area will be trampled, not cleared, unless approved by the BLM. After line construction, all areas not needed for normal transmission line maintenance will be graded to blend as nearly as possible with the natural contours and revegetated where required.

## **Clearing Right-of-Way**

The clearing of some natural vegetation will be required; however, selective clearing will be performed only when necessary to provide for surveying, electrical clearance, line reliability, and construction and maintenance operations. Topping or removal of mature vegetation under or near the conductors will be done to provide adequate electrical clearance as required by National Electrical Safety Code (NESC) standards.

No chemical treatment will be required along the right-of-way.

## **Foundation Installation**

Excavations for poles are made with power equipment. Where the soil condition permits, a vehicle-mounted power auger or backhoe is used. In rocky areas, the foundation holes may be excavated by drilling and blasting, or special rock anchors may be installed. Blasting requires drilling holes in the area to be excavated. Conventional or plastic explosives are used. Safeguards such as blasting mats may be used when needed to protect the adjacent property. After the hole is augured, poles will be set and backfilled with concrete. Remaining spoils material will be spread on the ground. The foundation excavation and installation requires access to the site by a power auger, crane, and hauling trucks.

## **Construction Yards**

An existing APS construction yard located in the Town of Buckeye will be used for material and equipment storage and construction management.

## **Structure Assembly and Erection**

Poles and tower components and associated hardware are shipped to each structure site by truck. Structure assembly and mounting of associated line hardware takes place at each site. The assembled structure is then raised and mounted to the foundation.

## **Conductor Installation**

After the structures are erected, insulators, hardware, and stringing sheaves are delivered to each structure site. The structures are then rigged with insulator strings and stringing sheaves at each ground wire and conductor position.

For public protection during wire installation, guard structures are erected over highways, railroads, power lines, structures, and other obstacles. Guard structures consist of H-frame poles placed on either side of an obstacle. These structures prevent ground wire, conductors, or

equipment from falling on an obstacle. Equipment for erecting guard structures includes augers, line trucks, pole trailers, and cranes. Guard structures may not be required for small roads; on such occasions, other safety measures such as barriers, flagmen, or other traffic control are used.

A pilot line is pulled (strung) from structure to structure by a helicopter, bulldozer, or all-terrain vehicle and threaded through the stringing sheaves at each tower. A larger diameter, stronger line is then attached to the pilot line and strung. This is called the pulling line. This process is repeated until the ground wire or conductor is pulled through all sheaves.

The ground wire and conductor are strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. Sites for tensioning and pulling equipment are approximately 10,000 feet apart and will be restored per the standard construction and operating procedures and mitigation measures after construction.

The tensioning and pulling site is an approximately ½-acre area. 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 and ground clearance is necessary to avoid damage to the ground wire, conductor, or any objects below them during the stringing operation. A puller, line trucks, and tractors, which are needed for pulling and temporarily anchoring the ground wire and conductor, also are located at this site.

## **Cleanup**

Construction sites, material storage yards, and access roads will be kept in an orderly condition throughout the construction period. Refuse and trash, including stakes and flags, will be removed from the sites and disposed of in an approved manner. No construction equipment oil or fuel will be drained on the ground. Oils or chemicals will be hauled to an approved site for disposal. No open burning of construction trash will occur on BLM-administered lands.

## **Reclamation**

Following construction and cleanup, reclamation will be completed. The disturbed surfaces will be restored to original contour of the land surface to the extent determined by the BLM. Water diversions will be constructed along the right-of-way as needed to control surface water and soil erosion. Access roads not needed for operation and maintenance will be closed. Appropriate site-specific seed mixes free of noxious weeds will be used where conditions vary. Salvaged native plants may be used for revegetation if appropriate, along with seeding using BLM-recommended seed mixes. Preferably, seed will be planted between November and January following transmission line construction. Seed will be planted as directed by the BLM.

## **2.3 ALTERNATIVES STUDIED IN DETAIL**

### **2.3.1 No-Action Alternative**

Under the No-Action alternative, the right-of-way application would not be approved and the transmission line would not be built. This alternative would not meet the project need.

## **2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY**

Several alternatives to the Proposed Action were analyzed in detail but eliminated from further study because they do not meet the purpose and need of the project. These alternatives included (1) energy conservation and load management, (2) new generation facilities, (3) transmission line technology, (4) underground transmission, (5) alternative structures, and (6) alternative routes and substation siting areas.

### **2.4.1 Energy Conservation and Load Management**

Energy conservation and load management refers to elimination of inefficient or imprudent uses of electrical energy and redistributing consumer's demand from times of peak demand to times of off-peak demand. APS has put into effect numerous energy-conservation and load management programs to educate customers on the necessity to conserve energy and to encourage the prudent use of electricity through the application of programs appropriate for each class of customer. In fact, potential reductions in system peak demand resulting from the load management program have been factored into APS' area load forecasts for over 25 years. Therefore, when compared to existing transmission capacity, the forecasts for additional conservation and load management demonstrate that despite effects of energy conservation and load management programs, a significant difference remains between existing capacity and projected demands. Also, since load conservation is a volunteered effort and therefore is not guaranteed, APS is required to plan their resources to actually meet projected peak loads. Therefore, energy conservation and load management were eliminated from further consideration.

### **2.4.2 New Generation Facilities**

Among the alternatives for meeting APS' need for additional power would be additional generating capacity. Adding generation capability was found not to be a reasonable alternative because of constraints of capital costs, environmental regulations, and lead time required to construct new generating facilities in relation to time-of-need. Also, APS and others have provided for sufficient energy to meet forecast needs in the northwest Phoenix metropolitan area through the development of generation facilities at the PV Hub. There is at least 6,000 megawatts (MW) of generation available at the PV Hub to meet existing and future electrical

load requirements; however, only additional transmission capacity is required to transfer the available generation at the PV Hub to the northwest Phoenix metropolitan area.

Other generation facilities including distributive energy, solar, and wind generation were evaluated as generation alternatives. As stated above, there is sufficient existing generation at the PV Hub to provide for the future electrical loads in the northwest Phoenix metropolitan area. Distributive energy, solar, and wind generation would not provide the required future electrical load for the northwest Phoenix metropolitan area. The proposed 500kV transmission line has the capability to transfer up to 2,000 MW of electricity, while the above-mentioned generation technologies rarely exceed 5 to 10 MW. To achieve the same level of generation found at the PV Hub would require excessive capital costs, and the environmental impacts associated with developing expansive wind or solar fields (over thousands of acres of land) would outweigh the benefits. For these reasons, alternative generation sources were eliminated from further consideration.

### **2.4.3 Transmission Line Technology**

Power-transfer capability is one of the most important factors in choosing the appropriate voltage for a transmission line. The industry standard for transmitting large amounts of power across long geographical areas is by using high voltage lines. The standard voltage for this region is 500kV. This voltage is more efficient and reduces line losses. A standard voltage of 500kV has been established for transmission of electricity from the PV Hub to the northwest Phoenix metropolitan area and is in accordance with the 10-Year Plan submitted to the ACC. Alternate voltages were investigated when designing systems in the 10-Year Plan. This proposed 500kV transmission line will provide bulk power to the proposed 230kV transmission system in the northwest Phoenix metropolitan area. Alternative transmission line voltages would not fulfill the purpose and need of the Proposed Action, and were eliminated from further consideration.

### **2.4.4 Underground Transmission**

APS recently investigated the applicability of 500kV high-voltage underground cable versus overhead transmission. This investigation included use, reliability, restoration time, ground disturbance, environmental considerations, and cost.

The design, manufacture, and installation of underground cable systems at a voltage level of up to 230kV are widely known. Past discussions with high-voltage cable manufacturers and review of previous installations indicate that installing underground 500kV cable and accessories for the distance and in portions of the terrain traversed by the Proposed Action would present significant cost, reliability, and maintenance concerns.

Design, manufacture, installation, and operation of long-distance 500kV underground transmission lines is still a learning experience in the industry due to limited operating history at this voltage level, and reliability issues for long-term operation remain unresolved. Repairing a

failed underground cable can take weeks or months due to the complexity of specialized cable, splices and equipment, and personnel required. Installation of underground tunnels and 500kV cable would result in major initial ground disturbances compared to overhead construction, although with proper reclamation techniques, some of this disturbance could be considered temporary.

For these reasons, the installation of 500kV cable circuits are not feasible as compared to the installation of overhead lines at this voltage level to meet the purpose and need identified in Chapter 1, and therefore eliminated from further consideration.

#### **2.4.5 Alternative Structures**

Two types of structures were considered for the proposed project: single-circuit lattice tower and single-circuit steel pole. The structure comparison was conducted according to criteria that included industry design practices, reliability, maintenance, material availability, costs, right-of-way, typical height, maximum span, and footprint requirements. Wood poles were not considered because they do not provide the strength necessary and height required to meet 500kV requirements. Steel lattice towers will be utilized from the origin of the proposed line at the PV Hub and in all areas where the line parallels the Palo Verde-Devers No. 1 line, thus matching the existing transmission line and reducing visual impacts. Steel lattice or tubular steel pole structures will be used on all BLM-managed lands on the north side of the CAP Canal. Tubular steel pole structures will be utilized on the remainder of the project on private lands or within the BOR right-of-way where the proposed transmission line will closely parallel the CAP Canal into the TS-5 Substation.

#### **2.4.6 Alternative Routes and Substation Siting Area**

The review process for the proposed facilities included environmental studies and public involvement activities conducted from December 2003 through January 2005. 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 two-phase systematic process.

The first phase was the determination of a project study area and development of siting criteria to identify potential alternative locations for the transmission line and substation facilities. The study area was approximately 630 square miles and included the Town of Buckeye, as well as the communities of Tonopah and Wintersburg. The study area included land administered by the BLM, BOR, Central Arizona Water Conservation District (CAWCD), as well as Arizona State Trust land and private land. The initial study area for the project was defined to include all reasonable and feasible alternative routes for the location of a 500kV transmission line extending from the PV Hub inclusive of the PVNGS and the associated transmission interconnection hub to the TS-5 Substation siting area along the CAP Canal. The PV Hub siting area was inclusive of the PVNGS; Pinnacle West Energy's Redhawk Power Plant (Redhawk), Sempra Energy

Resources' Mesquite Power Generating Station (Mesquite), and Duke Energy's Arlington facility and associated switchyards; and the Hassayampa Switchyard. The TS-5 Substation siting area was centered along the CAP Canal and included the Hassayampa Pumping Plant as well as an area immediately adjacent to the convergence of two of APS' Palo Verde-Westwing 500kV transmission lines (Palo Verde-Westwing) and WAPA's Mead-Phoenix 500kV transmission line.

In the second phase of the project, a regional inventory was conducted to identify environmental siting opportunities and resource sensitivity. The resources studied included biological, human, and cultural environments as well as technical considerations. This information was used to determine the location of alternative routes. To the greatest extent possible, routes under consideration utilized existing BLM utility corridors and available access, avoided biological and cultural resource conflicts, and avoided currently subdivided and densely developed residential lands. Approximately 200 miles of alternative transmission line routes and two alternative substation siting areas were identified and evaluated during this phase of the project. As a result of the analysis, one transmission line route, two switchyard interconnection areas, and one substation siting area were studied in detail in this EA as part of the Proposed Action described in Section 2.2.

The alternative routes that were considered and eliminated are described below according to their geographical location within the study area (e.g., western, central, and eastern alternative routes). Figure 2-4 illustrates the location of the alternative routes and substation siting areas considered and eliminated.

### **Western Alternative Routes**

A western-trending alternative route was identified that begins within the PV Hub siting area following to the north of the existing San Diego Gas & Electric (SDG&E) 500kV transmission line along the Southern Pacific railroad line. This route then turns northwesterly and follows along the north side of an El Paso Natural Gas pipeline across private, State Trust, and federal land. The portion of this alignment on federal land would be located within a BLM-designated utility corridor (utility corridor No. 1 from the RMP). In this area, another alternative route was identified that would parallel the west side of 411<sup>th</sup> Avenue before proceeding northwest along the alignment identified for the Proposed Action.

The western alternative route would then turn north and follow along the west side of Harquahala Valley Road on private land. At approximately Van Buren Street, the route would parallel the west side of an existing secondary canal across Interstate 10 (I-10) until it intersects with the existing Palo Verde-Devers No. 1 line. At this location, the route would turn easterly and would parallel to the south of the Palo Verde-Devers No. 1 line within a federally designated utility corridor (utility corridor No. 2 from the RMP). The route would parallel the 500kV transmission line until it intersects the CAP Canal and then follow the same alignment as identified for the Proposed Action to the TS-5 Substation siting area.



Another alternative route was identified that would follow the same alignment as described above but would turn easterly near Courthouse Road for approximately 3 miles. At the Harquahala Generating Plant (HGP), the transmission line would parallel the Harquahala–Hassayampa transmission line for approximately 5 miles and then follow the same alignment as identified for the Proposed Action to the TS-5 Substation siting area.

The western alternative routes were eliminated from further study because of land use, visual, and financial/environmental factors. The routes would have potential impacts to land use in residential areas along Harquahala Valley Road from acquisition of right-of-way.

In addition to potential impacts on land use resources, the routes would have potentially significant impacts to visual resources in residential areas along Harquahala Valley Road. The routes south of the CAP Canal would add new overhead transmission along a majority of the alignment in areas where no existing above ground facilities are currently located. With the exception of the portions of the alignment that would parallel the existing SDG&E, Palo Verde–Devers No. 1 transmission line or the Harquahala–Hassayampa transmission line, the remaining portion of the western alternative routes south of the CAP Canal would be new overhead construction that would not parallel any existing overhead facilities.

The third factor in eliminating the western alternative routes from further consideration is that they could be more than 20 miles longer than the Proposed Action, resulting in greater financial and environmental impacts.

### **Central Alternative Routes**

A series of alternative routes were identified that originate at the PV Hub and proceed generally north through the central portion of the study area. From the PV Hub, these alternative routes proceed north, paralleling the west side of Wintersburg Road to an area south of I-10. From this location a number of alternative routes were considered including a route that proceeds west along the south side of Encanto Boulevard to 395<sup>th</sup> Avenue, and then turns northerly and follows along the east side of the road to Camelback Road. At this point, the route would turn easterly and follow along the north side of Camelback Road to the intersection with a secondary canal near 387<sup>th</sup> Avenue. The route would then continue along the west side of the secondary canal to the CAP and follow the same alignment as the Proposed Action to the TS-5 Substation siting area.

Another alternative route was identified that paralleled I-10 to the south between 395<sup>th</sup> Avenue and Wickenburg Road. The route would then parallel the east side of Wickenburg Road to the CAP Canal and follow the same alignment as the Proposed Action to the TS-5 Substation siting area.

The central alternative routes were eliminated from further study because of potential impacts to land use and visual resources. The routes would have potential impacts to land use resources in residential areas north and south of I-10 from the acquisition of right-of-way.

The central alternative routes also would have potentially significant visual impacts to other residences adjacent to Wintersburg Road but not within the right-of-way. Other visual impacts to transportation views along I-10 would occur if the alternative route paralleling I-10 was selected. This alternative route would add new overhead transmission along the entire alignment in areas where no existing aboveground facilities are currently located. None of the central alternative routes south of the CAP Canal parallel existing overhead facilities and only those portions along the CAP Canal, the secondary CAP Canal, and I-10 would parallel facilities identified as opportunities in the siting criteria developed as part of the initial study previously described.

### **Eastern Alternative Routes**

A series of east-trending alternative routes were identified, all of which followed the same initial alignment from the PV Hub paralleling to the north of the existing Palo Verde–Westwing and Palo Verde–Rudd 500kV transmission lines. North of I-10, these routes would parallel the north and west side of the Palo Verde–Westwing 500kV lines across State Trust and private lands to Sun Valley Parkway. These routes would follow along the west side of Sun Valley Parkway where a series of alternative routes were considered and were generally associated with paralleling the WAPA Parker–Liberty 230kV transmission lines (Parker–Liberty), WAPA Mead–Liberty 345kV transmission line (Mead–Liberty), and Palo Verde–Westwing transmission lines in the area. Possible alternative routes included paralleling the north side of either existing 230kV or 345kV transmission lines to the CAP Canal and then following the same alignment as the Proposed Action to the TS-5 Substation siting area. Another alternative route in this area would parallel the existing Mead–Liberty transmission line until a point of intersection with an existing 230kV transmission line that terminates at the Hassayampa Pumping Plant and then following this alignment to the CAP Canal and the TS-5 Substation siting area. A final eastern alternative route was identified and paralleled the west side of the existing Palo Verde–Westwing transmission lines into the TS-5 Substation siting area.

The eastern alternative routes were eliminated from further study primarily because of two key engineering issues that would potentially impact system reliability. The first issue identified is the potential risk to the electrical grid at the PV Hub. The introduction of a fourth high-voltage transmission line to the existing Palo Verde–Westwing utility corridor significantly increases the potential of a corridor outage that could cascade into a grid-wide disturbance. A grid-wide disturbance would not only affect the PV Hub, but also the transmission lines that interconnect from the PV Hub (i.e., the Palo Verde–Rudd and Palo Verde–Westwing 500kV transmission lines).

A second issue is the potential for increased electrical outages in the Phoenix metropolitan area from an outage of multiple transmission lines within the same utility corridor. The addition of the eastern alternative route within the existing Palo Verde–Westwing utility corridor would add a fourth major bulk electrical transmission source serving the Phoenix metropolitan area within this utility corridor. This would increase the potential for large-scale electrical outages in the Phoenix metropolitan area.

In addition to the engineering considerations described above, environmental resource factors contributed to the decision to eliminate these alternative routes from further detailed study. The primary environmental issues associated with the eastern alternative routes are land use related. Residential development has occurred south of I-10 in the vicinity of Wintersburg in unincorporated Maricopa County. These routes would have potentially significant impacts to land use resources in residential areas south of I-10. Additionally, there is the potential for the disruption of existing commercial farming and nursery operations that are located adjacent to the existing right-of-way. Based on potential transmission line alignments and associated right-of-way acquisition, it is probable that these commercial farming and nursery operations could be disrupted or result in entire property take(s). The eastern alternative routes also would potentially impact residential development and views from residential areas on the north side of I-10.

### **PV Hub 500kV Interconnection Area**

The initial PV Hub siting area was defined by an area inclusive of the PVNGS; Redhawk, Mesquite, and Arlington power plants; and Hassayampa Switchyard as illustrated in Figure 2-4. Based on APS' review of system considerations and technical and financial issues, it was determined that an interconnection for the proposed 500kV transmission line into the Mesquite or Redhawk power plants, as well as the Hassayampa Switchyard, was not reasonable and eliminated from further consideration. Switchyard sites at the remaining two locations, the PVNGS Switchyard and Arlington Power Plant, were carried forward and studied in detail as part of the EA as described in Section 2.2.

### **Harquahala 500kV Interconnection Area**

The initial Harquahala 500kV Interconnection Area included a new 500kV transmission line into the HGP and/or the potential site of the HJS. This interconnection area was identified to incorporate the potential use of the Harquahala-Hassayampa 500kV transmission line from the Harquahala Junction to the PV Hub as a system option for construction of the Proposed Action and to provide for a potential secondary hub for bulk transmission within this portion of the APS service area. Based on APS' review of system considerations and technical and financial issues, it was determined that the interconnection into the HGP was not practical due to the potential abandonment of the 5-mile portion of the proposed transmission line. It was further determined that the HJS provides a system option for constructing the Proposed Action in two phases. The HJS was therefore carried forward and studied in detail as part of the EA.

### **TS-5 Substation Siting Area**

The initial TS-5 Substation siting area was centered along the CAP Canal and included the Hassayampa Pumping Plant as well as an area immediately adjacent to the convergence of the Palo Verde-Westwing 500kV transmission lines and the Mead-Phoenix 500kV transmission line.

Based on an analysis of future land use information available from the Town of Buckeye, portions of the land within this siting area have been identified for future residential development with an approved master plan by the Town of Buckeye. Based on discussions with the Town of Buckeye, construction of residential developments was expected to begin in the fourth quarter of 2004. Given the timeframe for the initiation of construction, potential impacts to future residential areas were anticipated. The TS-5 Substation siting area was refined to include a site in the western portion of the substation siting area, near existing industrial land uses associated with the Hassayampa Pumping Plant on the CAP Canal.

# CHAPTER 3

# CHAPTER 3

## AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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### 3.1 INTRODUCTION

The affected environment and potential environmental consequences are addressed in this chapter. This analysis evaluates the potential effects to the environmental resources from the construction, operation, maintenance, and long-term presence of the PV Hub to TS-5 500kV Transmission Project. The affected environment for the proposed route is often referred to as the "study area."

The following sections explain in detail the existing conditions found throughout the study area and the potential impacts of the proposed project. Impacts that could result from the project were determined by comparing the proposed project to the existing environment. The impacts are described as direct, indirect, or cumulative. The direct and indirect impacts are discussed in the individual resource sections in this chapter. The cumulative resource impacts are discussed in Chapter 4. The impact analysis is based on the inventory results and standard construction practices combined with professional judgment of the principal investigator for each environmental component. Within the environmental consequences portion of each resource section, general impacts to each resource are characterized initially according to the links common to both system options described in Section 2.2.1 of this EA. This includes Links 10 or 20, 30, 50, 60 or 70, 80, 90, 100, 110, 120, and 130. This is followed by a description of the potential impacts associated with the proposed Arlington Switchyard, the HJS, and the TS-5 Substation. No environmental impacts to the human, natural, or cultural environment are anticipated from the potential interconnection of the 500kV transmission line into the PVNGS Switchyard. The existing switchyard site has been highly modified by the PVNGS and associated electrical generation and transmission facilities; therefore, the interconnection into this facility is not described in detail in this chapter.

Standard construction and operating procedures and mitigation measures were utilized to minimize potential impacts to the project. These procedures and measures are discussed within each resource section, as applicable, and can be reviewed in Appendix A.

### 3.2 LAND USE

This section of the EA addresses land use resources including existing land use, utilities, transportation, rangeland management, minerals, recreation, and planned land use activities related to the construction, operation, and maintenance of the proposed transmission line and switchyard/substation facilities. Section 3.2.1 provides a description of the affected land use environment for the proposed project. Section 3.2.2 provides a description of the potential impacts to land use resources.

The study area for land use resources inventory was defined as a 4-mile-wide corridor (2 miles on each side of the reference centerline). Data were collected and updated between January 2004 and 2005. The land use inventory considered existing and planned land uses within the project study area and was compiled through the review and interpretation of secondary data such as existing maps, planning documents, field reconnaissance, and contacts with key federal, Arizona State Trust, and local land management and agency officials.

### **3.2.1 Affected Environment**

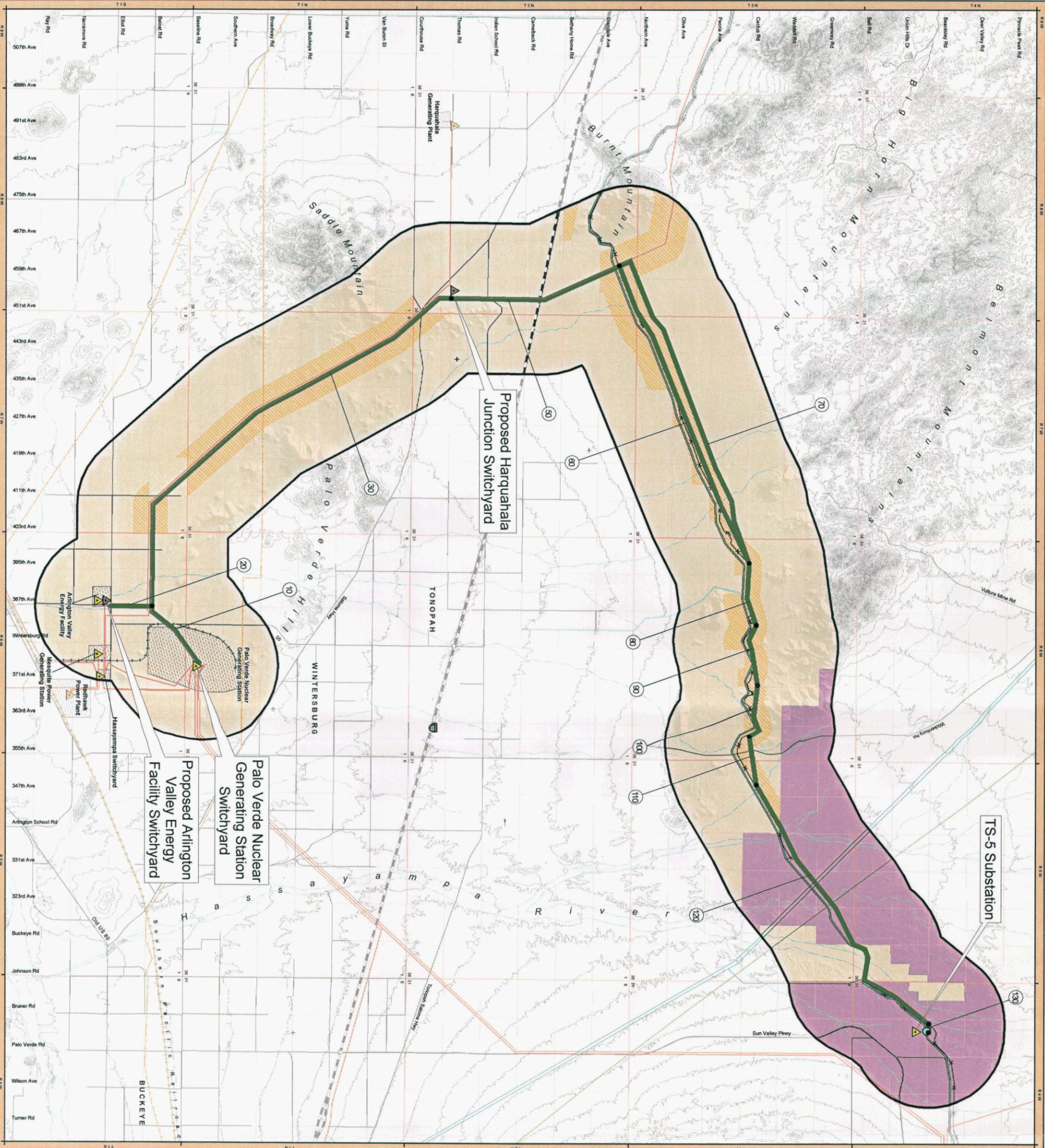
#### **Land Ownership and Jurisdiction**

Land ownership within the study area is shown on Figure 2-1 in Chapter 2 and includes BLM, BOR, Arizona State Trust land, and private land. BLM land is located in two main areas of the study area—the land near Saddle Mountain and the Palo Verde Hills south of I-10 along Link 30, and the land north of the CAP Canal and west of Wickenburg Road. Smaller areas of BLM land are interspersed throughout the study area. The BOR has right-of-way along the CAP Canal. The BOR has an easement from the BLM along Links 60, 80, 90, 100, 110, and portions of Link 120 and owns land in fee along Links 120 and 130. The largest sections of State Trust land are located in the vicinity of the PVNGS along Links 10 and 30, within the western portion of the study area near I-10 along Link 50, and in the northeastern portion of the study area along Link 120. Private land comprises the remainder of the study area.

The study area includes two jurisdictions, Maricopa County and the Town of Buckeye, as shown on Figure 3-1. The Town of Buckeye jurisdiction is in the eastern portion of the study area, and includes the TS-5 Substation site.

#### **Existing Land Use**

Existing land uses within the study area are shown on Figure 3-2. Residential land uses include single-family residences and low-density residential areas. In the southern portion of the study area, single-family residences are scattered adjacent to the PVNGS and along Elliot Road. West of Wickenburg Road, dispersed single-family residences occur south of the CAP Canal. Low-density residential areas with less than 1½ dwelling units per acre are located in two portions of the study area—approximately ½ mile north of the PVNGS and ½ mile north of the Salome Highway. A total of four residences were identified within 0-½ mile from the proposed transmission line.



**PALO VERDE HUB  
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**Jurisdiction**

**FIGURE 3-1**

- Legend**
- Unincorporated Maricopa County
  - Town of Buckeye

- Reference Features**
- Study Area
  - Proposed Action
  - Link Number
  - Link Node
  - Designated Utility Corridor (DUC)
  - Existing Power Plant
  - 500kV Transmission Line
  - 345kV Transmission Line
  - 230kV Transmission Line
  - Pipeline
  - Existing/Proposed Switchyard/Station
  - Proposed Switchyard/Station
  - Interstate
  - Road
  - Railroad
  - CAP Northern Fence Line
  - CAP Canal
  - Canal
  - Hasseyyanga Pumping Plant
  - Stream/Arroyo/Wash
  - Airport/Heliport

**Sources**

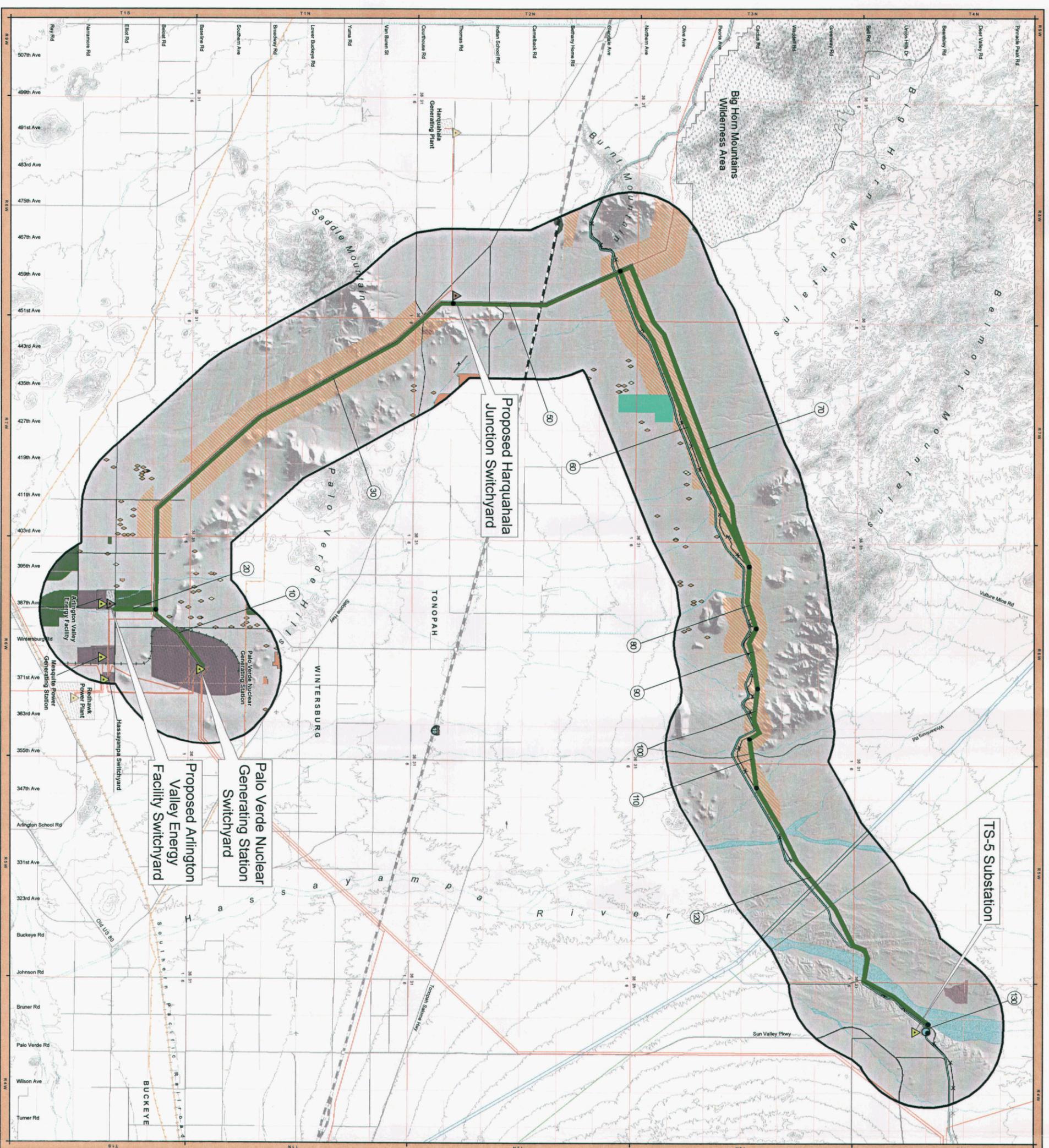
Arizona Department of Transportation (2003).  
 U.S. Department of Transportation (2003).  
 U.S. Department of the Interior (2003).  
 Maricopa County, Arizona (2005)

April 29, 2005

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Miles

**APS**

**epj**



**PALO VERDE HUB  
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**Existing Land Use**

**FIGURE 3-2**

- Legend**
- Low Density Residential
  - Single Residence
  - Abandoned Residential
  - Power Plant/Switchyard
  - Mining/Extraction
  - Airstrip
  - Rest Area
  - Agriculture
  - Vacant
  - River/Wash
  - BLM Wilderness
  - CAP Canal Facilities
  - Ground Water Recharge Facility

- Reference Features**
- Study Area
  - Proposed Action
  - Link Number
  - Link Node
  - Designated Utility Corridor (DLU)
  - Existing Power Plant
  - 500KV Transmission Line
  - 345KV Transmission Line
  - 230KV Transmission Line
  - Pipeline
  - Existing/Planned Switchyard/Substation
  - Proposed Switchyard/Substation
  - Interstate
  - Road
  - Railroad
  - CAP Northern Fence Line
  - CAP Canal
  - Canal
  - Hassejanga Pumping Plant
  - Stream/Arroyo/Wash
  - Airport/Heiport

**Sources**

US Bureau of Land Management (2003),  
 AZ Department of Transportation (2003),  
 US Department of Transportation (2003),  
 Maricopa Association of Governments (2000)

April 29, 2005

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**APS**

**epj**

Isolated parcels of irrigated agricultural land are located in the southern portion of the study area south of the Palo Verde–Devers Utility Corridor near Link 20; however, not impacts to prime farmland are anticipated. There are no areas of critical environmental concern, wild or scenic rivers, or national monuments designated in the study area.

## Utilities

The primary industrial land uses in the study area consist of utility operations including the PVNGS, Arlington and Mesquite natural gas-fired power plants (located south of the PVNGS along Elliot Road near Link 20). The Hassayampa 500kV Switchyard is east of the Mesquite Power Plant, along Elliot Road.

Several existing transmission lines, a natural gas pipeline, and the CAP Canal are located within the study area. Around the PV Hub, numerous 500kV transmission lines interconnect the generation stations and switchyards. From the PV Hub, the Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV transmission lines are located within the Palo Verde–Devers Utility Corridor and are parallel to a point approximately 2 miles north of Saddle Mountain, where the Harquahala–Hassayampa transmission line turns west to the Harquahala Generation Plant. Southern California Edison Company (SCE) has a BLM-authorized right-of-way adjacent to the Palo Verde–Devers No. 1 transmission line for the future Palo Verde–Devers No. 2 transmission line. The Palo Verde–Devers No. 1 transmission line continues north across I-10 and the CAP Canal within the BLM-designated utility corridor, and turns west around the north side of Burnt Mountain. An El Paso Natural Gas pipeline crosses the study area south of Saddle Mountain across Link 30.

East of Wickenburg Road and west of Sun Valley Parkway, the two Parker—Liberty 230kV transmission lines and the Mead–Liberty 345kV transmission line cross the study area and Link 120. Three 500kV transmission lines are located south and east of the TS-5 Substation site. The two Palo Verde–Westwing and the Mead–Phoenix 500kV transmission lines are located in this area.

In addition to the electrical transmission utilities located within the study area, the CAP Canal, managed and operated by the CAWCD, is located in the northern portion of the study area. The Hassayampa Pumping Plant, a facility designed to lift and convey large volumes of canal water, is located in the northeast portion of the study area along the canal (Link 130). The CAWCD is currently involved in the implementation of the Tonopah Desert Recharge Project (TDRP), a direct water recharge project located approximately 7 miles northwest of Tonopah and immediately south of Links 60 and 70. The facility will include 19 infiltration basins and will occupy an area of 541.8 acres adjacent to the south side of the CAP Canal. The project is estimated to begin full-scale operations in November 2005 (CAWCD 2004a).

## **Transportation**

I-10 is a principal arterial interstate (rural) and the most heavily traveled road in the study area (ADOT 2004). Other arterial roads in the study area include Wintersburg and Elliot roads near the PVNGS; Salome Highway and Sun Valley Parkway; and Wickenburg Road, which cross the CAP Canal. Sun Valley Parkway is referenced as a scenic roadway corridor in the Buckeye General Development Plan (Town of Buckeye 2001). An Arizona Department of Transportation rest area is located along I-10 in the far western portion of the study area, south of Burnt Mountain.

The only FAA recognized airfield in the study area is the Mauldin private airstrip, located approximately  $\frac{3}{4}$  mile north of the Salome Highway, east of the proposed HJS. This airstrip would not be crossed by the Proposed Action. The Luke Air Force Base (LAFB) Auxiliary Field #1 facility is located northeast of the TS-5 Substation outside of the project study area; however, a meeting was held with LAFB representatives to discuss the Proposed Action and any potential impacts to LAFB flight operations. LAFB representatives indicated that because the proposed structures to be utilized for the project will be less than 200 feet in height, no impacts are anticipated to their flight operations.

## **Minerals**

Two mineral material operations, a sand and gravel operation in the northern portion of the study area north of Link 120 and a Maricopa County decorative rock operation west of the Hassayampa River and along Salome Highway and Link 30, are located within the study area.

No active mining claims were identified on BLM sections crossed by the Proposed Action (Garret 2004). The Arizona State Land Department (ASLD) owns mineral rights to areas crossed by the Proposed Action, specifically within the area of Coyote Wash. No current state mineral leases or exploration permits were identified along the Proposed Action (ASLD 2004). The ASLD, Minerals Division has identified two pending mineral lease applications that are generally located in the northwest portion of Section 36 of Township 4 North, Range 5 West. Depending upon the location of the final engineered alignment of the proposed transmission line, a portion of Link 120 could cross a small portion of the proposed mineral lease area.

## **Recreation**

Dispersed recreation activities such as hunting, hiking, horseback riding, and off-highway vehicle uses occur on public lands along the proposed route and in the general area. The Big Horn Mountains Wilderness Area is located on BLM land approximately 2 miles north and west of the Proposed Action.

In July 2004, the Maricopa County Board of Supervisors approved the Maricopa County Regional Trail System Plan, which identifies future trail corridors throughout the county. The plan identifies corridors according to segments with a corresponding priority level. Three corridors identified in the plan are located within the study area including two portions of the CAP Canal and the Old Camp Wash in the northern and southern portion of the study area. The portion of the proposed Maricopa County Regional Trail (MCRT) or along the CAP Canal within the Town of Buckeye was identified as a Priority Three segment. Priority Three segments are identified as “regional corridors that are not key components of the regional trail system at this time, but may become important future trails” (Maricopa County 2004). The remaining portion of the corridor along the CAP Canal in unincorporated Maricopa County and the corridor along the Old Camp Wash were identified as Priority Four segments. These segments were identified as future trail corridors (5 miles wide) worthy of further study. According to Maricopa County Department of Transportation (MCDOT), there is 20 feet of space available from the BOR and CAWCD on the south side of the CAP Canal for potential trail development. MCDOT indicated that future trail development would therefore likely occur on the south side of the CAP Canal (Kempton 2004).

### Recreation Opportunity Spectrum

In the BLM planning process, Recreation Opportunity Spectrum (ROS) classifications are used to help set recreation themes within each of the BLM’s management areas. The majority of the BLM lands crossed by the proposed route occur within the Roded Natural category. The Roded Natural designation is given to areas typically characterized by a natural environment with moderate evidence of humans. A portion of the proposed transmission line route also would cross BLM lands designated as Semi-Primitive Motorized, associated with Saddle Mountain along Link 30, which are typically characterized by a predominantly unmodified natural environment of moderate to large size. Semi-Primitive Motorized areas crossed by the proposed route are located within the BLM-designated Palo Verde–Devers Utility Corridor where the proposed route would parallel two existing 500kV transmission lines.

### **Planned Land Use**

Planned land use for the study area is designated by jurisdictional entities and shown on Figure 3-3. The portion of the project that crosses BLM lands is located within the Phoenix South Planning Area (south of I-10) and the Bradshaw Foothills Planning Area (north of I-10). The BLM is currently in the process of updating the Phoenix South RMP and the Bradshaw Foothills–Harquahala RMP. The RMP provides a comprehensive framework for future management actions, uses, allocation of public land, and resources. The Phoenix South RMP is currently in the alternatives development phase and the Bradshaw Foothills–Harquahala RMP is in the impact analysis phase. Until these RMPs are completed, the *Lower Gila North Management Framework Plan* (BLM 1994) and the *Lower Gila South Resource Management*

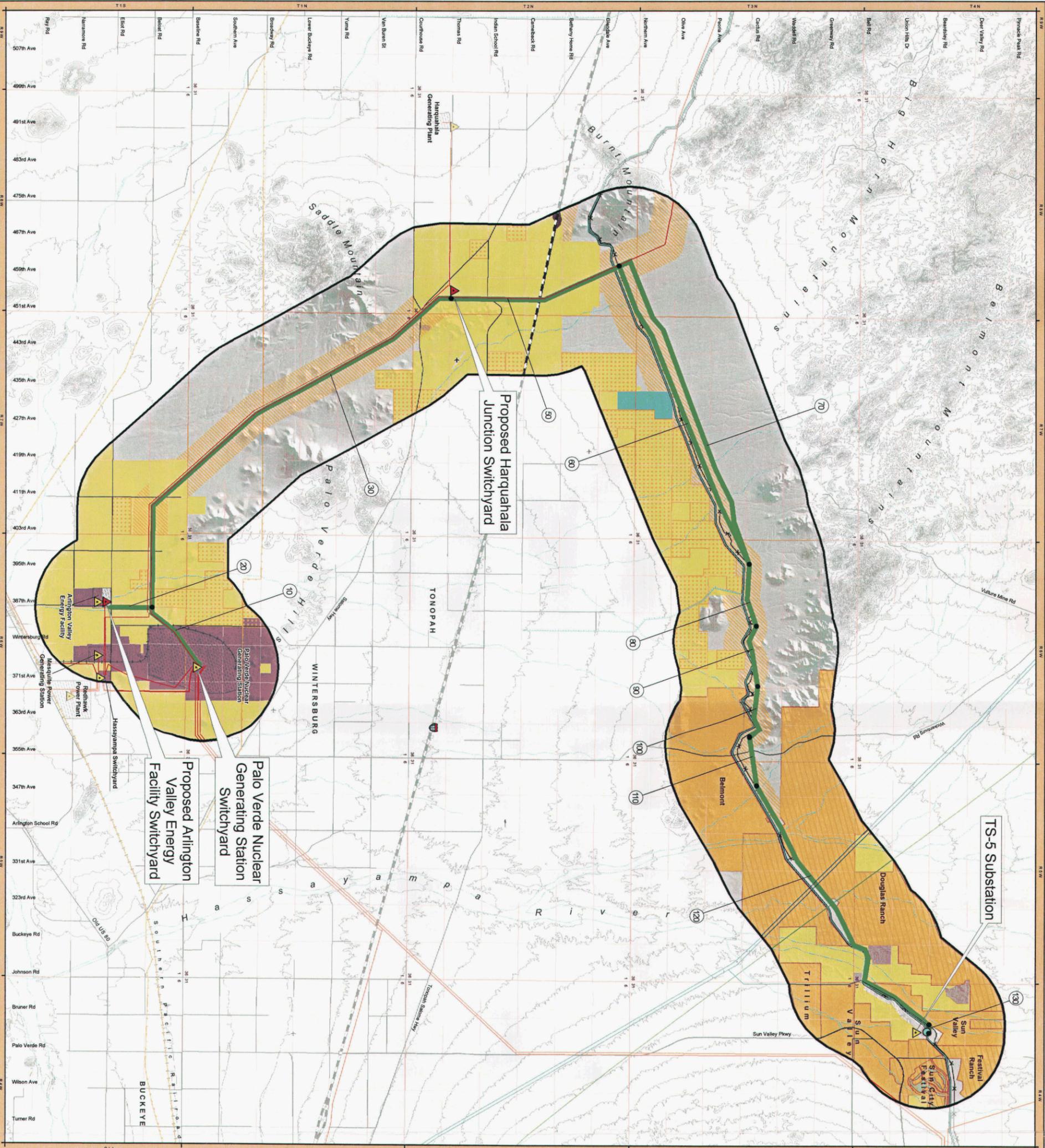
*Plan* (BLM 1985) remain the primary BLM planning guides for the portions of the study area north and south of I-10, respectively.

The current RMP identifies the Palo Verde–Devers Utility Corridor as one of ten “existing utility rights-of-way that should be designated to serve as utility corridors, and recommends that each of these corridors be 1-mile-wide” (BLM RMP 1985, p. 5). This corridor is referred to as No. 2 in the RMP. The CAP Canal Utility Corridor is a 1-mile corridor identified in decision LGN-MFP-3-L-2.1 of the Lower Gila North Management Plan (BLM 1994).

The future use of unincorporated private and State Trust lands is planned under the jurisdiction of Maricopa County. The *Maricopa County Tonopah/Arlington Area Plan* (Maricopa County 2000) provides for rural residential and industrial uses on the lands within the southern portion of the project study area. In the northern portion of the study area, the *Maricopa County 2020 Comprehensive Plan* (Maricopa County 2002) provides for rural residential land use. Within the unincorporated private land, Maricopa County has numerous approved platted subdivisions, which are developing at varying rates. These platted subdivisions are shown on Figure 3-3.

The Town of Buckeye incorporated town limit is approximately 1½ miles west of the Sun Valley Parkway as shown in Figure 3-1. The Town of Buckeye Planning Area boundary extends to approximately Wickenburg Road. The general land use designation within the Town of Buckeye Planning Area is “Planned Community.” This designation is intended to “accommodate all land uses approved as part of a community master plan, where specific uses, public services, densities, and design criteria have been identified and adopted” (Town of Buckeye 2001). Several master planned communities in the study area are located within the Buckeye town limits. Pulte/Del Webb owns property south of the CAP Canal, including Sun City Festival, which is located south of the CAP Canal and east of the TS-5 Substation. Sun City Festival has an approved community master plan and is in the process of having plats approved. Festival Ranch development is an approved community master plan, which spans the CAP Canal. The Douglas Ranch development also has an approved community master plan. Douglas Ranch is located west of the Hassayampa River on the north and south sides of the CAP Canal. Town of Buckeye properties in the study area that do not have approved community master plans include Sun Valley and Trillium.

The CANAMEX Corridor is a proposed north-south trade corridor defined by Congress in the 1995 National Highway Systems Designation Act that would include a continuous four-lane highway from Mexico City through Edmonton, Canada (CANAMEX 2004). In Arizona, the final CANAMEX route and alignment has not been determined but could include I-19 in Nogales to I-10 in Tucson, to Phoenix and US 93 (Phoenix) to Las Vegas (CANAMEX 2004). A portion of the CANAMEX corridor in Maricopa County could utilize an alignment inclusive of Wickenburg Road and Vulture Mine Road between Phoenix and Wickenburg, but a final decision has not been made (Maricopa Association of Governments 2004).



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**Planned Land Use**

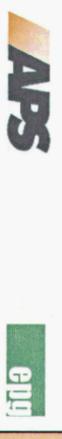
**FIGURE 3-3**

- Legend**
- Approved Community Master Plan
  - Platted Subdivision
  - Master Planned Community/Community Master Plan
  - Rural Residential/Planned Community
  - Industrial
  - Mining/Extraction
  - Airstrip
  - Rest Area
  - Vacant (BLM)
  - Golf Course, Parks, Preservation
  - CAP Facilities
  - CAP Ground Water Recharge Facility

- Reference Features**
- Study Area
  - Proposed Action
  - Link Number
  - Link Node
  - Designated Utility Corridor (DUC)
  - Existing Power Plant
  - 500kV Transmission Line
  - 345kV Transmission Line
  - 230kV Transmission Line
  - Pipeline
  - Existing/Proposed Switchyard/Substation
  - Proposed Switchyard/Substation
  - Interstate
  - Road
  - Railroad
  - CAP Northern Fence Line
  - CAP Canal
  - Canal
  - Hasseyampa Pumping Plant
  - Stream/Arroyo/Wash
  - Airport/Support

**Sources**

Maricopa County 2020 Comprehensive Plan, Revised August 7, 2002  
 Maricopa County 2020 Temporal/Air Quality Area Plan, Section 16, 2000  
 Town of Buckeye Land Use District Map, Updated January 19, 2004  
 Maricopa County GIS, Department  
 Arizona Department of Transportation  
 U.S. Department of Land Management  
 U.S. Bureau of Land Management



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### 3.2.2 Environmental Consequences

#### **Proposed Action**

It is anticipated that the proposed transmission line would have minimal long-term direct or indirect adverse effect on existing or planned land uses. The majority of the land crossed by the transmission line is vacant and located within a BLM-designated utility corridor. From the PVNGS, Link 10 crosses primarily vacant private land and a small parcel of State Trust land as it parallels the Palo Verde–Devers No. 1 transmission line. Link 20 crosses approximately 1 mile of vacant private land or agricultural land as it parallels section lines north from the Arlington facility. Duke Energy owns the land along Link 20 between the Arlington Power Plant and the Palo Verde–Devers No. 1 line. Links 10 and 20 cross general plan land use designated Rural Residential in the *Tonopah/Arlington Area Plan* (Maricopa County 2000). Along Links 30 and 50 the proposed transmission line crosses vacant land as it parallels the Palo Verde–Devers No. 1 transmission line.

From this point, Links 60, 70, 80, 90, and 100 would parallel the north side of the CAP Canal on vacant land within a BLM-designated utility corridor south of the Belmont Mountains. Link 110 crosses Wickenburg Road and Link 120 crosses two existing 230kV and one existing 345kV transmission line, and the Hassayampa River. Link 120 crosses the master planned communities of Douglas Ranch and Sun Valley. Direct impacts could occur to the Douglas Ranch and Sun Valley developments; however, because the proposed alignment (Link 120) parallels an existing linear feature (CAP Canal) and will not bisect the developments, impacts would be minimal. Link 130 is located at the eastern end of the proposed route and crosses near the Hassayampa Pumping Plant and into the TS-5 Substation. Structures for the transmission line will be located so that no obstruction to pumping station operations will occur.

Impacts to recreation in the study area are anticipated to be minimal. The proposed project is consistent with the objectives of the Roaded Natural category of the ROS. In areas along Link 30 where the proposed project crosses Semi-Primitive Motorized areas, the proposed transmission line would parallel the existing transmission lines, use existing access, and match tower structure locations to the extent possible to reduce impacts. A new access road associated with Link 70 would be developed in the Roaded Natural category of the ROS, which is consistent with management objectives for these areas. The Proposed Action is anticipated to have minimal to no impacts on recreational uses associated with the future MCRT. The proposed transmission line would be located on the north side of the CAP Canal within a BLM-designated utility corridor, and the portion of the trails which would parallel the CAP Canal would be located on the south side of the facility. No other plans exist to develop recreational facilities within the proposed right-of-way.

No impacts are anticipated to existing mining activity, current mineral lease or exploration permits on State Trust lands, or to active mine claims on federal lands. Minimal impacts to the pending mineral lease application with the ASLD, Minerals Division are possible if the lease is

approved and the final engineered alignment of the proposed transmission line crosses the subject parcel. APS is currently in discussion with the ASLD regarding the terms of the lease (if approved) to reduce potential impacts to both the mining operation and the operation of the proposed transmission line.

No impacts to the future CANAMEX Corridor are anticipated from the Proposed Action.

### Switchyards and Substation

Impacts to existing and future land use from the proposed Arlington Power Plant switchyard are anticipated to be minimal. The switchyard would be located on private land owned by Duke Energy for the Arlington Power Plant, which is identified in the *Maricopa County Comprehensive Plan* as an industrial land use (Maricopa County 2002).

Impacts to existing and future land use from the HJS are anticipated to be low. The proposed HJS would be located on vacant land northwest of the junction of the Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV transmission lines. Planned land use in this area is designated as Rural Residential in the *Maricopa County Comprehensive Plan* (Maricopa County 2002). There are no existing or planned developments in this area.

Impacts to existing and future land use from the TS-5 Substation site are anticipated to be low. The site is located on vacant private land south of the Hassayampa Pumping Plant and west of the proposed Pulte/Del Webb Sun City Festival development. Planned land use for the site is designated “Planned Community” by the Town of Buckeye.

### **No-Action Alternative**

Under the No-Action alternative, the project would not be constructed, no land use(s) would be affected, and no environmental consequences to land use(s) would occur; however, the purpose and need for the project would not be met.

## **3.3 VISUAL RESOURCES**

This section of the EA addresses visual resources including agency visual resource management classes, scenic quality, and key observation points (KOPs) and visibility related to the construction, operation, and maintenance of the proposed transmission line and substation/switchyard facilities. Section 3.3.1 provides a description of the affected visual resource environment for the proposed project. Section 3.3.2 provides a description of the potential impacts to visual resources.

The visual resource study was based upon the BLM's Visual Resource Management (VRM) System (BLM Manual 8410-1, January 1986) and addresses the potential visual effects of the proposed project on landscape scenic quality and sensitive viewers, and compliance with VRM classifications. The visual study included an inventory and assessment of visual resources within the study area for the Proposed Action. Data were collected 2 miles on either side of the centerline of the proposed route in order to characterize the visual resources in the study area. Inventory data for visual resources were collected from existing and future land use plans (see Figures 3-2 and 3-3), aerial photography, previous studies, BLM data, and field review. The visual resource inventory focused on the determination of scenic quality, identification of sensitive viewers, and viewing conditions within the study area.

Appendix B contains definitions for VRM classes, as well as visual simulations illustrating existing conditions and how the project will fit into the existing landscape setting.

### **3.3.1 Affected Environment**

#### **Project Setting**

The project study area is located within the Basin and Range Physiographic province in southwest Arizona (Fenneman 1931). The topographic character within the general study area can be described as generally flat with intermittent rolling hills in the southern portion of the study area with areas of bajada and foothills associated with the Belmont Mountains in the northern portion of the study area. A portion of the Palo Verde Hills adjacent to Saddle Mountain are crossed by the proposed project near the proposed HJS along Link 30. The proposed project also crosses the Hassayampa River and associated terrace lands.

The predominant vegetation character of the study area is representative of the Lower Sonoran Desert including saguaro, ocotillo, paloverde, ironwood, and creosote. Creosote and bursage are dominant plant species in the southeastern portion of the study area where saline soils are abundant. Xeroriparian washes supporting catclaw acacia, blue paloverde, and desert willow occur throughout the area as well, particularly along the north side of the CAP Canal.

Infrastructure/cultural modifications that affect the natural landscape setting include the PVNGS and ancillary facilities; Hassayampa Switchyard; Mesquite and Arlington power plants; I-10; CAP Canal (including structural berms and the Hassayampa Pumping Plant); and existing Palo Verde-Devers No. 1 and Harquahala-Hassayampa 500kV transmission lines and access roads. The CAP facility (canal, roads, flood control berm) and the two 500kV transmission lines are located within BLM-designated utility corridors on federal lands and would be paralleled by the proposed project. Additional modifications include three 230kV transmission lines (one of which is associated with the Hassayampa Pumping Plant), a 345kV transmission line, two additional 500kV transmission lines, and two mining operations. An El Paso Natural Gas pipeline and a mining operation are located in the central portion of the study area. Several 12kV distribution

lines are located in the northern and southern portions of the study area along roads and near residential areas. There are two areas of visual interest, including portions of Saddle Mountain and the Palo Verde Hills in the southern portion of the study area and the foothills of the Belmont Mountains north of the CAP Canal and west of Wickenburg Road. A very small portion of the Big Horn Mountains Wilderness Area is located in the northwestern portion of the study area, approximately 2 miles from the proposed transmission line route.

### **Agency Visual Resource Management Classes**

BLM VRM classes are assigned to lands managed by the BLM and provide acceptable levels of development within each class. VRM class designations are typically dictated by the scenic quality of the landscape, public concern for the maintenance of the scenic quality and KOPs and associated visibility, and agency management objectives (see Appendix B). VRM classifications can also be developed according to specific management prescriptions such as wilderness study areas or areas of critical environmental concern.

VRM classes were inventoried within the study area using Geographic Information System (GIS) data acquired from the BLM. The majority of land crossed by the proposed project is designated as Class IV (Links 30, 60, 70, 80, 90, 100, 110, and part of Link 120). Class III areas are generally associated with the land adjacent to I-10 but in these areas the proposed transmission line route would parallel similar existing facilities associated with the Palo Verde–Devers No. 1 transmission line (Link 50 and a portion of Links 30, 60, 70, and 100). Relatively small areas of Class II occur in the project area and are associated with moderate to high topographic relief landforms. These areas include the foothills adjacent to Saddle Mountain and the Belmont Mountains (parts of Links 30 and 100). A very small Class I area is located approximately 2 miles from the proposed project within the study area and is associated with the Big Horn Mountains Wilderness Area.

### **Scenic Quality**

Scenic Quality Rating Units (SQRUs) are used by the BLM to describe specific natural landscape types and cultural modifications found within the regional landscape. The designations are categorized into three classes—A (outstanding), B (above average), and C (common). The degree of diversity and variety of visual elements (i.e., landform, vegetation, color, etc.) associated with the previously described landscape character were used to derive the SQRUs along the proposed project.

A majority of the proposed route would cross Class C landscapes (Links 10, 20, 30, 50, 60, 70, 80, 90, 110, and 120), which are primarily associated with large expanses of creosote plants and little, if any, topographical features. Class C landscapes tend to lack color, landform, visual diversity, and include cultural modifications such as roads, pipelines, and utility facilities. Class

B landscapes that would be crossed by the proposed project are associated with the foothills in the vicinity of both Saddle Mountain and the Belmont Mountains, as well as desert washes which exhibit a greater diversity of vegetation than that of the surrounding landscape (Links 100 and 130 and portions of Links 30, 90, and 120). The Hassayampa River floodplain is considered a Class B landscape due to its topographic and vegetative diversity and also would be crossed by the proposed route. Other areas that were designated Class B and crossed by the proposed project include agricultural lands near the PV Hub, and isolated desert hills in the southern portion of the study area. Due to the topographical and vegetative diversity of Saddle Mountain and the Belmont Mountains, these landscapes were considered to have high scenic quality.

### **Key Observation Points and Visibility**

The inventory of KOPs included three components: (1) the identification of key viewers and visual sensitivity, (2) distance zones, and (3) viewing conditions.

KOPs, their associated viewers, and corresponding viewshed were identified through data gathered during field reconnaissance and aerial photograph interpretation. The sensitive viewers were organized into three categories, including residential, recreation, and transportation views, and are described below.

### Key Viewers and Visual Sensitivity

Numerous viewpoints and viewing areas associated with sensitive viewers were identified in coordination with land use investigations, including individual residences, communities, recreation areas, and transportation routes. Visual sensitivity reflects the degree of concern for change in the scenic quality of the natural landscape or to the visual image of the rural and residential settings. Visual sensitivity levels (high or moderate) reflect the type of viewpoint/viewer (residential, recreational, or travel) and viewer concern for change, volume of use, public and agency concerns, influence of adjacent land use, and viewing duration.

For the purposes of this project, high sensitivity viewers were associated with existing residential areas, the Big Horn Mountains Wilderness Area, and Sun Valley Parkway. Viewers within the Big Horn Mountains Wilderness Area were considered high sensitivity because of their concern for the maintenance of the natural and pristine landscape. Sun Valley Parkway is considered high sensitivity because of its scenic corridor designation (Town of Buckeye 2001). The residential areas were designated high sensitivity because of the long duration of their views and their concern for the maintenance of the natural landscape. Moderate sensitivity viewers were associated with the travel routes, dispersed recreational users, and future residential development identified to occur in the study area including approved development master plan, platted subdivision, master planned community, and rural residential designations. These areas have been mapped on Figure 3-3, Planned Land Use. The travel route viewers were identified as

having a moderate sensitivity due to the short duration of their views based on vehicular speed or the modest level of vehicular traffic associated with these routes.

### Distance Zones

The distance from the viewer to the proposed transmission line also was considered in the analysis. Typically, in the 0-½-mile range individual objects are seen in greater detail, whereas in the ½-2-mile range, objects are typically viewed in relationship to patterns rather than an emphasis on individual features. In areas where views are from 2 miles and more, landscapes are viewed as horizon lines and tones where atmospheric conditions often dominate. These ranges or distance zones are based on previous 500kV siting studies in similar settings.

### Residential Views

As noted in Section 3.2.1, residential development in the study area occurs near the PVNGS, along Elliot Road in the southern portion of the study area, near the Salome and Tonopah-Salome highways, south of I-10, and in areas south of the CAP Canal and west of Wickenburg Road. A total of four residences were identified within 0-½ mile of the proposed project and would have views of the proposed transmission line. One of the residences is located in the southern portion of the study area and has views of the existing Palo Verde-Devers No. 1 and Harquahala-Hassayampa 500kV transmission lines. The other three residences are located on the south side of the CAP Canal in the northern portion of the study area and have views of the existing CAP Canal.

The majority of private and State Trust lands are planned for future residential development as indicated in Figure 3-3. Future residential viewers within the study area are primarily associated with the Belmont, Douglas Ranch, Festival Ranch, Sun City Festival, Sun Valley, and Trillium proposed master plan community developments. Other future residential viewers may also be associated with platted subdivisions and lands designated as rural residential/planned community areas within Maricopa County and the Town of Buckeye.

### Recreation Views

There are no formally designated or defined trails, parks, or trailheads within the project study area; however, dispersed recreation viewers may be located in the foothills adjacent to Saddle Mountain (Link 30) and the Belmont Mountains (Links 60, 70 and 90), based on consultation with the BLM (Hanson 2004). The proposed route would not cross the Big Horn Mountains

Wilderness Area. The southern boundary of the wilderness area is approximately 2 miles northwest of the proposed transmission line route. As a result of these conditions, there would be only intermittent and modified views of the Proposed Action from the wilderness area. All other recreation within the study area is widely dispersed.

### Transportation Views

Travelers along I-10 would have views of the Proposed Action. An Arizona Department of Transportation rest area is located within the study area along I-10 although views of the Proposed Action are screened by topography. Travelers along I-10 would have views of the Proposed Action; however, these views would be modified by the existing Palo Verde-Devers No. 1 transmission line.

Other transportation routes that occur within the study area and would have views of the Proposed Action are Wintersburg Road, Elliot Road, the Salome and Tonopah-Salome highways, Courthouse Road, Sun Valley Parkway, and Wickenburg Road. Additionally, two unpaved vehicular crossings of the CAP Canal located in the northern portion of the study area were also identified. These roads were originally developed to access mine claims in the Belmont Mountains but have been used by recreation users to access both the Big Horn Mountains Wilderness Area and dispersed recreation in the Belmont Mountains (Hanson 2004).

### **3.3.2 Environmental Consequences**

The purpose of the visual impact assessment is to characterize and describe the level of visual modification in the landscape that could result from the construction, operation, and maintenance of the Proposed Action. Modification of the landscape is described in levels of visual contrast, which affects scenic quality, sensitive viewers, and compliance with VRM objectives, all of which have been introduced in Section 3.3. The potential contrasts resulting from the Proposed Action were assessed using a methodology based on the BLM's Contrast Rating System (BLM Manual 8431) and previous 500kV siting studies. The visual impact analysis considered contrast as a result of introducing new facilities to the existing landscape setting, access and potential vegetation clearing, and the presence of existing facilities (e.g., the CAP Canal, power plants, substations, and transmission lines), distance zones, and sensitive viewers.

#### **Visual Contrast**

Visual contrast is defined as the degree of perceived change that would occur in the landscape as a result of the construction, operation, and maintenance of the Proposed Action. Visual contrast typically results from (1) landform modifications that are necessary to upgrade and construct new access roads and tower pad sites; (2) removal of vegetation to construct roads and maintain

right-of-way and clearance zones associated with the conductors and towers; and (3) introduction of new structures in the landscape.

The visual contrast assessment was conducted by comparing landscape elements (form, line, color, and texture) of the existing landscape with the elements associated with the Proposed Action including new structures (towers, hardware, and conductors) and new or improved access. Changes in landform, vegetation, and structural contrast were evaluated and assigned degrees of change in contrast. A contrast evaluation was conducted to provide existing contrast conditions adjacent to the proposed transmission line route, which considered an existing 500kV transmission line corridor with one to two facilities included in the corridors and the CAP facility (berm, canal, and roads). The existing landscape contrast was then combined with the contrast associated with the proposed 500kV transmission line resulting in a baseline of project contrast.

Project contrast levels for this size project (i.e., approximately 50 miles), typically range from strong to weak; however, only weak, weak-moderate, and moderate project contrasts are expected to occur as a result of the construction, operation, and maintenance of the Proposed Action. Weak project contrast occurs where the proposed transmission line would parallel one or two existing 500kV transmission lines. This condition occurs from PVNGS to the intersection of the Palo Verde-Devers Utility Corridor and the CAP Canal located in the northwest portion of the project area (Links 10, 30, and 50). Weak-moderate project contrast occurs where the proposed transmission line will not immediately parallel existing facilities (CAP Canal and existing transmission line) but still be influenced by them. These conditions occur adjacent to Arlington Road and along the north side of the CAP Canal, respectively (Links 20 and 70). Moderate contrast levels occur where the proposed transmission line will immediately parallel the CAP Canal or cross the Belmont Mountains foothills (Links 60, 90, and 100).

Following are the characterizations and descriptions of visual impacts associated with KOPs, scenic quality, and VRM classes. For all impact discussions, future visual impacts are described after the existing visual impacts for each KOP. If an impact for a specific resource is not anticipated to occur, it will not appear in the text.

## **Proposed Action**

### Key Observation Points/Sensitive Viewers

Impacts to sensitive viewers based on project contrast are anticipated to occur from the Proposed Action. The use of dulled steel structures, matching existing spans and tower locations (where possible), use of non-specular conductors, utilization of existing access to the greatest extent possible, and rehabilitation of vegetation where applicable all contribute to the mitigation of visual impacts to KOPs.

The following characterization of impacts to KOPs has been organized by the type of KOP including residential, recreational, and travel routes. Appendix B contains a map of existing KOPs and the locations from which visual simulations for this project were produced (Appendix B, Figure B-1), as well as six simulations, from the points identified in Figure B-1, illustrating existing and simulated conditions (Appendix B, Figures B-2 through B-7).

### Residential Views

Impacts that may occur to residential viewers as a result of the construction, operation, and maintenance of the Proposed Action are anticipated to range from primarily low to moderate. These impacts occur because the residences are typically located over ½ mile from the proposed project. Additionally, the existing conditions adjacent to the residences have been locally modified by one to two existing 500kV transmission lines along the southern and central portion of the Proposed Action (Links 10, 20, 30 and 50), and the CAP Canal and flood retaining structure along the northern portions of the Proposed Action (Links 60, 70, 80, 90, 100, 110, 120, and 130).

Low-moderate impacts to a single residential viewer are anticipated along the portion of the Proposed Action that may interconnect with PVNGS (Link 10). In addition, low-moderate impacts are anticipated to two residential viewers within 1 mile of the portion of the Proposed Action that could interconnect with the Arlington Power Plant (Link 20); however, both of these links occur adjacent to existing modifications including two 500kV transmission lines (Link 10 and 20) and the Arlington and Mesquite power plants (Link 20). The presence of existing facilities reduces the overall impact of the Proposed Action.

The development of the Proposed Action along Link 60 could result in moderate impacts to residential viewers south of the CAP Canal primarily because of the close proximity of the Proposed Action to the viewers (0-½ mile) and a moderate project contrast. Figure B-2 in Appendix B depicts the Proposed Action from a residential viewpoint south of the CAP Canal with typical viewing conditions. Because the Proposed Action will parallel an existing dominant linear industrial facility (the CAP Canal) and could be screened by moderately dense desert vegetation and backdropped by the Belmont Mountains, impacts would be reduced.

Impacts associated with Link 70 are anticipated to be lower than Link 60, because of the additional distance of the proposed transmission line from the residential viewers south of the CAP Canal. Residential impacts anticipated along Link 70 include both low and low-moderate impacts. No residential viewers were located within 0-½ mile of Link 70. Low impacts are anticipated in areas where the project contrast was identified as weak-moderate and where residences are located over 1 mile from the Proposed Action. Low-moderate impacts are anticipated for residential viewers within ½-1 mile of the Proposed Action (see Figure B-3 in Appendix B). Impacts to residential viewers will be further minimized because their views would be screened by vegetation. Additionally, views of the Proposed Action would be intermittently

backdropped by the Belmont Mountains south of the CAP Canal. Furthermore, the proximity of the CAP Canal berm to residents within ½-1 mile of the Proposed Action becomes a screening element, reducing the visibility of the Proposed Action in this area.

Low-moderate impacts also may occur to a few residences within 2 miles south of Links 80 and 90; however, impacts to these residences will be minimized because a large landform and moderately dense vegetation occurs between several of the residences and the Proposed Action, which effectively reduces visibility. Moreover, the Proposed Action would directly parallel an existing visually dominant industrial feature (the CAP Canal) within a BLM-designated utility corridor.

Impacts to future residential viewers are anticipated to be low because the Proposed Action would directly parallel one to two existing 500kV transmission lines, a 230kV transmission line, and/or the CAP Canal.

### Recreation Views

Low to moderate impacts to dispersed recreation viewers are anticipated to occur as a result of the construction, operation, and maintenance of the Proposed Action. Typical conditions for viewers from the foothills adjacent to Saddle Mountain (Link 30) and the Belmont Mountains will be intermittent screened views of the Proposed Action, which result in a reduction of contrast. Furthermore, the Proposed Action will parallel existing visually dominant features, including one to two 500kV transmission lines and the CAP Canal, within a BLM-designated utility corridor. Figures B-4 and B-5 in Appendix B illustrate the Proposed Action from a superior viewpoint in an area used for dispersed recreation adjacent to the Belmont Foothills. Views of the Proposed Action from the Big Horn Mountains Wilderness Area are distant (2 miles or more) and partially screened by vegetation, which further reduces landscape contrast.

### Transportation Views

Impacts to moderate and high sensitivity travel route viewers will range from low to moderate. The existing 500kV transmission lines and the CAP Canal reduce the contrast of the Proposed Action. Furthermore, varied topography and vegetation results in a variety of viewing conditions (screening and backdropping) that reduce the visibility of the Proposed Action. Low impacts occur where a weak, weak-moderate, or moderate condition exists within a 0-½ mile, ½-1 mile, or 1-2 miles visibility threshold (distance zone), respectively. Moderate impacts occur where a weak-moderate to moderate condition exists within a 0-½ mile or a ½-1 mile visibility threshold (distance zone), respectively.

The following is a summary of impacts according to travel route.

*Wintersburg Road* – Impacts to viewers from Wintersburg Road within the vicinity of the PV Hub are anticipated to be low. Interconnecting to PVNGS (Link 10) will result in low impacts to viewers from Wintersburg Road because the Proposed Action will directly parallel an existing 500kV transmission line. Furthermore, impacts to viewers from Wintersburg Road are anticipated to be low because the Proposed Action will be at a perpendicular angle, reducing viewing duration. Interconnecting to the Arlington Power Plant (Link 20) could result in low impacts to viewers using Wintersburg Road. In this area, the Proposed Action will be located 1 mile from Wintersburg Road and adjacent to an existing 500kV transmission line.

*Elliot Road* – Impacts to viewers from Elliot Road within the vicinity of the PV Hub are anticipated to be low to low-moderate. Interconnecting to PVNGS (Link 10) will result in low impacts to viewers from Elliot Road because the Proposed Action will directly parallel an existing 500kV transmission line. Interconnecting to the Arlington Power Plant (Link 20) could result in low-moderate impacts to viewers using Elliot Road because the Proposed Action crosses Elliot Road ¼ mile west of the existing 500kV transmission line. Additionally, the Proposed Action is located approximately 1 mile north of Elliot Road and will parallel two 500kV transmission lines within a BLM-designated utility corridor (Link 30). This condition results in minimal contrast, reducing the visibility of the Proposed Action to travelers along Elliot Road. The occurrence of several power plants, transmission lines, and other existing visual features further reduces the contrast and identified impacts in this area.

*Salome/Tonopah-Salome Highway* – The Proposed Action will cross Salome/Tonopah-Salome Highway along Link 50. Impacts to the Salome/Tonopah-Salome highways are anticipated to be low because the Proposed Action will directly parallel two existing 500kV transmission lines. In the case of the Salome Highway, the Proposed Action will occur adjacent to a BLM-designated utility corridor. In addition, topography will intermittently screen views of the Proposed Action both east and westbound, thus further reducing impacts (Link 30).

*Courthouse Road* – Impacts to viewers along Courthouse Road are anticipated to be low because the Proposed Action will directly parallel one (Link 50) to two (Link 30) existing 500kV transmission lines. Additionally, topography will screen views of the Proposed Action, thus lowering impacts.

*Interstate 10* – The Proposed Action will cross I-10 along Link 50. Impacts to viewers from I-10 are anticipated to be low because the Proposed Action will parallel and match the spans of an existing single-circuit 500kV transmission line. Additionally, viewing duration and orientation (perpendicular to travelway) decreases the visibility of the Proposed Action from travelers using I-10, which results in a reduction of impacts. Figure B-6 in Appendix B depicts the Proposed Action as viewed by westbound travelers along I-10.

*Belmont Mountain Access Travel Routes* – Low-moderate impacts are anticipated to occur along Links 60 and 70 to viewers using the two unpaved CAP Canal crossings used as mountain access

travel routes. These impacts will be minimized because the Proposed Action will cross these routes at an approximately right angle, reducing the viewing duration.

*Wickenburg Road* – The Proposed Action will cross Wickenburg Road along Link 110. Impacts to viewers using Wickenburg Road are anticipated to be moderate. Figure B-7 in Appendix B depicts the views to northbound travelers. Topographical features will screen the views of southbound travelers within approximately 1 mile of the proposed transmission line crossing of Wickenburg Road. Additionally, the Proposed Action will cross Wickenburg Road at a perpendicular angle and the span of the transmission line will be maximized resulting in shorter viewing duration and reduced visibility of the towers, respectively. Additionally, low user volume associated with this travel route results in lower impacts. Link 110 also is located within a BLM-designated utility corridor.

*Sun Valley Parkway* – Impacts to travelers using Sun Valley Parkway (Link 120) are anticipated to be low because the Proposed Action will be located over 1 mile from viewers and will parallel an existing 230kV transmission line and the CAP Canal. Moreover, Sun Valley Parkway is a low-use, high-speed road, which results in reduced visibility and, therefore, reduced impacts.

### Scenic Quality

Low impacts to scenic quality will occur for the majority of the Proposed Action because the proposed transmission line will parallel existing 500kV transmission lines or the CAP Canal within BLM-designated utility corridors and within Class C landscapes. Moderate impacts are anticipated for small portions of the foothills adjacent to Saddle Mountain and the Belmont Mountains, and isolated areas of Class B landscapes where dense vegetation exists in the form of xeroriparian stringers, green-up areas adjacent to the CAP Canal, and in areas of moderate saguaro density (isolated areas along Links 30, 60, 70, 80, 90, and 100). However, these impacts will be minimized because the Proposed Action will parallel existing 500kV transmission line(s) or the CAP Canal within a BLM-designated utility corridor.

### VRM Compliance

The Proposed Action crosses primarily VRM Class III or IV landscapes and isolated Class II areas in the foothills adjacent to Saddle Mountain and the Belmont Mountains. Because the Proposed Action will parallel an existing transmission line or the CAP Canal, and is located in a BLM-designated utility corridor, the Proposed Action will comply with VRM objectives (see Appendix B). The Proposed Action does not cross any Class I landscapes.

## Switchyards and Substation

Low impacts are anticipated to viewers from a few isolated residences as a result of the construction, operation, and maintenance of the proposed Arlington Power Plant Switchyard. The impacts would be minimal because of the presence of several existing visually dominant elements including the Arlington Power Plant and its associated substation and a 500kV transmission line. Impacts to recreation viewers are not anticipated because there are no existing formally designated trails, trailheads, or recreational use areas in the vicinity of the proposed switchyard site. Low impacts are anticipated for travelers using Elliot and Wintersburg roads because the existing landscape has been locally modified by an existing switchyard associated with Arlington Power Plant, and existing transmission lines. Impacts to scenic quality will not occur because the land in which the substation would be built is developed.

No impacts to residential viewers are anticipated from the proposed HJS because there are no residences with direct views of the proposed switchyard. Potential impacts to recreational viewers associated with Saddle Mountain are anticipated to be low as a result of the construction and operation of the HJS. These impacts will be further reduced because the switchyard will be located in a BLM-designated utility corridor adjacent to two existing 500kV transmission lines. Low-moderate impacts from the proposed HJS are anticipated for viewers using the Salome Highway and Courthouse Road. Low impacts are anticipated for viewers using I-10. Figure B-8 in Appendix B depicts the proposed switchyard as seen by travelers using I-10. The impacts are anticipated to occur because travelers will have direct, unimpeded views of the proposed switchyard; however, by matching the spans and structure type of the existing 500kV transmission line (where possible) and constructing a fence around the proposed switchyard, the anticipated impacts will be minimized. Impacts to scenic quality from the proposed HJS are anticipated to be low because the facility would be located in a BLM-designated utility corridor in Class C scenery.

Low impacts are anticipated for future residential viewers and landscape scenic quality in the vicinity of the TS-5 Substation because the existing landscape is highly modified by the Hassayampa Pumping Plant, the CAP Canal, and an existing 230kV transmission line. Low-moderate impacts are anticipated for viewers of the substation from Sun Valley Parkway because the substation will be approximately ½-1 mile from road viewers and backdropped by the Hassayampa Pumping Plant and the CAP Canal.

### **No-Action Alternative**

Under the No-Action alternative, the project would not be constructed, no visual resources would be affected, and no environmental consequences to visual resource(s) would occur; however, the purpose and need for the project would not be met.

## 3.4 CULTURAL RESOURCES AND NATIVE AMERICAN CONCERNS

This section of the EA addresses cultural resources and Native American concerns including the results of the records review and intensive pedestrian surveys completed in support of the project related to the construction, operation, and maintenance of the proposed transmission line and switchyard/substation facilities. Section 3.4.1 provides a description of the affected cultural resources environment for the proposed project. Section 3.4.2 provides a description of the potential impacts to cultural resources and Native American concerns.

A cultural resource study consisting of a detailed records review and an intensive pedestrian survey was conducted in support of the Proposed Action (Luhnow and Darrington 2004). The study was conducted to determine whether any historic sites and structures or archaeological sites were in the vicinity of the proposed project and how they might be affected by the construction of the project. This study was undertaken to support the preparation of the EA, the BLM's compliance with the National Historic Preservation Act, and the ASLD's compliance with the Arizona State Historic Preservation Act.

The total acreage surveyed was 2,326 acres, 1,247 acres of which were on lands under the jurisdiction of the BLM Phoenix Field Office, 394 acres of lands under the jurisdiction of the BOR, 402 acres of private land, and 283 acres of lands under the jurisdiction of the ASLD.

### 3.4.1 Affected Environment

#### **Records Review Results**

The detailed records review identified a total of 41 previously conducted cultural resource studies, 68 previously recorded sites, and one State Historic Preservation Office (SHPO)-determined eligible archaeological district as occurring within 1 mile of the Proposed Action. The 68 previously recorded sites identified by the record review as occurring in the project's 1-mile study area include the following:

- Thirty-seven prehistoric sites, including a trail, grinding slabs, petroglyphs, lithic scatters, ceramic scatters, and sites exhibiting multiple artifact classes.
- Six historic sites including historic artifact scatters without associated structural remains, historic properties such as homesteads, roads, or labor camps, and historic mining sites.
- Seven sites classified as isolated rock features, such as rock rings, alignments, or "hearths."
- Sixteen prehistoric or historic sites that fall within the boundaries of the proposed Jagow Well/Palo Verde Hills Archaeological District, including trails, petroglyphs, hunting blinds, rock alignments, one intaglio, and artifact scatters.
- No further information is available for two additional sites. These sites are not in the area of potential effect (APE) of the Proposed Action.

Of the 68 previously recorded sites identified by the records review, 22 were identified as potentially occurring within the project APE. A total of 15 of those sites could either not be relocated within the APE or no longer exist within the APE because of previous data recovery.

The single archaeological district identified by the detailed records review is the proposed Jagow Well/Palo Verde Hills Archaeological District. The proposed Jagow Well/Palo Verde Hills Archaeological District was first recognized during surveys undertaken by the Museum of Northern Arizona in support of PVNGS (Trott 1974a, 1974b). Sites found within the proposed District include trails, petroglyphs, hunting blinds, rock alignments, one intaglio, and artifact scatters. The time of use established on the basis of ceramic types present at sites in the proposed District is between AD 900-AD 1150 and AD 800-AD 1900. The earlier dates of use are held to be associated with the Hohokam, while the later dates of use are held to represent Yuman utilization of the area.

The proposed Jagow Well/Palo Verde Hills Archaeological District has been determined eligible for listing on the National Register of Historic Places (NRHP) by the SHPO under Criterion C for Design/Construction, based on the numerous petroglyphs present there; as well as under Criterion D, for data potential (Landon 1980). However, the proposed District has not been submitted for listing, and is not currently listed on the NRHP.

That portion of the proposed Jagow Well/Palo Verde Hills Archaeological District that potentially falls within the APE along Link 10 is in the buffer zone of the district, and crosses site AZ T:9:48 (ASM). AZ T:9:48 (ASM) is a historic artifact scatter that is recommended as not eligible for listing on the NRHP. Intensive survey of that portion of the District that potentially falls within the APE of Link 10 identified no additional cultural resources.

### Intensive Pedestrian Survey Results

The intensive pedestrian survey for the Proposed Action identified 6 newly recorded sites (Table 3-1), 84 isolated occurrences (IOs), and revisited 7 previously recorded sites that occurred within the APE.

A list of those previously and newly recorded sites located within the APS is presented in Table 3-1 below.

<b>Site number</b>	<b>Recording Status</b>	<b>Jurisdiction</b>	<b>Description</b>	<b>Eligibility</b>
AZ S:12:35 (ASM)	Newly Recorded	BLM Phoenix Field Office	Prehistoric artifact scatter consisting of five flaking stations	Not Eligible
AZ S:12:36 (ASM)	Newly Recorded	BLM Phoenix Field Office /ASLD	Historic mining site	Eligible

**TABLE 3-1  
SUMMARY OF SITES LOCATED WITHIN THE APE**

Site number	Recording Status	Jurisdiction	Description	Eligibility
AZ S:12:37 (ASM)	Newly Recorded	Private	Historic artifact scatter	Not Eligible
AZ T:5:25 (ASM)	Newly Recorded	BLM Phoenix Field Office	Prehistoric Hohokam artifact scatter	Not Eligible
AZ T:9:86 (ASM)	Newly Recorded	Private	Prehistoric Hohokam ceramic scatter	Not Eligible
AZ T:9:87 (ASM)	Newly Recorded	Private	Prehistoric Hohokam ceramic scatter	Not Eligible
AZ S:12:32 (ASM)	Re-recorded	BLM Phoenix Field Office	Historic mining site	Not Eligible
AZ T:9:12 (ASM)	Re-recorded	BLM Phoenix Field Office	Prehistoric rock feature with associated lithics	Eligible
AZ T:9:13 (ASM)	Re-recorded	BLM Phoenix Field Office	Three rock rings (disturbed) of unknown age	Not Eligible
AZ T:9:21 (ASM)	Re-recorded	Private	Prehistoric artifact scatter with features	Eligible
AZ T:9:48 (ASM)	Re-recorded	Private	Historic artifact scatter	Not Eligible
AZ T:9:64 (ASM)	Re-recorded	BLM Phoenix Field Office	Prehistoric lithic and ceramic scatter	Eligible
AZ T:9:65 (ASM)	Re-recorded	Private	Historic homestead	Eligible

IOs 30, 58, and 65 represent potentially reconstructable ceramic vessels. IO 30 is located along Link 30, IO 58 is located along Link 80, and IO 65 is located along Link 70.

### **3.4.2 Environmental Consequences**

#### **Proposed Action, Switchyards, and Substation**

The intensive pedestrian survey conducted in support of the proposed project resulted in the identification of 6 newly recorded sites, 84 IOs, and the revisiting of 7 previously recorded sites.

In addition to the sites identified by the intensive pedestrian survey, IOs 30, 58, and 65, which are potentially reconstructable ceramic vessels, were identified. It is recommended that these vessels be collected for possible reconstruction prior to the commencement of construction of the Proposed Action.

The extreme southeastern corner of the proposed Jagow Well/Palo Verde Hills Archaeological District potentially falls within the project APE, along Link 10. This portion is in the southeast corner of the proposed District and crosses one site, AZ T:9:48 (ASM). This site is a historic artifact scatter, and is recommended as not eligible for listing on the NRHP. Intensive survey of that portion of the proposed District that potentially falls along Link 10 identified no additional cultural resources.

It may be possible to avoid all the NRHP eligible sites by spanning through careful positioning of the tower locations. If avoidance is possible, the Proposed Action would have no effect to historic properties. If avoidance of those sites that are recommended as eligible for inclusion on the NRHP is not possible, a treatment plan would be developed and implemented.

In addition, cultural resource avoidance monitoring during construction is recommended when ground-disturbing activities occur within 500 feet of a NRHP eligible site. This will help minimize the potential for any indirect impact to cultural resources.

### **No-Action Alternative**

Under the No-Action alternative the project would not be constructed, no cultural resources would be affected, and no environmental consequences would occur; however, the purpose and need for the project would not be met.

## **3.5 BIOLOGICAL RESOURCES**

This section of the EA addresses biological resources including vegetation, wildlife, and special status species related to the construction, operation, and maintenance of the proposed transmission line and switchyard/substation facilities. Section 3.5.1, Affected Environment provides a description of the affected biological resources environment for the proposed project. Section 3.5.2, Environmental Consequences provides a description of the potential impacts to biological resources.

Secondary data were collected 2 miles on either side of the centerline of the proposed route in order to characterize the biological resources in the study area. The information included the results of a literature search, secondary data from the BLM, review of previous studies conducted in the area of the Proposed Action, and field visits conducted during February, June, and August 2004. Field visits were performed for reconnaissance purposes only and did not include any species-specific surveys.

A list of sensitive species present in the area was compiled utilizing the United States Fish and Wildlife Service (USFWS) endangered species Internet site (TESS), information provided by the Arizona Game and Fish Department (AGFD) specific for the Proposed Action (AGFD 2004a), and the AGFD Heritage Data Management System (HDMS) Internet site (AGFD 2004b). This list, as well as a site plant list, are included in Appendix C of this document.

### 3.5.1 Affected Environment

The study area is located within the Lower Colorado River Valley Subdivision of the Sonoran Desertscrub biome, as described by Turner (1982). Almost all of southwestern Arizona below about 3,500 feet is located in this biome (Shreve and Wiggins 1964; Turner 1982). The Sonoran Desert is characterized by rather abrupt mountain ranges of low-moderate height surrounded by aprons of low-profile erosional bajada slopes, which occasionally drain to interior closed basins. Elevations within the general study area vary from approximately 890 to 1,500 feet. Annual precipitation for the study area (Tonopah, Arizona) typically averages 7.5 inches (Canty and Associates 2004) in a bimodal rainfall regime of gentle winter rains and the summer monsoon season where isolated thunderstorms and showers occur in July and August. Runoff within the study area flows to the Hassayampa River, Centennial Wash, and other drainages that ultimately discharge into the Gila River to the southeast.

#### Vegetation

The Lower Colorado River Valley Subdivision characteristically covers broad alluvial valley floors and is usually dominated by creosote bush (*Larrea tridentata*) in association with white bursage (*Ambrosia dumosa*) on gravelly soils, and with big galleta grass (*Pleuraphis rigida*) on finer textured soils. Approximately 83 percent of the proposed right-of-way would cross creosote bush/bursage habitat.

Washes that dissect valley bottoms of creosote bush scrub support a mixed scrub series, which includes blue paloverde (*Parkinsonia florida*), ironwood (*Olneya tesota*), mesquite (*Prosopis* spp.), and several species of shrubs where soils are coarse and rocky. Washes may be dominated by more shrubby species such as white burrobrush (*Hymenoclea salsola*) and sweetbush (*Bebbia juncea*). Approximately 13 percent of the proposed right-of-way would cross the mixed scrub series habitat.

Within the study area, approximately 3 percent of the proposed right-of-way crosses saltbush habitat (*Atriplex* sp.) along Links 20 and 30. Saltbush habitats are characterized by an extreme aridity. They may exist either as a product of their topography, climate and/or soil morphology (xerophytic type) or as a result of the chemical properties of their soil (halophytic type) (Turner 1982).

In the foothills on the south side of the Belmont Mountains (Links 90 and 100), some reasonably well-developed communities of foothill paloverde (*Parkinsonia microphylla*), ironwood, and saguaro are present that are almost wholly restricted to drainages, including the smallest runnels, rather than being evenly distributed over the bajada. Between the drainageways the landscape is dominated by a creosote bush and bursage (*Ambrosia* spp.) community with concentrations of teddybear cholla (*O. bigelovii*), buckhorn chollas (*O. acanthocarpa*), and hedgehog cactus (*Echinocereus engelmannii*). Vegetation on the interfluvials is minimal in some areas where the

desert pavement is well indurated, and often only rigid spiny herb (*Chorizanthe rigida*) and a few buckwheat (*Eriogonum* sp.) plants are found.

A blue paloverde community is present in several xeric drainages at the east end of the project (along Link 120), primarily the Hassayampa River, and Jackrabbit, Star, and Daggs washes. In these areas, blue paloverde is the dominant tree species, with burrobrush present as a co-dominant. Approximately 1 percent of the proposed right-of-way crosses blue paloverde habitat.

During the original construction of the CAP Canal, conduits for runoff waters were incorporated into the canal structure to allow waters draining off the south slopes of the Belmont Mountains to bypass the canal. However, other drainages for which bypasses were not constructed periodically capture and hold runoff waters. The result is that green-up areas have developed at several points along the north side (upslope) of the CAP Canal. These areas support increased plant species diversity and density due to the additional impounded water available. Tree species present in the green-ups, in order of prevalence are blue paloverde, velvet mesquite (*Prosopis velutina*), catclaw acacia (*Acacia greggii*), and ironwood. None of the green-up areas appeared to support any invasive tamarisk (*Tamarix* sp.) trees. The dominant shrub species in many of the green-up areas is desert broom (*Baccharis sarothroides*).

#### Wetlands and Other Water Sources

There are no wetlands within the study area, and there are no natural perennial water sources of any kind within the proposed right-of-way. Artificial water bodies that have permanent water are limited to the open portions of the CAP Canal, which is fenced in its entirety and is not generally accessible to wildlife except birds. There also are three large settling ponds at the PVNGS that contain no emergent vegetation and would not be attractive to waterfowl except possibly as a stopover during migration. All other surface hydrologic features consist of seasonally intermittent xeric washes. The transmission line crossing of the Hassayampa River is approximately 20 miles downstream of the perennial flowing portion of the river.

#### Rangeland Health

The BLM land within the study area includes several grazing allotments including the Carter-Herrera, Ward, Turner, Bialac, Flat Iron, and Douglas allotments. The Turner and Bialac allotments are ephemeral, while the other allotments are perennial (Lambeth 2004).

#### Invasive Species (Noxious Weeds)

No noxious weed species were observed during the four site visits performed in February, June, and August 2004.

## Wildlife

### Mammals

The mammalian fauna of the project study area is dominated by species of small, nocturnal rodents and bats including several species of pocket mice and kangaroo rats. Big game species present include desert bighorn sheep (*Ovis canadensis mexicana*), mule deer (*Odocoileus hemionus*), and javelina (*Pecari tajacu*). Carnivores likely present include coyote (*Canis latrans*), gray fox (*Vulpes macrotis*), badger (*Taxidea taxus*), bobcat (*Lynx rufus*), and two or more species of skunks.

### Birds

Due to a general lack of dense vegetation that provides cover and nesting habitat, there are fewer bird species present in the Lower Colorado Subdivision of the Sonoran Desertscrub biome than other biomes. Turner (1982) lists only LeConte's thrasher (*Toxostoma lecontei*) as representative of this subdivision. Birds observed or documented during field visits in 2004 included the following:

- Northern harrier (*Circus cyaneus*)
- red-tailed hawk (*Buteo jamaicensis*)
- American kestrel (*Falco sparverius*)
- Gambel's quail (*Callipepla gambelii*)
- great horned owl (*Bubo virginianus*)
- Gila woodpecker (*Melanerpes uropygialis*)
- Say's phoebe (*Sayornis saya*)
- Abert's towhee (*Pipilo aberti*)
- black-tailed gnatcatcher (*Polioptila melanura*)
- loggerhead shrike (*Lanius ludovicianus*)
- common raven (*Corvus corax*)
- verdin (*Auriparus flaviceps*)
- canyon wren (*Catherpes mexicanus*)
- cactus wren (*Campylorhynchus brunneicapillus*)
- black-throated sparrow (*Amphispiza bilineata*)
- house finch (*Carpodacus mexicanus*)
- phainopepla (*Phainopepla nitens*)

Green-up areas may be more attractive to wildlife, particularly species of birds, because of the denser vegetation and seasonally available water that is present in these locations.

## Reptiles and Amphibians

The only reptiles observed during site visits in 2004 were the zebra-tailed lizard (*Callisaurus draconoides*) and common side-blotched lizard (*Uta stansburiana*). Sonoran population desert tortoises are known to be present in some areas within the study area and are described under the special status species section. Amphibian species would be very limited, but spadefoot toads are likely to be present and would be active during the summer rainy season. The Great Plains toad (*Bufo cognatus*) and spadefoot toads (*Spea* spp. and *Scaphiopus* spp.) may be present in the green-up areas, and Woodhouse's toad (*B. woodhousii*) could be present in any irrigation waters available in the area.

## Fish

Due to the lack of naturally occurring permanent surface water sources in the vicinity of the Proposed Action, no fish species are present except for several non-native species of fish in the CAP Canal that have their origin in the Colorado River watershed. Additional fish species could include any warm water aquarium fish that have been released in canals that are fed by CAP Canal waters where fish control structures are not in place.

## Invertebrates

The Squaw Peak talussnail (*Sonorella allynsmithi*) is known only from the type locality in northeast central Phoenix. Suitable habitat for the Maricopa tiger beetle (*Cicindela oregona maricopa*) is not present within the study area.

## **Special Status Species**

Information regarding special status species within the project study area was requested and received from the AGFD. A review of threatened, endangered, or other sensitive species that are known to occur in Maricopa County identified 11 species that are either known to be present, or could occur within the limits of the general study area. Two additional species, the Yuma clapper rail (*Rallus longirostris yumanensis*) and the Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), were listed in the AGFD project letter; however, the study area for the Proposed Action does not support habitat for these two species. There are no proposed or designated critical habitats within the study area (AGFD 2004a).

## Federally Listed Species

### Cactus Ferruginous Pygmy-Owl (*Glaucidium brasilianum cactorum*)

The cactus ferruginous pygmy-owl is federally listed as an endangered species and is a wildlife species of concern in Arizona (AGFD 2004b). There are historical records of the ferruginous pygmy-owl occurring in the vicinity of the study area, but no recent records in portions of the project study area where marginal habitat elements (primarily saguaros and large paloverde trees) are present.

### Bald Eagle (*Haliaeetus leucocephalus*)

Breeding bald eagles are present in Arizona primarily along the Salt and Verde rivers. Other breeding pairs occur along other waterways in the state including the Little Colorado, Bill Williams, Agua Fria, Gila, and San Pedro River drainages (Hunt 1998; Wheeler 2003). In winter hundreds of additional bald eagles come south to Arizona to spend the winter. Most of these eagles winter in the Mogollon Rim area and particularly are associated with some of the lakes near Flagstaff, and the lower Salt and Verde rivers (Hunt 1998). Bald eagles generally remain near these reservoirs and waterways, and would be unlikely to be present in the open desert areas through which this project passes.

## Other Species of Concern

### Bats

Four sensitive species of bats could occur within the study area: the California leaf-nosed bat (*Macrotus californicus*), cave myotis (*Myotis velifer*), pale Townsend's big-eared bat (*Plecotus townsendii pallescens*), and pocketed free-tailed bat (*Nyctinomops femorosaccus*). The presence of abandoned mineshafts and adits from historic mining activity in the vicinity of the proposed transmission line route could provide suitable roosting habitat for some of these species.

### Other Mammals

Other sensitive mammal species that are known or are likely to be present within the project study area include the desert bighorn sheep (*Ovis canadensis*) and feral burro (*Equus asinus*).

Although the populations in the study area have no protective status, the desert bighorn sheep is considered to be particularly important to most state and federal land management agencies because of their status as a game species and their limited distribution. The proposed right-of-way would pass through an area of habitat for bighorn sheep in the southern end of the Belmont

Mountains that consists of a grouping of small disjunct hills at the southern periphery of the larger area of bighorn sheep habitat in the core of the mountains (Links 80, 90, and 100). There are currently very few bighorn sheep in the Big Horn/Belmont Mountain complex (Henry 2004). Because there is very little discontinuous, steep escape terrain in this area, use of the southern end of the Belmont Mountains by bighorn sheep is likely very limited. Bighorn sheep could be present to utilize water and forage at green-ups along the north side of the CAP Canal or the water guzzler that is present in the area. There is no known current use of the White Tank Mountains by bighorn sheep (Henry 2004), so it would be unlikely that bighorn sheep would occur within the study area east of the Belmont Mountains.

There are currently approximately 15 to 20 bighorn sheep utilizing Saddle Mountain, and these bighorn sheep may have become established from populations in the Gila Bend Mountains to the south (Henry 2004). If suitable forage were available in the Palo Verde Hills, the bighorn sheep would have to cross the proposed right-of-way to get from Saddle Mountain to that area. Bighorn sheep movements from Burnt Mountain south towards Saddle Mountain are probably precluded by the presence of I-10, and bighorn sheep can easily move north from Burnt Mountain into the Bighorn Mountains, and from there east into the Belmont Mountains.

The only herd of burros in the study area is a remnant herd associated with the Harquahala Mountains.

#### Birds

In addition to the cactus ferruginous pygmy-owl, two other sensitive bird species that could potentially occur within the study area are the American peregrine falcon (*Falco peregrinus anatum*) and the Western burrowing owl (*Athene cunicularia hypugaea*).

Because of its wide-ranging habits and records of occurrence near Phoenix, the peregrine falcon could occasionally be present in the study area. Suitable habitat for burrowing owls is probably present in several areas along the proposed right-of-way, and they could potentially occur almost anywhere within the study area. They are known to be present at the artificial burrow site project at the Redhawk (Clark 2001).

Other birds such as osprey (*Pandion haliaetus*), and piscivorous waterfowl such as mergansers and the Western Grebe (*Aechmophorus occidentalis*) could feed on many of the fish species found in the CAP Canal.

## Reptiles

Two sensitive species of reptiles, the Sonoran population desert tortoise (*Gopherus agassizii*) and the common chuckwalla (*Sauromalus ater*), may be present within the study area, although none were observed during site visits (Pape 2004).

For BLM lands in Arizona, desert tortoise habitat is divided into three categories, ranging in importance from Category 1 to 3, based on criteria for maintaining and protecting desert tortoise habitat. There is no Category 1 habitat within the study area. Approximately 6 miles of Category 2 habitat is present in the area between Saddle Mountain and the Palo Verde Hills along Link 30. Approximately 6 miles of Category 2 habitat also is present along Links 60, 70, 80, 90, and 100. Approximately 2½ miles of the proposed transmission line right-of-way would pass through BLM Category 3 desert tortoise habitat in the foothills of the Belmont Mountains north of the CAP Canal along Links 60, 70, 100, and 110. The presence of suitable habitat does not indicate a known presence of desert tortoises in these areas, but only indicates that potential habitat is present (Hughes 2005).

Habitat for chuckwallas is present in several areas along Link 30 where the transmission line route skirts the foothills of the Palo Verde Hills, Saddle Mountain, a small group of hills northeast of Saddle Mountain, and particularly at the southeastern corner of the Belmont Mountains along Links 80, 90, and 100.

### **3.5.2 Environmental Consequences**

This section of the EA addresses potential impacts to the biological resources from the construction, operation, and maintenance of the transmission line and related facilities. Potential biological resource impacts and concerns may include (1) the loss of vegetation during construction, (2) effects to wildlife, and (3) impacts to special status species, in particular to the Sonoran population of the desert tortoise and desert bighorn sheep. This section provides an assessment of impacts for the study area and biological elements considered in the inventory and assessment.

## **Proposed Action**

### Vegetation

Impacts to native vegetation are anticipated to be low to moderate. All of the habitat types along the proposed transmission line route, defined primarily by vegetation, are associations within the Sonoran desertscrub biome. Impacts to these habitats would include removal of existing vegetation during the clearing and grading of new access roads, tower sites, crane pads, wire splicing and pulling sites, and lay-down yards. Links 70, 90, 100, and 110 will require the

development of new access resulting in the potential removal of a greater amount of vegetation compared to Links 60 and 80. This would impact available forage, nesting sites, and protective cover provided by these plants. Other impacts could include increased human access to previously undisturbed areas, and an increase in areas susceptible to colonization by invasive plant species.

### Rangeland Health

Construction of the Proposed Action will have minimal effects on rangeland conditions in Maricopa County. Permanent loss of grazing land would occur at tower sites and associated spur roads. Temporary loss of grazing land would occur at temporary work areas and line tensioning/pulling sites.

### Wetlands and Other Water Sources

The crossing of the Hassayampa River floodplain by the proposed transmission line is of such width that it cannot be spanned and at least one structure will need to be placed in the river bottom. The footprint of a single pole structure in this area would have little impact on the Hassayampa River corridor.

### Invasive Plants (Noxious Weeds)

The potential for the introduction of invasive plant species during the construction of the transmission line will be minimized by implementing the standard construction and operating procedures and mitigation measures. These measures include thorough washing of construction equipment prior to arrival on the project, the re-seeding of disturbed areas with native seed and berming, plowing, and limiting access of unauthorized vehicles to access roads and the right-of-way.

### Wildlife

Overall impacts to wildlife are anticipated to be low. No impacts to amphibian or fish species are anticipated from the Proposed Action. There would be no impacts to sensitive species of reptiles with the exception of potential impacts to the desert tortoise and chuckwalla, which are discussed later in this section. Direct impacts to animals could include crushing of animals by construction equipment or vehicles traveling or operating within the project area. The proposed transmission line route will parallel the CAP Canal for a distance of approximately 25 miles and may have some effects to wildlife in the vicinity of the canal. The presence of a manmade permanent water

source in the harsh desert environment is highly attractive to many wildlife species but because it is fenced, a limited number of species can access this resource.

Specially designed bridges allow crossing of the CAP Canal in known wildlife corridors. A high perimeter fence was placed to keep out large animals, and the top five feet of the canal concrete embankment received a coarse-textured finish that allows small animals to pass through the perimeter fence, access the water, and leave successfully. Forty-five wildlife-watering structures were constructed in the vicinity to provide water for larger animals that would be attracted to the canal but could not access the water (CAP 1997).

Use of the CAP Canal by birds would not be adversely affected by the construction or operation of the transmission line. The presence of an occasional osprey in the vicinity of the canal is possible during the winter, but they would not be common. Ospreys could utilize transmission line structures for perches; however, due to the wide spacing of the conductors there would be no electrocution potential for any bird species. The potential does exist for collision of birds with transmission lines.

### Special Status Species

#### Federally Listed Species

##### *Cactus Ferruginous Pygmy-Owl*

There are historical records of the ferruginous pygmy-owl occurring in the vicinity of the study area, but no recent records in portions of the project study area where marginal habitat elements (primarily saguaros and large paloverde trees) are present. Pygmy-owl habitat elements in the study area are considered marginal due to their low density and lack of multi-tiered structure. Because of the absence of this species and the lack of suitable habitat within the project study area, no effects to the cactus ferruginous pygmy-owl is anticipated.

##### *Bald Eagle*

Bald eagles would not normally be present in the study area due to insufficient habitat elements, particularly large trees utilized for perches. Bald eagles in the western United states rarely use utility structures as perches (Wheeler 2003), and the presence of such structures in proximity to the CAP Canal would not likely be attractive to or utilized by bald eagles. Therefore, no effect to the bald eagle is anticipated.

## Other Species of Concern

### *Bats*

The presence of bats within the study area would be limited to nocturnal foraging activities, and no potential roosts for these species would be affected by the Proposed Action. Removal of vegetation could impact arthropod species on which bats feed. Alignment of new towers with existing towers would minimize vegetation loss due to the need for additional access routes. Additionally, reseeded areas with native plant seed would reduce encroachment of invasive plant species that could compete with native plants.

### Other Mammals

#### *Desert Bighorn Sheep*

Impacts to the bighorn sheep are anticipated to be low. Impacts to bighorn sheep that may be present in the area during construction would primarily be short term as a result of construction-related noise. Additionally, the presence of humans on foot in the area could keep bighorn sheep from utilizing water or forage that may be available seasonally at the green-up areas along the north side of the CAP Canal. Green-up areas along the CAP Canal are mostly within or close to the CAP Canal property, and should not be physically affected by construction or operation of the Proposed Action. If the proposed transmission line does approach a green-up area, the area could be spanned and no adverse effects to these habitats would be anticipated. The Proposed Action should not affect bighorn sheep that might utilize the Burnt Mountain area since the proposed transmission line route skirts Burnt Mountain on the flats where there is no protective cover for bighorn sheep. There would be no disturbance to bighorn sheep lambing activities since there are no suitable lambing areas near the proposed right-of-way. Standard construction and operating procedures and mitigation efforts would be limited to avoidance of impacts to the green-up areas during construction.

#### *Feral Burro*

Impacts to the feral burro are anticipated to be low. There is a moderate probability that feral burros would be present along the north side of the CAP Canal at some time during the construction phase of the project. Burros were observed by EPG field personnel in the study area in 2004. Impacts to the species would primarily occur from disturbance from construction activities, and increased access to the area from the construction of new access roads. The standard construction and operating procedures and mitigation measures can include the re-seeding of disturbed areas with native seed and berming, plowing, or activities otherwise limiting access of unauthorized vehicles to access roads and the right-of-way.

## Birds

Burrowing owls could be impacted by ground construction activities, but any owls present could be excluded from existing burrows and moved to other or newly created habitat. Other bird species could be impacted by collision with transmission wires or towers. Electrocutation of birds is not a potential for this project since tower design dimensions preclude even the largest bird species from spanning conductors or a conductor and a grounded structure.

## Reptiles

### *Desert Tortoise – Sonoran Population*

There is a potential for desert tortoise along sections of the Proposed Action, particularly in the Category 2 and 3 habitat areas identified along portions of Links 30, 60, 70, 80, 90, 100, and 110. After the final alignment of the transmission line is determined, pre-construction surveys would be performed to determine the presence and relative density of desert tortoises and quantify tortoise habitat impacts. Mitigation efforts would be applied to reach no net loss of quality or quantity of desert tortoise habitat in accordance with current BLM policy (*Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona*, October 1990).

Monitoring for desert tortoises may be required along certain areas of the proposed transmission line when construction activity occurs during tortoise season (March through October). With a tortoise monitor present during construction activity in tortoise season, impacts to desert tortoises could be minimized. Links 70, 90, 100, and 110 will require the development of new access resulting in the potential removal of a greater amount of vegetation associated with desert tortoise habitat compared to Links 60 and 80. Removal of vegetation, which may include plants utilized by desert tortoises for food or shade, during clearing of tower pads and access roads can in part be mitigated through post-construction re-seeding of disturbed areas with an appropriate native seed mix. To implement Mitigation Measure #22 (Appendix A) a mitigation plan for the Sonoran desert tortoise will be developed based on pre-construction survey data. This desert tortoise mitigation plan will be reviewed and approved by the BLM to ensure compliance with agency policy to achieve no net loss of quantity or quality of desert tortoise habitat prior to start of construction activities.

### *Arizona Chuckwalla*

Any areas where the proposed transmission line passes through rocky terrain consisting of boulders or bedrock where crevices are present could support chuckwallas. The primary areas where the chuckwallas may occur on the proposed right-of-way are portions of the foothills of the Belmont Mountains (Links 90 and 100), and in small areas on the southwest side of the Palo Verde Hills (Link 30).

Impacts to the chuckwalla could include loss of habitat by removal of boulders or bedrock for tower placement, crushing by construction equipment, and loss of vegetation that supports this herbivorous species. Selection of tower placement away from rocky habitat can eliminate take of chuckwallas and loss of habitat for the species. Areas of disturbed ground near chuckwalla habitat could be reseeded with native plant seed to minimize encroachment of invasive plant species. Provided tower selection avoids rocky habitat, minimal impacts to the Arizona chuckwalla are anticipated.

### **Switchyards and Substation**

Impacts to vegetation at the proposed Arlington Switchyard site are anticipated to be low. The proposed site for the Arlington Switchyard is located within the Arlington Power Plant property. Construction of the switchyard would be contiguous with the existing facility. Impacts to wildlife at this site are anticipated to be low. Prior to construction the site should be checked for the presence of burrowing owls and moved (if present).

Impacts to vegetation at the proposed HJS site are anticipated to be low. The existing vegetation is sparse creosote bush/bursage habitat, consisting primarily of creosote bush. Vegetation in this area, particularly foothill paloverde trees, tends to have a somewhat stunted appearance due to the lack of rainfall and poor local soil conditions. Impacts to wildlife at this site are anticipated to be low. Prior to construction the site should be checked for the presence of burrowing owls and moved (if present). No other special status animal species would be impacted or present at the site. Similar to conditions along the proposed transmission line, there could be some impacts to reptile species and burrowing animals during the clearing of the site, including crushing of animals in their burrows.

Impacts to vegetation present at the TS-5 Substation site are anticipated to be low. The TS-5 Substation site is situated in creosote bush/bursage habitat. The clearing of vegetation on site could remove some bird nesting and cover habitat; however, an existing dirt road located within this area could be utilized for construction access, thereby minimizing the loss of habitat. Impacts to wildlife could include crushing of reptile species in vegetation or burrows during clearing of the site. There is some potential for the presence of burrowing owls on the site. Prior to construction the site should be checked for the presence of burrowing owls, and moved (if present). Wild burros could occasionally use this area, but there is substantial suitable habitat for this species in the surrounding area. No other special status animal species are anticipated to be present on the TS-5 Substation site. Similar to conditions along the proposed transmission line, there could be some impacts to reptile species and burrowing animals during the clearing of the site, including crushing of animals in their burrows.

## No-Action Alternative

Under the No-Action alternative the project would not be constructed, no biological resources would be affected, and no environmental consequences would occur; however, the purpose and need for the project would not be met.

### 3.6 SOCIOECONOMICS

This section of the EA addresses socioeconomic conditions within the study area including population, principal economic activities, income and employment, and a discussion of environmental justice related to the construction, operation, and maintenance of the proposed transmission line and switchyard/substation facilities. Section 3.6.1 provides a description of the potential socioeconomic conditions within the study area of the proposed project. Section 3.6.2 provides a description of the potential socioeconomic impacts of the proposed project.

#### 3.6.1 Affected Environment

The Proposed Action would be located in a largely rural, undeveloped area of western Maricopa County, Arizona. Maricopa County is located in central Arizona and encompasses 9,203 square miles with a population density of about 333.8 persons per square mile (Census 2000). The major industries in the county are services, retail trade, and manufacturing. The nearly 3.1 million residents of Maricopa County comprise a majority (60 percent) of the state's population. The county's population is expected to reach 3,709,506 by 2010 (Department of Economic Security 1997); however, if the current rate of growth is maintained (Table 3-2) the population would be nearly 4.5 million.

<b>Location</b>	<b>1990</b>	<b>2000</b>	<b>Percent Increase</b>
Arizona	3,665,228	5,130,632	40.0
Maricopa County	2,122,101	3,072,149	44.8
Buckeye	4,436	6,537	47.3

The nearest communities to the proposed route are the Town of Buckeye, roughly 16 miles east of the PV Hub and the unincorporated community of Tonopah, located about 9 miles north of the PV Hub. The Town of Buckeye Municipal Planning Area (MPA) contains over 500 square miles, of which approximately 160 square miles are currently annexed into the Town. Population projections for the Buckeye MPA indicate a population of 28,144 by the year 2010 (Department of Economic Security 1997). The 2000 population for the Town of Buckeye was 8,497 (corrected count, Department of Economic Security 2001), and 11,955 in 2002 (Arizona Department of Commerce 2004). The Tonopah community has a population of approximately 1,200 and shares similar employment opportunities with the Town of Buckeye, with agriculture

being the predominant employer (Arizona Department of Commerce 2004). Both communities are within commuting distance to the Phoenix metropolitan area, which offers a greater diversity of employment opportunities.

Residential development in the study area is primarily located along Wintersburg and Elliot roads in the southern portion of the study area, near the Salome and Tonopah-Salome highways in the central portion of the study area, and south of the CAP Canal (west of Wickenburg Road), in the northern portion of the study area.

### **Principal Economic Activities**

Tonopah and Buckeye historically have been agricultural communities; however, the Town of Buckeye has numerous residential communities planned for development. Agriculture is the predominant employer in Buckeye; however, local power plants and a Department of Corrections prison also are major employers (Arizona Department of Commerce 2004). The PVNGS also plays a major role in the local economy and work force of this area. The facility has an estimated 2,800 permanent on-site employees. Other key developments within the study area include the power plant facilities at Redhawk, Arlington, and Mesquite in the PV Hub. Supporting generation also is a key development component of this area with the location of the Hassayampa Switchyard south of the PVNGS and numerous transmission lines including the Palo Verde-Devers No. 1 and Harquahala-Hassayampa 500kV transmission lines in the southern portion of the study area. Other high-voltage transmission lines are located in the northern portion of the study area near the Hassayampa River. The CAP Canal is a key economic and water resource for the central and southern portions of the state, transporting approximately 1.5 million acre-feet of water from the Colorado River annually (CAWCD 2004).

In addition to electrical generation and transmission facilities, the Town of Buckeye and the surrounding area is a leading producer of Pima cotton. Other area employment includes Wal-Mart (bulk storage and packaging) and Schult Homes (manufactured housing) (Arizona Department of Commerce 2004).

The central portion of the study area is bisected by I-10, the major highway linking Phoenix with Los Angeles, California. Other major roads described in Section 3.2.1 have some importance to the regional economy as transportation routes.

### **Income and Employment**

Data collected from the Town of Buckeye indicate an unemployment rate for the area of 11.3 percent in 2003. The unemployment rate for Maricopa County was 4.9 percent for the same period. The median household income for the Town of Buckeye was \$35,383 in 2002 compared to \$45,776 for Maricopa County during the same time period.

## **Environmental Justice**

Presidential Executive Order 12898 (EO 12898), regarding “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations.

According to figures from the 2000 Census, the demographics for the Town of Buckeye were 70.9 percent White, 24.3 percent Hispanic, 2.9 percent black or African-American, 1.4 percent American Indian, 0.5 percent Asian/Pacific Islander, and 0.1 percent other races. Maricopa County recorded 66.2 percent White, 24.8 percent Hispanic, 3.5 percent black or African American, 2.1 percent Asian, 1.5 percent American Indian, and 1.6 percent two or more races.

### **3.6.2 Environmental Consequences**

#### **Proposed Action, Switchyards, and Substation**

The primary effects to socioeconomics associated with the Proposed Action include the construction period and fiscal impacts to local jurisdictions. In general, surrounding communities would likely experience an increase in employment and income from the project construction. Any local hiring would primarily be laborers and depend on the skills of individuals. Other social impacts would include potential short-term impacts from the influx of construction workers such as short-term housing or motel use. Long-term impacts could include economic effects of operation and maintenance activities and tax revenue from easements through federal, State Trust, and private lands in Maricopa County.

Public contact activities that occurred to ensure that appropriate notification of the proposed project was provided are described in Chapter 5.

#### **Impacts on Minority and Low Income Communities**

No disproportionately high or adverse environmental impacts on Native Americans or minority or low-income communities in surrounding areas are anticipated to occur from the Proposed Action. The proposed project would potentially provide jobs to minority and low-income communities and positive economic effects associated with tax revenues.

## **No-Action Alternative**

Under the No-Action alternative, the project would not be constructed; however, the purpose and need for the project would not be met and ability to meet the demand for electrical transmission in developing areas in the western Phoenix metropolitan area would be comprised. Additionally, the lack of an additional transmission source to the valley (TS-5 Substation) would not strengthen the Phoenix metropolitan area transmission system and could have potentially negative socioeconomic impacts on the region. Selection of the No-Action alternative would result in a loss of economic and employment benefits and tax revenues associated with the proposed facilities and future electrical generation.

### **3.7 EARTH AND WATER RESOURCES**

This section of the EA addresses earth and water resources including geology, soils, and surface and ground water resources related to the construction, operation, and maintenance of the proposed transmission line and switchyard/substation facilities. Section 3.7.1 provides a description of the affected earth and water resources environment for the proposed project. Section 3.7.2 provides a description of the potential impacts to earth and water resources.

#### **3.7.1 Affected Environment**

##### **Geology**

The study area is located near the northwestern boundary of the Lower Hassayampa Basin, which is a structural depression of the Basin and Range Physiographic province (CAWCD 2004a). The area is characterized by broad, gently sloping, alluvial plains separated by predominantly north to northwest trending mountains (Arizona Department of Water Resources [ADWR] 1999).

The majority of the study corridor includes older surficial deposits characterized as containing alluvium. The sequence of basin-fill sediments in the lower Hassayampa Subbasin consists of three hydrogeologic units designated as upper, middle, and lower alluvium (CAWCD 2004a). The upper unit is 30 to 60 feet thick and consists of sand and gravel. The middle unit, 230 to 300 feet thick, consists of clay and silt. The lower unit, from 100 to more than 1,000 feet thick, consists of unconsolidated sand and moderately to well consolidated alluvial fan deposits (ADWR 1999).

The mountains that comprise the margins of the Harquahala Plain result from uplifted fault blocks, which are composed of crystalline (igneous and metamorphic) bedrock, minor sedimentary rock (such as sandstone and limestone), and volcanic tuff and lava flows (BLM 2000). The Belmont Mountains generally consist of Pre-Cambrian granite with outcrops of

Quaternary basalt and tertiary volcanic and metamorphic rock. The dark hills in the Tonopah and Saddle Mountain area consist of tertiary volcanic rocks and a few Quaternary lava flows (Chronic 1983).

## **Soils**

The soils crossed by the proposed project in the study area are nearly level to moderately steep gravelly loams and loams on old alluvial fans associated with the valley plains both north and south of I-10 (U.S. Department of Agriculture [USDA] 1977, 1986). Soils in these areas are deep, well drained, and derived from acid and basic igneous rock (USDA 1977, 1986). In areas associated with the Winters Wash in the southern portion of the study area, the typical soil type consists of nearly level loams and clay loams formed from recent alluvium. The Hassayampa River and adjacent floodplain are comprised of nearly level and gently sloping, occasionally flooded, very gravelly, sandy soils formed in alluvium and derived from acid and basic igneous rock (USDA 1977, 1986).

Although vegetative cover in the study area is sparse, the quantities of runoff generated are low because of the small amounts of rainfall received in the area. The low slope gradients of soils in the majority of the study area keep the erosion potential down. In this study corridor, wind erosion is not believed to be a significant force on undisturbed soil surfaces (USDI 1980).

## **Water Resources**

The study area is primarily located within the Hassayampa Subbasin of the Phoenix Active Management Area (AMA) as defined by the ADWR (1999). The study area is primarily composed of the Hassayampa and Centennial Wash watersheds, with a very small portion of the Lower Gila-Painted Rock Reservoir watershed located in both the northern and southern portion of the study area (Environmental Protection Agency 2004). The CAP Canal, managed in cooperation by the CAWCD and BOR, flows from west to east across the northern portion of the study area. The Hassayampa River is located in the northeastern portion of the study area along Link 120 and is considered an intermittent to ephemeral tributary within the Phoenix AMA (ADWR 1999). The proposed transmission line route also crosses a series of north-south trending washes including the Winters Wash in the southern portion of the study area (Link 30); the Old Camp and Winters washes (Links 60 and 70); and the Jackrabbit, Coyote, Star, and Daggs washes (Link 120) in the northern portion of the study area.

The Federal Emergency Management Agency has delineated the 100-year floodplain within the study area. Areas within the 100-year floodplain include a corridor on the northern side of the CAP Canal associated with a linear earthen berm built along the northern side of the facility in the study area to prevent damage to the canal from stormwater and flood events. Additionally, areas associated with the Coyote and Star washes in the western portion of the study area and the

Hassayampa River also are designated within the 100-year floodplain. Designs for structures to be built within the floodplain of the Hassayampa River would be reviewed by the Maricopa County Flood Control District and Army Corps of Engineers.

Drilling conducted by the CAWCD indicates that the depth to groundwater along the northern portion of the study area is approximately 490 feet below the surface (CAWCD 2004a). Groundwater generally flows from northwest to southeast within the northern portion of the study area west of the Hassayampa River. As noted in Section 3.2.1, the CAWCD is currently involved in the implementation of the TDRP, a direct water recharge project located approximately 7 miles northwest of Tonopah and immediately south of Links 60 and 70.

### **3.7.2 Environmental Consequences**

#### **Proposed Action, Switchyards, and Substation**

Impacts on soil and water resources are anticipated to be minimal. Standard construction and operating procedures and mitigation measures include spanning washes where possible, using existing access roads, limiting surface disturbance, and restoring vegetation to the extent practicable. Increases in erosion potential are therefore expected to be minimal and short term in duration. In those areas with desert pavement, minimizing surface disturbance would reduce the potential for increased surface erosion.

#### **Hazardous and Solid Wastes**

Construction of the line would create small quantities of construction wastes, which would be disposed of in accordance with the project Plan of Development. Surface contamination could occur, resulting from accidental spills of petroleum and other potentially hazardous materials used in construction activities. The potential for soil contamination is reduced by requiring prompt removal of petroleum and other hazardous materials.

#### **No-Action Alternative**

Under the No-Action alternative, the project would not be constructed, no earth and water resources would be affected, and no environmental consequences would occur; however, the purpose and need for the project would not be met.

## 3.8 HEALTH AND SAFETY

This section of the EA addresses health and safety issues including air quality and noise resources related to the construction, operation, and maintenance of the proposed transmission line and switchyard/substation facilities. Section 3.8.1 provides a description of the affected air and noise resources for the proposed project. Section 3.8.2 provides a description of the potential impacts to air and noise resources. No other health and safety impacts are anticipated to the human environment as a result of the implementation of the Proposed Action.

### 3.8.1 Affected Environment

#### **Air Quality**

The project study area is designated "attainment" for all criteria pollutants (Environmental Protection Agency 2004a). Additionally, the Proposed Action is located a distance of more than 50 miles from the nearest designated Class I Wilderness Area, such as the Superstition or Mazatzal wilderness areas and approximately 2 miles from the nearest Class II Wilderness Area, the Big Horn Mountains Wilderness Area. The project study area is approximately 40 miles west of the Phoenix metropolitan non-attainment area (for carbon monoxide, ozone, and particulate matter nominally 10 meters or less).

The project is not expected to have any adverse impact on Class I or II air quality related values such as visibility, wildlife, or vegetation. The existing air quality along the proposed corridor is generally good. Any pollution is from naturally occurring blowing dust or long-range pollutants from distant areas such as the Phoenix metropolitan area.

#### **Noise**

Ambient noise in the study area is minimal with intermittent noise from passing vehicles primarily on I-10, Wintersburg Road, Elliott Road, Tonopah-Salome Highway, and Wickenburg Road.

Corona represents power loss on the transmission line and creates transmission line noise. Audible noise created by corona discharge along the transmission line is directly related to the amount of corona, which is in turn affected by meteorological conditions (most notably rain).

The audible noise from a switchyard or substation is generally intermittent and is the result of operation of equipment in the facility such as circuit breakers and disconnect switches. The transformers in the substation may emit a sound that can be characterized as a hum within the frequency range of the human ear.

### **3.8.2 Environmental Consequences**

#### **Proposed Action, Switchyards, and Substation**

Construction activities would result in fugitive dust emissions due to earth-moving activities at the transmission structure, switchyard, and substation sites. In addition, vehicular travel and operation of construction equipment would generate engine exhaust emissions. Emissions would be managed to comply with applicable federal, state, and local requirements. Fugitive emissions would be reduced through the use of watering and/or surface stabilization measures as required to comply with Maricopa County regulations. There would be no measurable air emissions associated with operation of the line.

Historical noise measurements along transmission corridors in similar settings (open desert) have shown normal ambient audible noise levels in the range of 43 to 52 decibels, A-weighted with an average value of 50 decibels, A-weighted (USDI 1980). The line noise would normally be inaudible at the edge of the right-of-way during fair weather. Considering the relatively few hours of audible noise producing weather, the location of the line with respect to neighboring land uses, and the calculated audible noise levels during foul weather, minimal audible noise impacts are expected.

Sound levels are specified at the time of purchase of the switchyard and substation equipment. The design of the substation will be such that the hum generated by the transformers will be in compliance with the sound level required by industry standards, governing regulations, and local ordinances.

#### **No-Action Alternative**

Under the No-Action alternative, the project would not be constructed, no air and noise resources would be affected, and no environmental consequences would occur; however, the purpose and need for the project would not be met.

# CHAPTER 4

## CHAPTER 4 CUMULATIVE IMPACTS

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### 4.1 INTRODUCTION

Cumulative impact, as defined by the Council on Environmental Quality (40 CFR 1508.7), is the impact on the environment that results from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts are interdisciplinary, multi-jurisdictional, and usually do not conform to political boundaries.

To determine the cumulative effects in the analysis area, past, present, and future actions were evaluated. In addition, the analysis focused on meaningful effects related to long-term productivity of the resources analyzed. Impacts to vegetation, soils, wildlife habitat, cultural resources, grazing, and dispersed recreation are accounted for by activities that take place within the analysis boundary. The cumulative impact analysis area for this project is defined for the resource being analyzed. Table 4-1 (at the end of Chapter 4) describes the activities (existing and proposed) that may cumulatively affect resources of concern for the PV Hub to TS-5 500kV Transmission Project.

### 4.2 FINDINGS

The Proposed Action involves one single-circuit 500kV transmission line, which would originate from the PV Hub at either the PVNGS Switchyard or the Arlington Power Plant and would connect into the TS-5 Substation site generally located south of the Hassayampa Pumping Plant along the CAP Canal, west of 291<sup>st</sup> Avenue and north of the Beardsley Road alignment. The right-of-way would be approximately 200 feet in width and approximately 42 to 44 miles in length. The proposed 500kV transmission line would cross BLM, BOR, ASLD, and/or private lands. The proposed project would be located within a 1-mile-wide BLM-designated utility corridors on BLM lands.

#### 4.2.1 Past, Present, and Future Development

To determine the cumulative effects in the analysis area, past, present, and future actions within the same geographic region were evaluated. These actions predominantly include transmission lines, other utilities, and future development projects.

Numerous existing linear features including transmission lines, power distribution lines, the CAP Canal, and other such facilities are located throughout the project area. The existing linear facilities of most significance that would be paralleled by the proposed route are listed below:

- Palo Verde–Devers No. 1 500kV transmission line (located in Palo Verde–Devers Utility Corridor)

- Harquahala–Hassayampa 500kV transmission line (located in Palo Verde–Devers Utility Corridor)
- Central Arizona Project Canal (located in the CAP utility corridor)
- WAPA Hassayampa Pumping Plant 230kV transmission line

For the purpose of addressing cumulative impacts, it is assumed that there could be a total of four 500kV lines for the first 12 to 13 miles of the proposed project within the Palo Verde–Devers Utility Corridor south of I-10. The four 500kV transmission lines include the existing Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV lines, the proposed Palo Verde–Devers No. 2 transmission line, which has been authorized by the BLM, and the proposed line for the planned PV Hub to TS-5 500kV Transmission Project. Within the BLM-designated utility corridor for the CAP Canal, the Proposed Action is the only transmission line or utility currently planned for the corridor.

#### **4.2.2 Summary of Cumulative Impacts**

The discussion of potential cumulative impacts of the project by resource is provided below. The incremental impact of the Proposed Action will be minimal when added to other past, present, and reasonably foreseeable future actions. The proposed project will not contribute substantially to cumulative impacts on the environment. In addition, Table 4-1 contains a list of past, present, and future activities that may cumulatively affect resources of concern for the Proposed Action.

#### **Land Use**

Cumulative impacts to land uses are anticipated to be minimal with the addition of the Proposed Action. The project will be developed primarily on vacant/undeveloped land within the study area. Small areas of rangeland used for grazing and forage, agricultural lands, and mining could be permanently removed from production by tower foundations and spur roads, where necessary. These impacts would accumulate with the existing Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV lines and the CAP Canal, although the total area lost from production would be small in the context of the region. The proposed transmission line will be installed within the BLM-designated utility corridors (1 mile wide) on lands administrated by BLM, thus consolidating transmission lines in a planned location, which is consistent with the RMP and MFP.

#### **Visual**

Cumulative visual impacts will increase with effects on views from highways, residences, and recreational areas, as well as on natural scenic quality. The first transmission line or industrial linear feature (i.e., the CAP Canal) built in a natural setting usually will cause the most noticeable incremental change because of the contrast of form, line, color, and texture to the

surroundings. Each successive change, such as the Proposed Action, becomes less noticeable than the first; however, the new combination of all the changes (e.g., form, line, color, and texture) is more evident. Existing access will be utilized for the proposed project in the existing Palo Verde-Devers Utility Corridor, which will reduce exposing lighter colored surface and vegetative removal associated with the development of new access. In areas where future transmission lines are anticipated, new access and vegetative removal may be required. Applied mitigation that would be effective in reducing visual impacts would include the reclamation of areas disturbed by construction-related activities.

A segment of the future MCRT alignment parallels the CAP Canal. The MCRT may be placed either north or south of the CAP Canal based on the final alignment. The MCRT alignment south of the CAP Canal could have low to minimal visual impacts. The alignment north of the CAP Canal could have low to moderate visual impacts.

### **Cultural Resources**

Construction of the Proposed Action will not directly affect archaeological sites within the corridor if ground disturbance activities occur outside of the archaeological site boundaries. The potential to effectively mitigate impacts to archaeological and historical sites is high. Careful placement of new transmission line towers, work areas, and access roads beyond site boundaries will reduce incremental impacts to cultural resources with the survey corridor. Cumulative damage to cultural resources could result over time from repeated incremental damage caused by motorized vehicles, such as off-highway vehicles. Indirect impacts on cultural resources can result from degrading the setting of a significant cultural feature, and incidental destruction of cultural sites or traditional cultural areas by off-highway vehicle recreationists, due to new access roads. However, the Proposed Action may only potentially require new access roads in selective areas north of the CAP Canal, therefore minimizing cumulative impacts to cultural resources. The presence of multiple transmission lines likely will not contribute measurably to this type of a cumulative effect more so than a new single transmission line.

### **Biology**

Cumulative biological impacts generally will be additive, and usually directly proportional to the amount of ground disturbed. Cumulative effects also depend, to some extent, on whether or not construction activities for the Proposed Action are concurrent or overlapping in a given area with other future projects (see Table 4-1). If construction is occurring concurrently, a higher volume of traffic may result and possibly greater amounts of ground disturbance (erosion, etc.) would occur. Overlapping activity, conversely, may create disturbance to wildlife for a longer period of time, resulting in prolonged or permanent displacement of wildlife from crucial habitats.

Within BLM-designated utility corridors, access roads may serve more than one line and would therefore minimize ground disturbance and the amount of increased access in some areas.

Cumulative impacts associated with the Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV lines and/or the CAP, and the Proposed Action in one corridor would likely produce impacts that are of a slightly higher degree and possibly longer duration.

### **Socioeconomics**

If the Proposed Action were built, a cumulative beneficial impact to the northwest Phoenix metropolitan area, including increased availability of electricity and revenues realized due to construction activities and property tax revenues, would result. Cumulative impacts to socioeconomics generally are only a concern if they would over-extend public services and accommodations in the project area.

### **Earth and Water Resources**

It is anticipated that the cumulative effects on earth and water resources will not be measurably different than the additive effects of the Proposed Action. The potential for wind and water soil erosion, stream bank degradation, and sedimentation in water bodies, dependent on the mitigation implemented, could be increased with the proposed project. Ground disturbance would be, in general, incrementally less when paralleling existing transmission lines and/or the CAP Canal. Ground disturbance generally is minimized for the Proposed Action, since the majority of the proposed transmission line parallels existing access roads and landscape reclamation will be implemented for areas disturbed during construction.

### **Health and Safety**

It is anticipated that the power transmitted over the Proposed Action will come from existing capacity generated in the PVNGS region. A potential indirect cumulative impact associated with the transmission line is increasing emissions from existing federally and state permitted natural gas fueled power plants, such as those listed in Table 4-1.

With the addition of the Proposed Action, cumulative impacts associated with corona-generated audible noise would be additive, but not double the level of the existing Palo Verde–Devers No. 1 and Harquahala–Hassayampa 500kV lines. The increased noise levels from the Proposed Action may be discernible. Although noise may be audible during wet-weather conditions, line noise would most often be masked by naturally occurring sounds at locations beyond the right-of-way.

**TABLE 4-1  
PROJECTS LIST - CUMULATIVE EFFECTS**

Activities	Location/Description	Status
<b>Proposed Action – PV Hub to TS-5 500kV Transmission Line</b>		
PV Hub to TS-5 500kV Transmission Line	Proposed 500kV transmission line from the PV Hub to the planned TS-5 Substation along the CAP Canal west of 291 <sup>st</sup> Avenue and north of the Beardsley Road Alignment, with an optional interconnection at either the proposed Harquahala Junction Switchyard.	Future
<b>Future Utilities/Public Services</b>		
Proposed Palo Verde–Devers No. 2 500kV Transmission Project	The 500kV transmission line would connect at either the HGP Switchyard or the PVNGS Switchyard and terminates at the Devers Substation immediately north of Palm Springs, California.	Future
Proposed TS-5 to Raceway 500kV Transmission Line	The 500kV transmission line would start at the TS-5 Substation and terminate at the Raceway Substation located approximately 3 miles south of Lake Pleasant.	Future
Proposed West Valley North 230kV Transmission Line Project	The 230kV transmission line and substation would be located on the east and north side of the White Tank Mountains and terminate at the TS-5 Substation.	Future
Proposed Hassayampa–Pinal West 500kV Transmission Line	The Hassayampa–Pinal West 500kV transmission line is proposed to connect at the Hassayampa Switchyard south of PVNGS and terminate at a proposed substation near Mobile, Arizona.	Future
Proposed PVNGS–Saguaro 500kV Transmission Line	The 500kV transmission line would start at PVNGS and terminate at the Saguaro Power Plant, paralleling the existing PVNGS–Kyrene 500kV line.	Future
Proposed Sonora-Arizona Interconnection 345kV (two) transmission lines	The two 345kV transmission lines would start at either PVNGS or Hassayampa Switchyard and terminate in Sonora, Mexico.	Future
Planned Northwest Buckeye Electrical Infrastructure	Additional 500kV, 230kV, and 69kV transmission lines not identified in the APS 10-year plan. Lines would originate at the TS-5 Substation and provide electrical service to future development as needed in northwest Buckeye, Arizona.	Future
Planned Hassayampa–Jojoba 500kV Transmission Line	The 500kV transmission line would connect the Hassayampa Switchyard near PVNGS to the Jojoba Switchyard south of Buckeye, Arizona.	Future
Planned CANAMEX Commercial Transportation Corridor	Inter-continental commercial transportation corridor between Canada and Mexico. Located adjacent to Wickenburg Road in the project area.	Future
<b>Existing Utilities/Public Services</b>		
PVNGS	Located in unincorporated Arlington Valley, Arizona. Numerous 500kV lines interconnect at the PVNGS Switchyard.	Past, Present
PVNGS Switchyard	Located near PVNGS with numerous 500kV lines interconnecting at this switchyard.	Past, Present, Future
Hassayampa 500kV Switchyard	Located south of the PVNGS. Numerous 500kV lines interconnect at this switchyard.	Past, Present
Palo Verde–Devers No. 1 Transmission Line	A 500kV line that connects at the PVNGS Switchyard and terminates at the Devers Substation north of Palm Springs, California.	Past, Present

<b>TABLE 4-1 PROJECTS LIST - CUMULATIVE EFFECTS</b>		
<b>Activities</b>	<b>Location/Description</b>	<b>Status</b>
Palo Verde–Rudd Transmission Line	A 500kV transmission line that originates at the PVNGS Switchyard and terminates at the Rudd Substation in Avondale, Arizona.	Past, Present
PVNGS–Westwing Transmission Line	Two 500kV transmission lines from PVNGS to the Westwing Substation.	Past, Present
Southwest Powerlink Transmission Line	A 500kV line that begins at the Hassayampa Switchyard, connects to the North Gila Substation in Yuma, Arizona and Imperial Valley Substation near El Centro, California and terminates at the Miguel Substation in San Diego, California.	Past, Present
PVNGS–Kyrene 500kV Transmission Line	PVNGS–Kyrene 500kV transmission line originates at the PVNGS Switchyard, ending at the Kyrene Substation in Tempe, Arizona.	Past, Present
HGP and Harquahala–Hassayampa 500kV Transmission Line	The HGP is located approximately 17 miles northwest of the PVNGS. A 500kV transmission line connects the HGP and the Hassayampa Switchyard.	Past, Present, Future
Arlington Valley Energy Facility	The Arlington facility is located south of PVNGS and west of the Mesquite Power Plant. A 500kV transmission line connects the Arlington Power Plant and the Hassayampa Switchyard.	Past, Present, Future
Mesquite Power Generating Station and 500kV Transmission Line	The Mesquite facility is located south of PVNGS and west of the Hassayampa Switchyard. A 500kV transmission line connects the Mesquite Plant and the Hassayampa Switchyard.	Past, Present
Redhawk and 500kV Transmission Line	The Redhawk facility is located south of PVNGS and southeast of the Hassayampa Switchyard. A 500kV transmission line connects the plant and the Hassayampa Switchyard.	Past, Present
Pipelines	El Paso Natural Gas pipelines connect to the various gas-fired generation facilities in the region around PVNGS as well as HGP.	Past, Present
Canals	The CAP Canal is parallel to the proposed project for over half of the alignment. The CAP Canal spans west-east within the project study area north of I-10. Other secondary canals are located in the study area.	Past, Present
Tonopah Recharge Project	Series of ground water recharge ponds located south of the CAP Canal approximately 7 miles northwest of Tonopah.	Present, Future
I-10	This major interstate highway spans an east-west direction in the project study area.	Past, Present
<b>Residential</b>		
Rural residential	Throughout project area.	Past, Present, Future
Master Planned Residential Development	Located primarily in the northeast portion of the project area.	Present, Future
<b>Agriculture, Grazing, and Mining</b>		
Farming	Cultivated private land throughout the project area.	Past, Present, Future
Grazing	Throughout project area.	Past, Present, Future
Mining	Throughout project area.	Past, Present, Future

# CHAPTER 5

## **CHAPTER 5 – CONSULTATION AND COORDINATION**

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### **5.1 PUBLIC CONTACT INFORMATION**

A public information program for the PV Hub to TS-5 500kV Transmission Project was conducted during the preparation of this EA to establish and maintain open communication with the public. The public involvement program included public meetings, informational mailings, and the provision of other resources of information such as a project website and phone line. By providing the public with multiple opportunities to access project information and relay comments, the project team was able to educate the public about the proposed project, as well as gather public input, identify issues, and respond to those issues through the planning process.

### **5.2 AGENCIES, TRIBES, AND ORGANIZATIONS CONSULTED**

#### **5.2.1 Federal**

U.S. Department of Interior  
Bureau of Land Management - Phoenix Field Office  
Fish and Wildlife Service  
Bureau of Reclamation  
U.S. Department of Defense - Luke Air Force Base  
Western Area Power Administration

#### **5.2.2 Native American**

Ak-Chin Indian Community  
Fort McDowell Yavapai Nation  
Fort Mojave Tribe  
Gila River Indian Community  
Hopi Tribe  
Salt-River Pima – Maricopa Community  
Yavapai-Apache Nation  
Yavapai–Prescott Indian Tribe

#### **5.2.3 State**

Arizona Department of Environmental Quality  
Arizona Department of Transportation  
Arizona Game and Fish Department  
Arizona State Historic Preservation Office  
Arizona State Land Department

Arizona State Museum  
Central Arizona Water Conservation District

#### **5.2.4 County and City**

Maricopa County Association of Governments  
Maricopa County Board of Supervisors  
    Andrew Kunasek  
    Max Wilson  
    Mary Rose Wilcox  
Maricopa County Department of Transportation  
Maricopa County Flood Control District  
Maricopa County Parks and Recreation Department  
Maricopa County Planning Department  
Maricopa County Trails Development Committee  
Tonopah Community Council  
Tonopah Valley Association  
Town of Buckeye

#### **5.2.5 Public Meetings**

##### **Jurisdictional Meeting**

In mid-March 2004, APS invited members of potentially impacted agencies or jurisdictions to a meeting at which they could review project information and discuss potential concerns in a small, informal setting. The meeting was scheduled to closely coincide with the mailing of the first project newsletter, which announced the project to the general public. Ten representatives of nine separate jurisdictions or agencies were invited to the meeting. Seven people representing the BOR, Luke Air Force Base, CAP Canal, Maricopa County, and Town of Buckeye attended the meeting.

During the meeting the project team presented a project overview, including a description of other APS projects in the West Valley, and a summary of past efforts with the BLM to identify utility corridors in the BLM RMP revision. The presentation also included information on the project description and planning process, including state and federal permitting requirements.

##### **Public Open Houses**

One public open house was conducted on March 30, 2004 to introduce the project and obtain public feedback. The meeting was held in Tonopah, Arizona and was attended by 37 people. The open house was organized in an informal format, allowing community members to attend at their convenience, review displays, and speak with project team members. General information was presented on project need, description, environmental resources, alternatives evaluated, and the

planning process. Comment forms were provided to solicit public comment on the proposed and alternative routes and information that had been presented. A total of 16 comment forms were received either during the open house or by mail following the meeting.

### **5.2.6 Informational Mailings**

#### **BLM Informational Letters**

An informational letter describing the Proposed Action and the project study area was distributed by the BLM in March 2004 to over 300 individuals on their mailing list who live within the study area. The letter invited recipients to provide any comments to the BLM within a 30-day period.

A second BLM informational letter was developed and distributed in September 2004 to inform the public regarding a modification to the project description to include the Harquahala 500kV Interconnection Area as a potential system option for the development of the Proposed Action. The informational letter was distributed to the same individuals who received the initial BLM letter in March 2004.

Both BLM informational letters are included in Appendix D.

#### **Newsletter and Mailing List**

One newsletter was prepared and distributed to approximately 7,600 people. The mailing list included all APS customers and private landowners within the study area, as well as jurisdictional and local government leaders and the BLM Phoenix Field Office mailing list. Those who attended the public open house or submitted comments were added to the project mailing list to receive any future newsletter(s). The newsletter provided team contact information, including the phone line number and website address, as well as a project update.

The newsletter introduced the project to the public and included a description of the proposed facilities, need for the project, environmental planning process, public information opportunities, proposed route, state and federal permitting requirements, and announced the first public open house for March 2004.

A copy of the newsletter is included in Appendix D.

### **5.2.7 Other Sources of Project Information**

#### **Website**

A website, <http://siting.apsc.com/current/paloverdets5/default.htm>, was established and maintained to provide access to project information and electronic versions of distributed

materials. Through the website, viewers could obtain meeting dates; view current and past newsletters and routing maps; submit written comments or requests; and be added to the mailing list. The website address was advertised in newsletters, on the telephone information line, and in paid advertisements. To date, 16 comments have been received through the website.

### **Phone Line**

A phone information line, (602) 794-9000, was established early in the project to provide the public with easy access to project information and team members. The phone line relayed project updates and public meeting dates, and allowed callers to leave a comment regarding the project or a message requesting they be added to the project mailing list or contacted by a team member. This phone line was advertised in newsletters, on the project website, and in paid advertisements. To date, 23 comments or messages have been received on this phone line.

### **Media Coverage**

APS briefed local news sources and placed paid advertisements for the March open house meeting. In particular, APS briefed the *West Valley View Newspaper* and *Arizona Republic*. The *West Valley View Newspaper* ran a story on the project describing the purpose and need for the project and the upcoming federal and state planning processes.

## **5.3 ISSUE IDENTIFICATION**

The project team received 66 comments on the project through the open house comment forms, website, phone line, or directly through letter, phone calls, and emails. An additional 10 comments were received by the BLM during the first scoping comment period that concluded on April 30, 2004. The BLM received seven comments during the second comment period that concluded on October 20, 2004. Review of these comments helped the project team to identify public issues, which were considered during studies conducted in completion of the EA. The majority of comments focused on the location of facilities, potential impact to private landowners, biological and recreational resources north of the CAP Canal, and visual and aesthetic concerns near the Belmont Mountains. A summary of the comments received is provided in Appendix E.

## 5.4 KEY PREPARERS

### 5.4.1 Bureau of Land Management

Teresa Raml	Field Manager/Authorized Officer
Camille Champion	Project Manager
Jim Andersen	Realty Specialist
Cheryl Blanchard	Archaeologist
Tim Hughes	Wildlife Biologist
Rich Hanson	Recreation Planner / Visual Resource Specialist
Jack Ragsdale	Recreation Planner / Visual Resource Specialist

### 5.4.2 Arizona Public Service

Paul Herndon	Project Manager
Bob Smith	Transmission Planning
Jim Looney	Lands
Paul Richards	Transmission Construction

### 5.4.3 Environmental Planning Group

Garlyn Bergdale	Principal-in-Charge
Paul Trenter	Project Manager
Greg Bernosky	Project Coordinator, Socioeconomics, Earth and Water Resources, Health and Safety Resources
Newton DeBardleben	Land Use Resources
Marc Schwartz	Visual Resources and Simulations
Glenda Luhnnow	Cultural Resources
Bob Pape	Biological Resources
Rasmus Hansen	Geographic Information Systems

# CHAPTER 6

## CHAPTER 6 - REFERENCES

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# APPENDIX A

**APPENDIX A**  
**STANDARD CONSTRUCTION AND OPERATING**  
**PROCEDURES AND MITIGATION MEASURES**

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**APPENDIX A  
STANDARD CONSTRUCTION AND OPERATING PROCEDURES  
AND MITIGATION MEASURES**

- |   |
|---|
| 1. All construction vehicle movement outside of the right-of-way will be restricted to predesignated access, contractor acquired access, or public roads.   |
| 2. The limits of construction activities will typically 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. The right-of-way boundary will be flagged in environmentally sensitive areas described in the specific plan of development to alert construction personnel that those areas should be avoided.  |
| 3. In construction areas where recontouring is not required, vegetation will be left in place wherever possible to avoid excessive root damage and allow for resprouting.   |
| 4. In construction areas (e.g., marshalling yards, structure sites, spur roads from existing access roads) where ground disturbance is significant or where recontouring is required, surface restoration will occur as required by the landowner or land-management agency. The method of restoration will typically consist of returning disturbed areas to their natural contour (to the extent practical), reseeding or revegetating with native plants (if required), installing cross drains for erosion control, placing water bars in the road, and filling ditches. Seed must be tested and certified to contain no noxious weeds in the mix by the State of Arizona Agricultural Department. Seed viability must also be tested at a certified laboratory approved by the authorized officer. |
| 5. Watering facilities (e.g., tanks, developed springs, water lines, wells, etc.) will be repaired or replaced to their predisturbed conditions as required by the landowner or land-management agency if they are damaged or destroyed by construction activities.   |
| 6. Prior to construction, all construction personnel will be instructed on the protection of cultural, paleontological, and ecological resources. To assist in this effort, the construction contract will address (a) federal and state laws regarding antiquities, fossils, and plants and wildlife, including collection and removal; and (b) the importance of these resources and the purpose and necessity of protecting them.  |
| 7. Impact avoidance and mitigation measures for cultural resources developed in consultation with BLM and the ASLD will be implemented.   |
| 8. The project sponsors will respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigation measures. The transmission line will be patrolled on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced.   |
| 9. The project sponsors will apply necessary mitigation to minimize problems of induced currents and voltages onto conductive objects sharing a right-of-way, to the mutual satisfaction of the parties involved.   |
| 10. All construction and maintenance activities shall be conducted in a manner that will minimize disturbance to vegetation, drainage channels, and intermittent and perennial streambanks. In addition, all existing roads will be left in a condition equal to or better than their condition prior to the construction of the transmission line.   |
| 11. 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. Open burning of construction debris (cleared trees, etc.) will not be allowed on BLM administered lands.   |

12. Fences and gates, if damaged or destroyed by construction activities, will be repaired or replaced to their original undisturbed condition as required by the landowner or the land-management agency. Temporary gates will be installed only with the permission of the landowner or the land-management agency, and will be restored to their original undisturbed condition following construction.
13. The proposed hardware and conductor will limit the audible noise, radio interference (RI), and television interference (TVI) due to corona. Tension will be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Caution will be exercised during construction to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.
14. During operation of the transmission line, the right-of-way will be maintained free of construction related non-biodegradable debris.
15. Totally enclosed containment will be provided for all debris. All construction waste including debris, litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials will be removed to a disposal facility authorized to accept such materials.
16. Structures will be constructed to conform to "Suggested Practices for Raptor Protection on Power Lines" (Avian Power Line Interaction Committee 1996).
17. Species protected by the Arizona Native Plant Law will be salvaged. A salvage plan approved by the BLM will be included in the specific plan of development. Generally, salvage may include: <ul style="list-style-type: none"> <li>■ removal and stockpiling for replanting on site</li> <li>■ removal and transplanting out of surface disturbance area</li> <li>■ removal and salvage by private individuals</li> <li>■ removal and salvage by commercial dealers</li> <li>■ any combination of the above</li> </ul>
18. The alignment of any new access roads or overland routes will follow the designated area's landform contours where possible, providing that such alignment does not additionally impact resource values. This would minimize ground disturbance and reduce scarring.
19. All new access roads not required for maintenance will be permanently closed using the most effective and least environmentally damaging methods appropriate to that area with concurrence of the landowner or land manager (e.g., stock piling and replacing topsoil, or rock replacement). This would limit access into the area. Fencing, signing, and other closure methods will be determined by the BLM and paid for by the contractor or APS.
20. In designated areas, structures will be placed or rerouted so as to avoid sensitive features such as, but not limited to, riparian areas, watercourses, and cultural sites, or to allow conductors to clearly span the features, within limits of standard tower design.
21. Transmission line structures will comply with Federal Aviation Administration Guidelines to minimize aircraft hazards (Federal Aviation 77).
22. Special status species or other species of particular concern will continue to be considered during the construction phase of the Project, in accordance with management policies set forth by the BLM and other appropriate land management agencies. This will entail monitoring for plant and wildlife species of concern along the proposed transmission line and associated facilities (i.e., access roads and staging areas). In cases where such species are identified, appropriate action will be taken to avoid adverse impacts on the species and its habitat.
23. The contractor or APS will submit to BLM a proposed road development plan for inclusion in the Plan of Development for the alignment between Burnt Mountain (Links 60/70) and Link 110. The goal of the plan is to limit new road construction to a minimum and discourage an east to west travel corridor.

# APPENDIX B

**APPENDIX B**  
**VISUAL RESOURCES**

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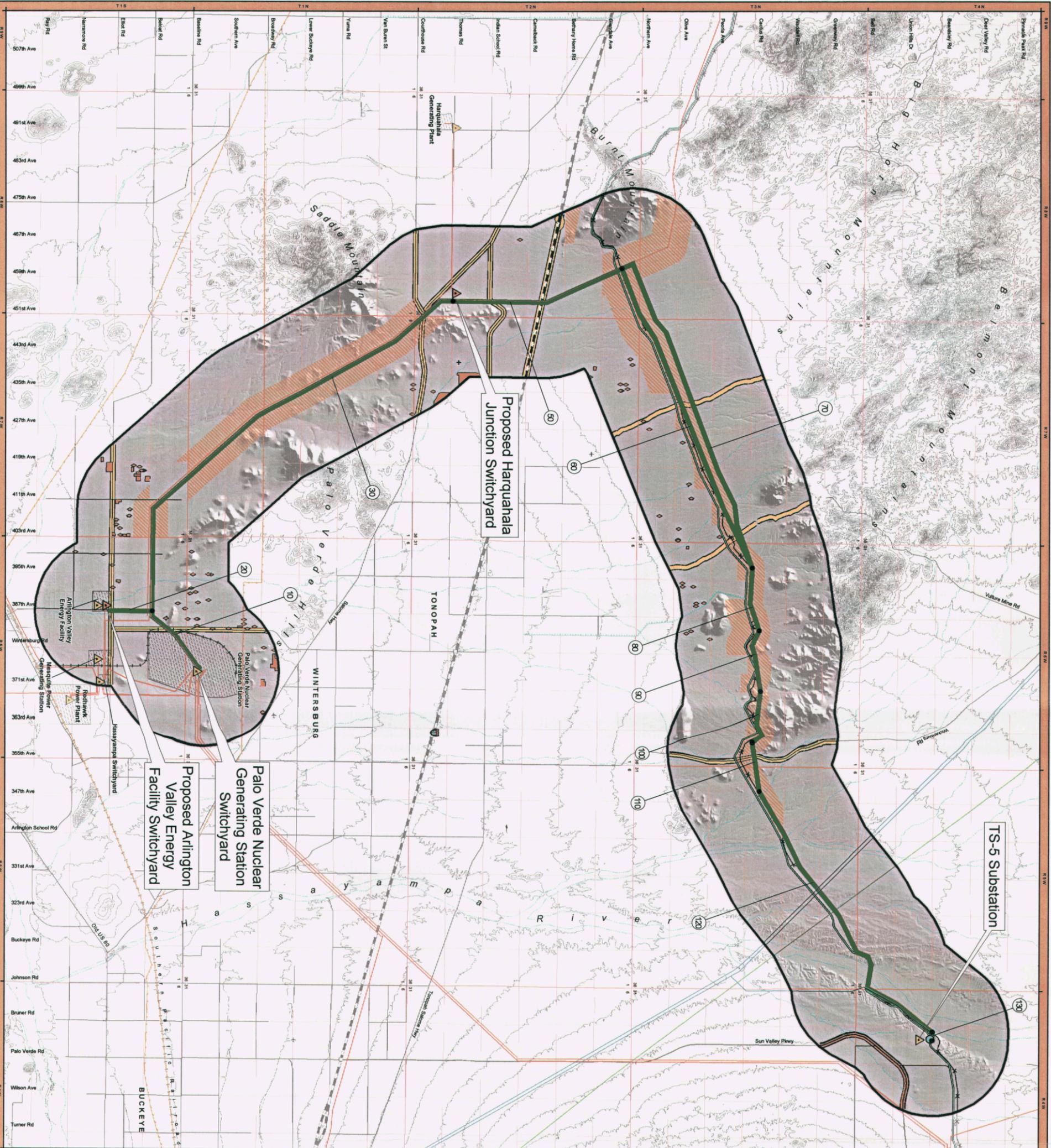
## APPENDIX B VISUAL RESOURCES

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### VISUAL RESOURCE MANAGEMENT OBJECTIVES

BLM Visual Resource Management (VRM) classes are assigned to specific landscapes by the BLM that direct acceptable levels of visual intrusions within each class. VRM class guidelines are as follows:

- **Class I Objective.** The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **Class II Objective.** The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **Class III Objective.** The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **Class IV Objectives.** The objective of this class is to provide for management activities, which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.



**PALO VERDE HUB  
TO TS-5 500KV  
TRANSMISSION PROJECT  
Existing Key Observation  
and Simulation Points**

**FIGURE B-1**

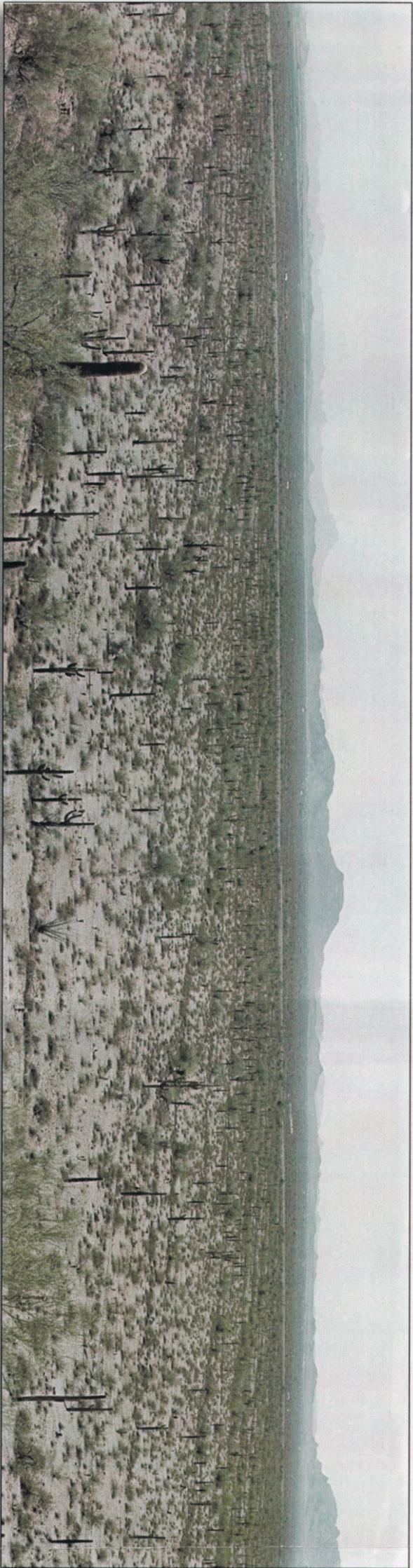
- Legend**
- High Sensitivity KOP
  - High Sensitivity Travel Route KOP
  - Individual Residential KOP
  - Moderate Sensitivity KOP
  - Moderate Sensitivity Travel Route KOP
  - Simulation Point Location

- Reference Features**
- |                                    |                                      |
|------------------------------------|--------------------------------------|
| Study Area                         | Existing/Proposed Switchyard/Station |
| Proposed Action                    | Proposed Switchyard/Station          |
| Link Number                        | Interchange                          |
| Link Node                          | Road                                 |
| Designated Utility Corridor (DULC) | Railroad                             |
| Existing Power Plant               | CAP Northern Fence Line              |
| 500kV Transmission Line            | CAP Canal                            |
| 345kV Transmission Line            | Canal                                |
| 220kV Transmission Line            | Hassayampa Pumping Plant             |
| Pipeline                           | Stream/Arroyo/Wash                   |
|                                    | Airport/Heliport                     |

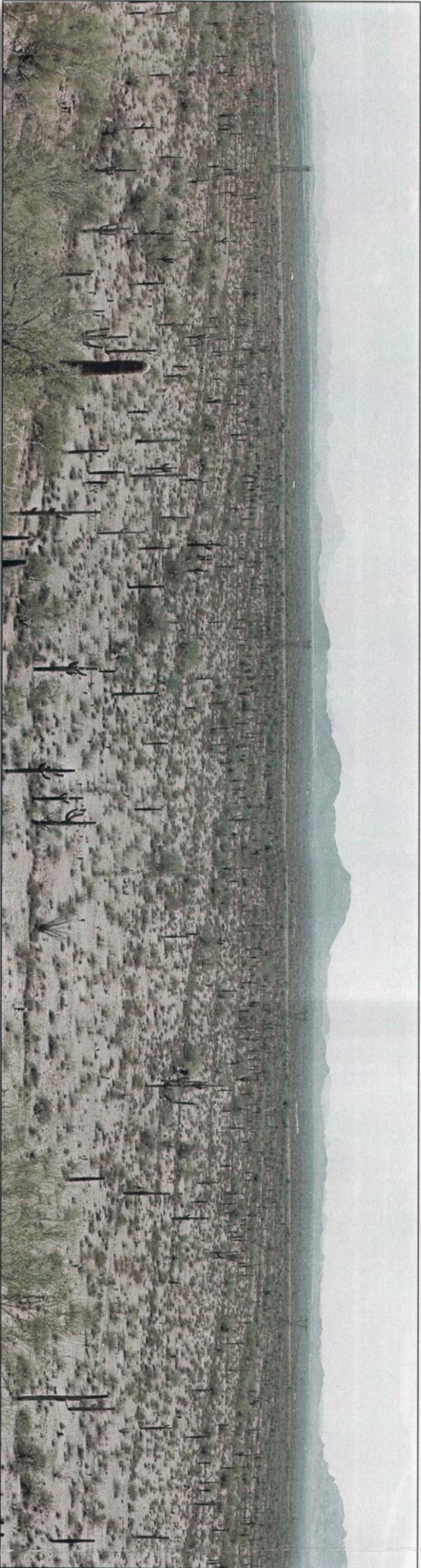
**Sources**

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- AZ Department of Transportation (2005).
- US Bureau of Land Management (2005).

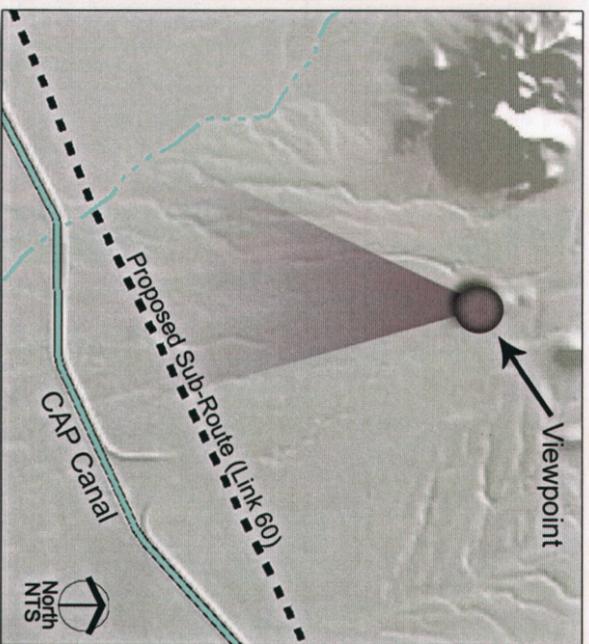
May 2, 2005



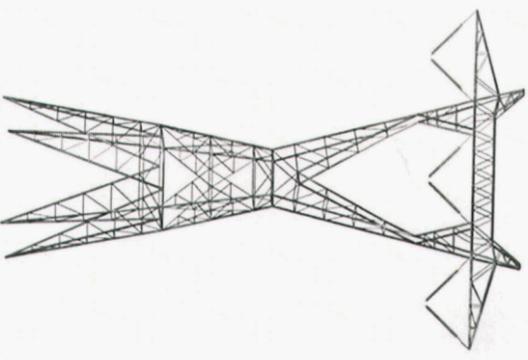
**Existing Conditions - View looking south towards the CAP in the desert plains with the Palo Verde Hills in the background.**  
 Photograph taken 8/15/04 at 2:15 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP (Link 60) within a BLM-designated utility corridor.**



Viewpoint located approximately 5,400 feet north of the Proposed Sub-Route (Link 60).

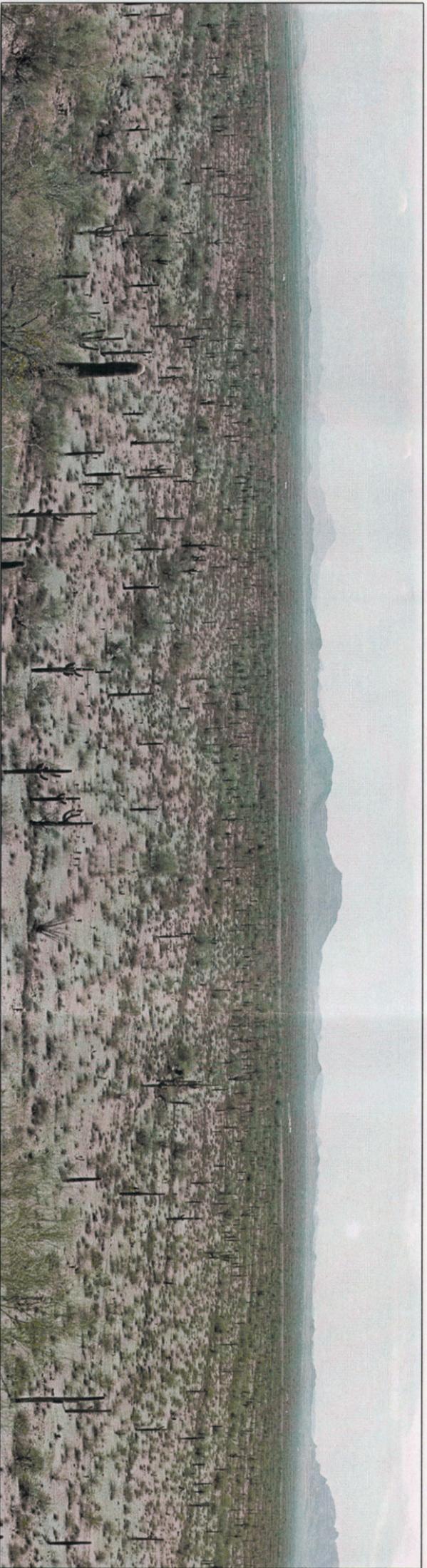


Typical 500kV single-circuit 135' steel lattice tower used in simulations

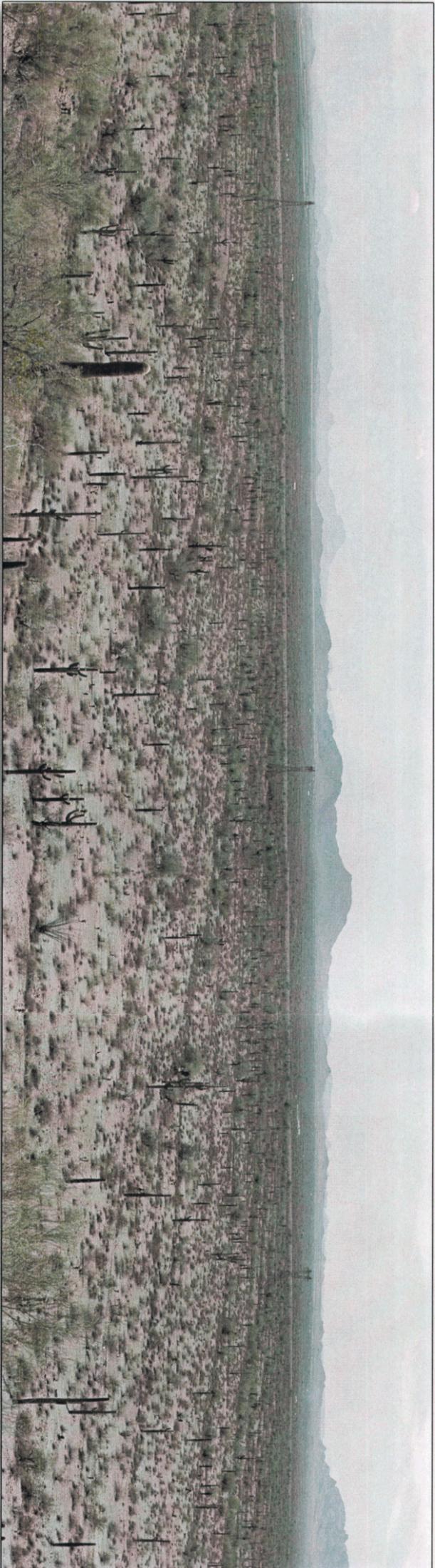
**Palo Verde Hub to TS-5  
 500kV Transmission Project**



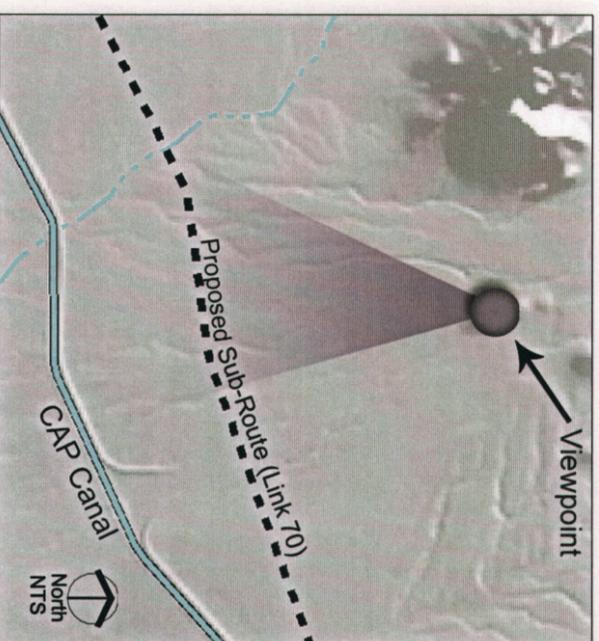
Figure B-2



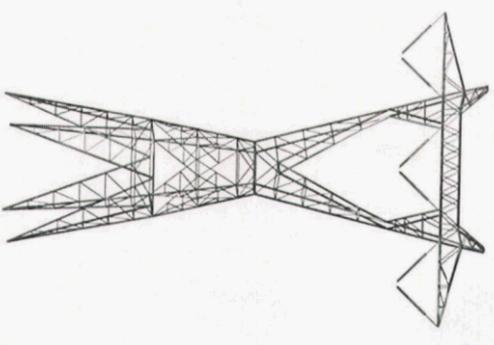
**Existing Conditions - View looking south towards the CAP in the desert plains with the Palo Verde Hills in the background.**  
 Photograph taken 8/15/04 at 2:15 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP (Link 70) within a BLM-designated utility corridor.**



Viewpoint located approximately 4,800 feet north of the Proposed Sub-Route (Link 70).

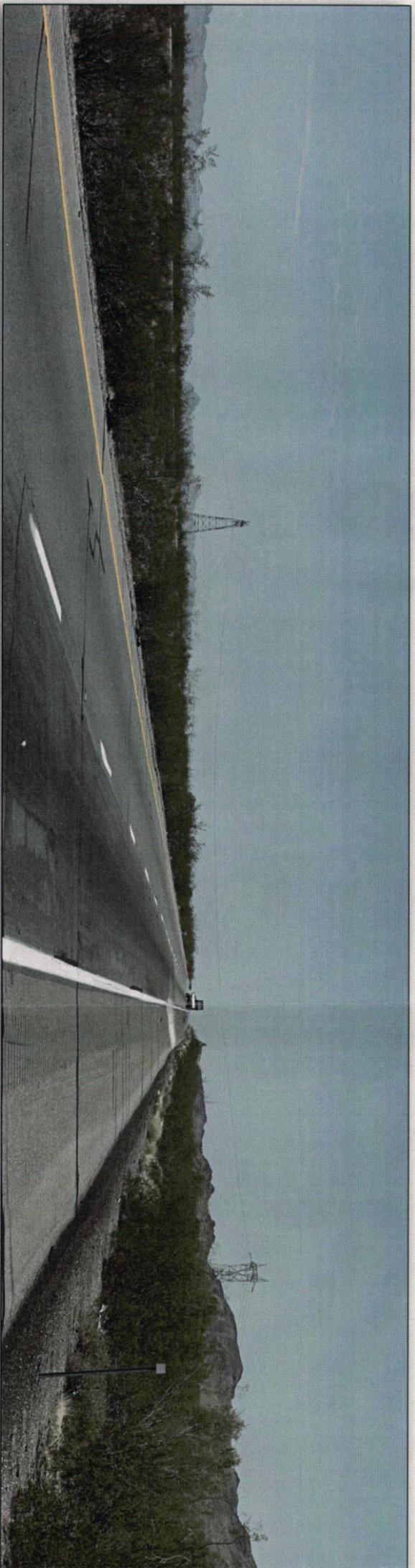


Typical 500kV single-circuit 135' steel lattice tower used in simulations

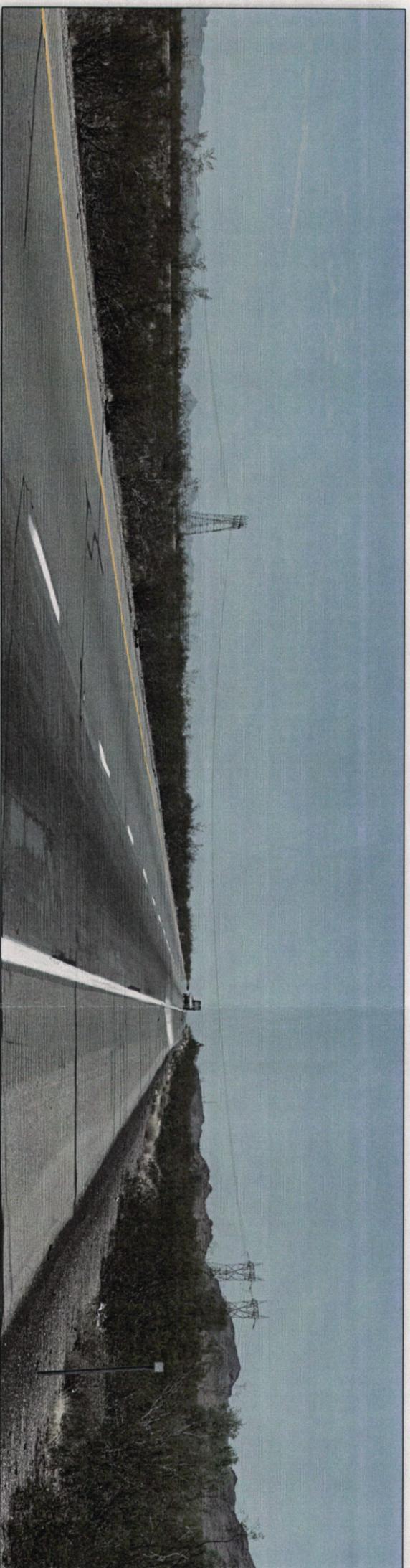
**Palo Verde Hub to TS-5  
 500kV Transmission Project**



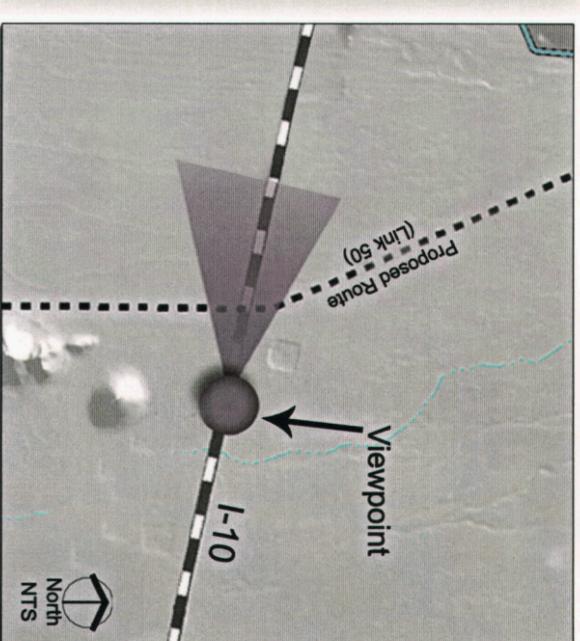
Figure B-3



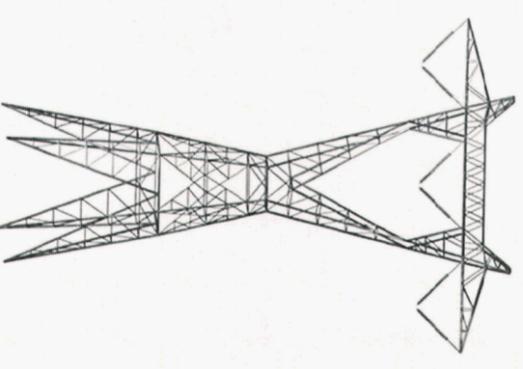
**Existing Conditions - View looking west towards the existing 500kV transmission line crossing Interstate 10.**  
 Photograph taken 7/26/04 at 12:26 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line paralleling east of the existing 500kV transmission line (Link 50).**



Viewpoint located approximately 3,200 feet east of Proposed Route along westbound Interstate 10 (Link 50).

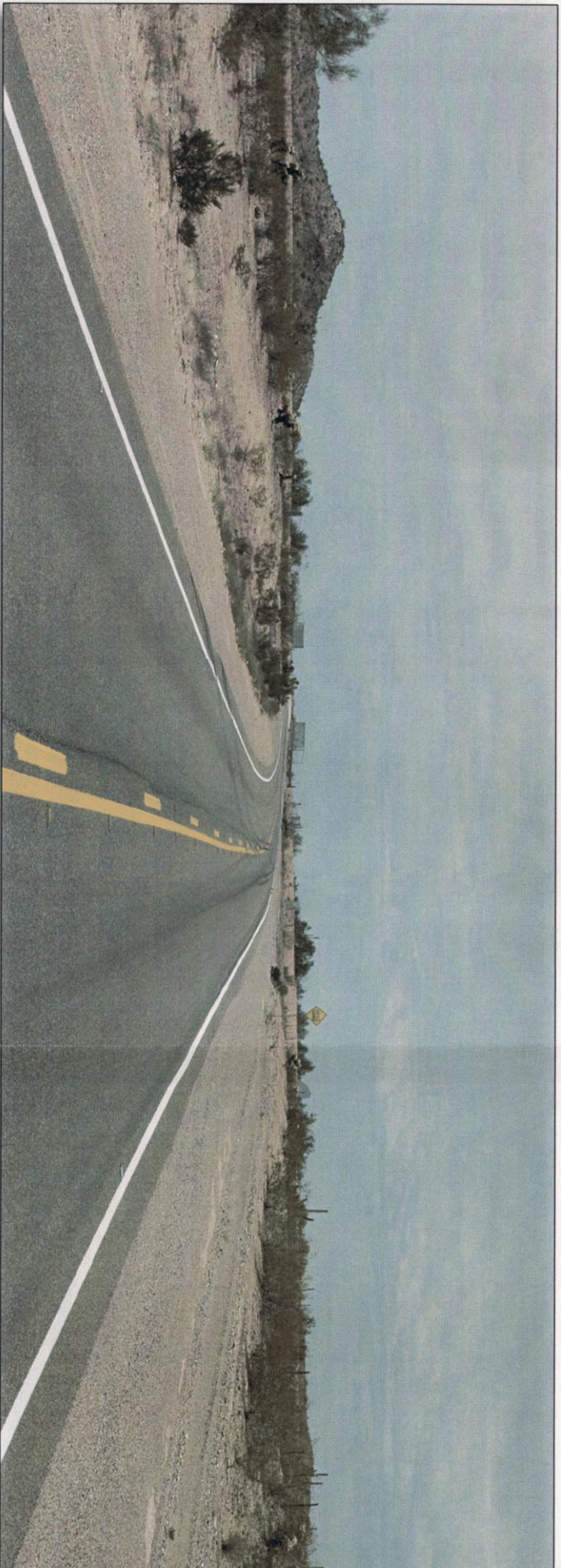


Typical 500kV single-circuit steel lattice tower used in simulations

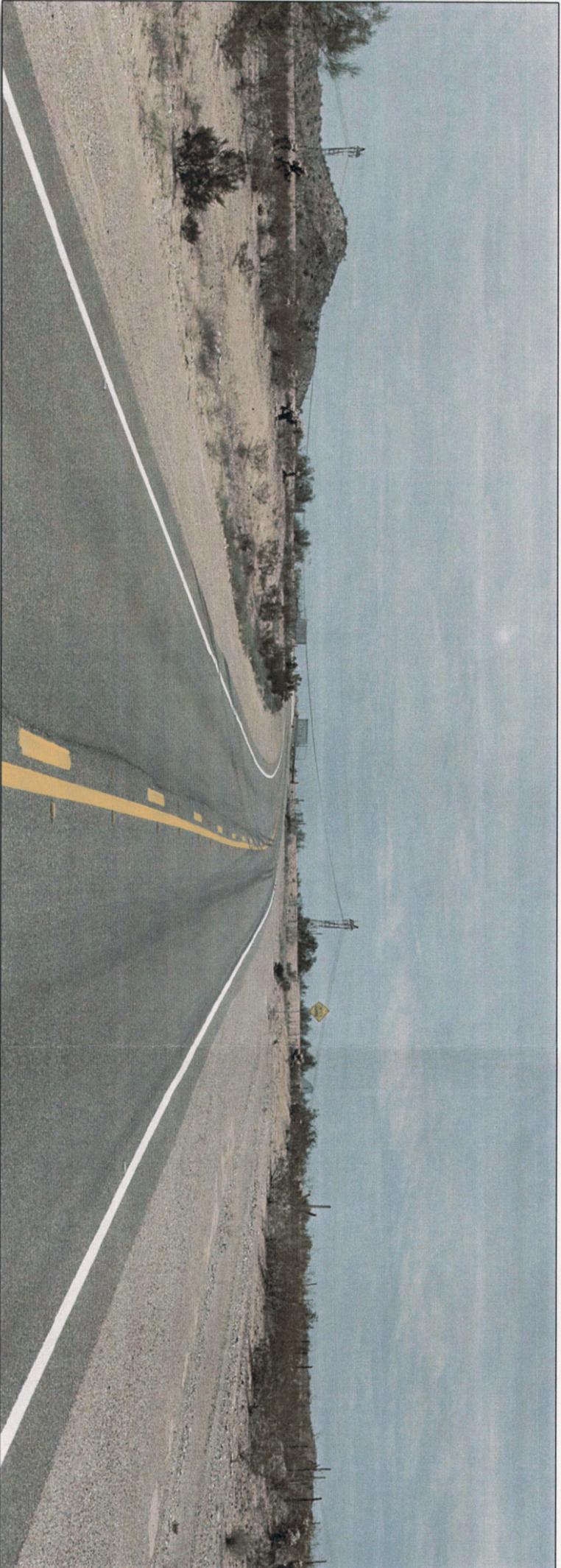
**Palo Verde Hub to TS-5  
 500kV Transmission Project**



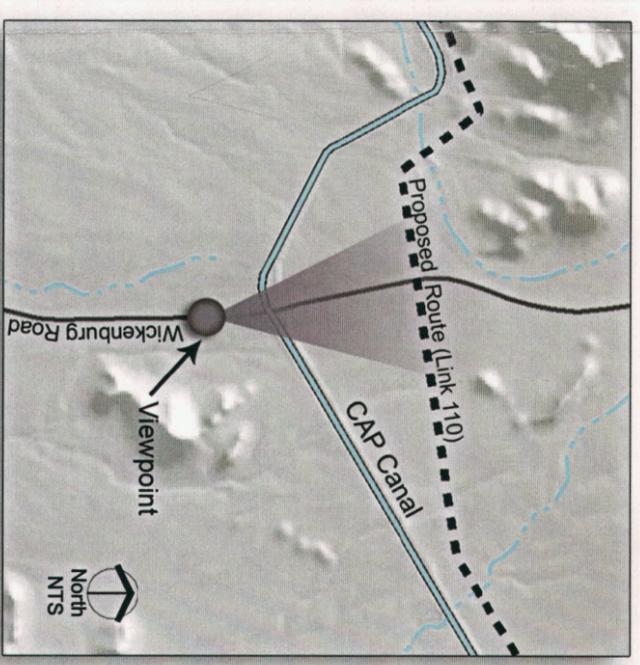
Figure B-4



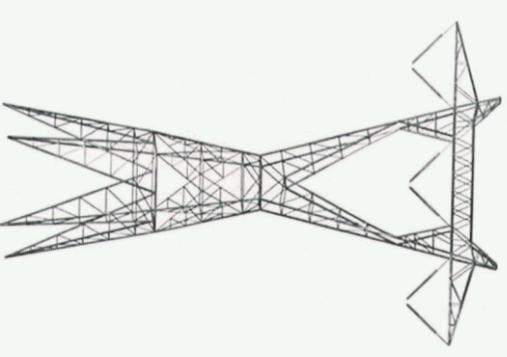
**Existing Conditions - View looking north on Wickenburg Road towards CAP Canal.**  
 Photograph taken 8/4/04 at 11:41 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line crossing Wickenburg Road north of the CAP within a BLM-designated utility corridor (Link 110).**



Viewpoint located approximately 4,000 feet south of the Proposed Route along northbound Wickenburg Road (Link 110).

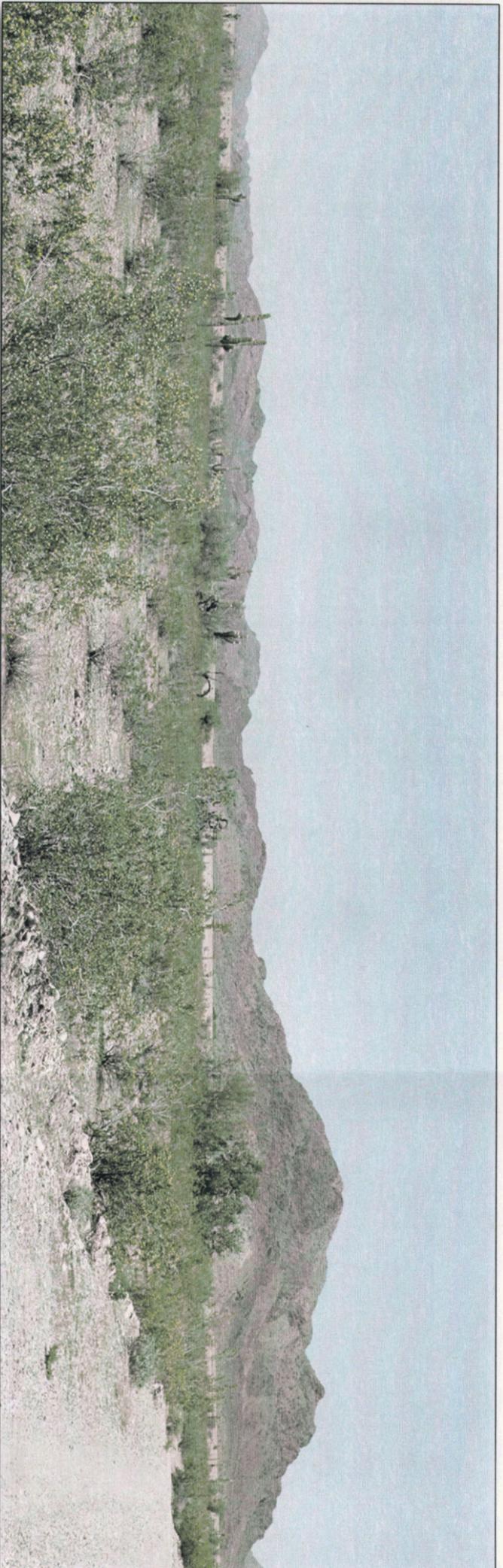


Typical 500kV single-circuit 135' steel lattice tower used in simulations

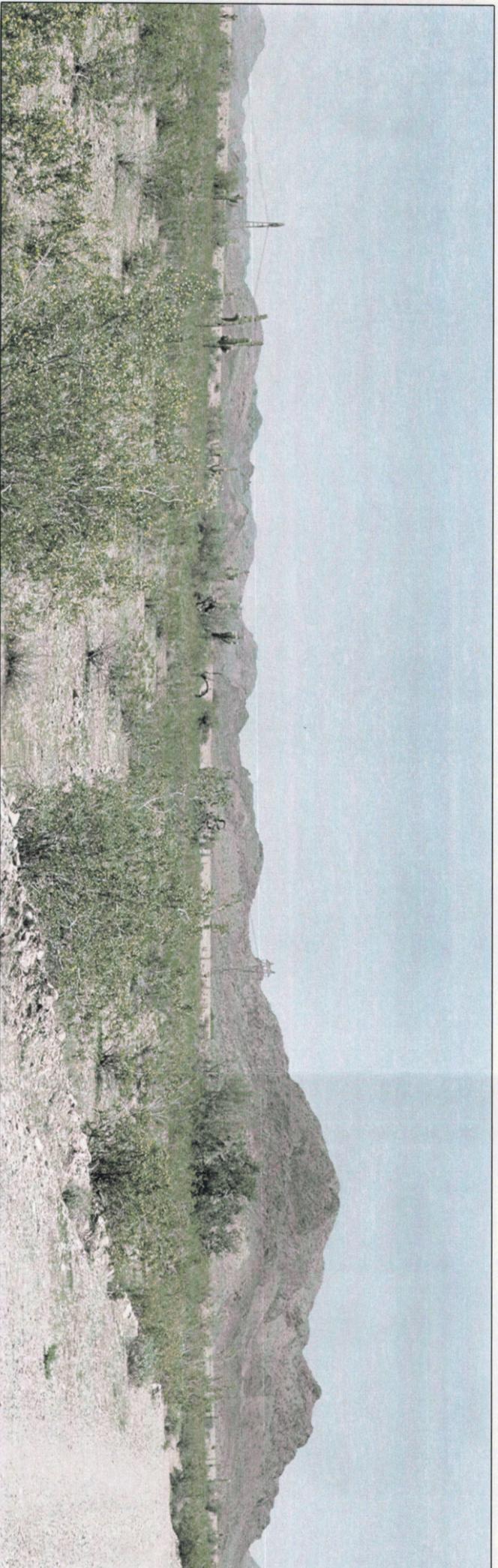
**Palo Verde Hub to TS-5  
 500kV Transmission Project**



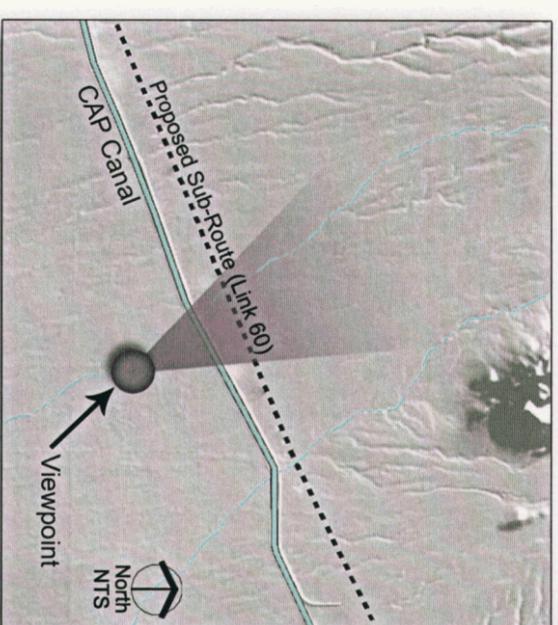
Figure B-5



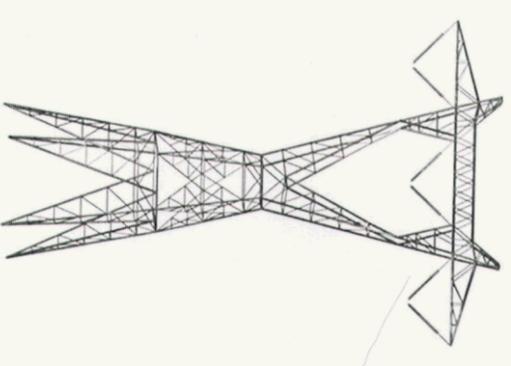
**Existing Conditions - View looking north towards CAP berm and the Belmont Mountains.**  
 Photograph taken 8/15/04 at 12:27 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP (Link 60) within a BLM-designated utility corridor.**



Viewpoint located adjacent to a residence approximately 3,300 feet south of the Proposed Sub-Route (Link 60).



Typical 500kV single-circuit 135' steel lattice tower used in simulations

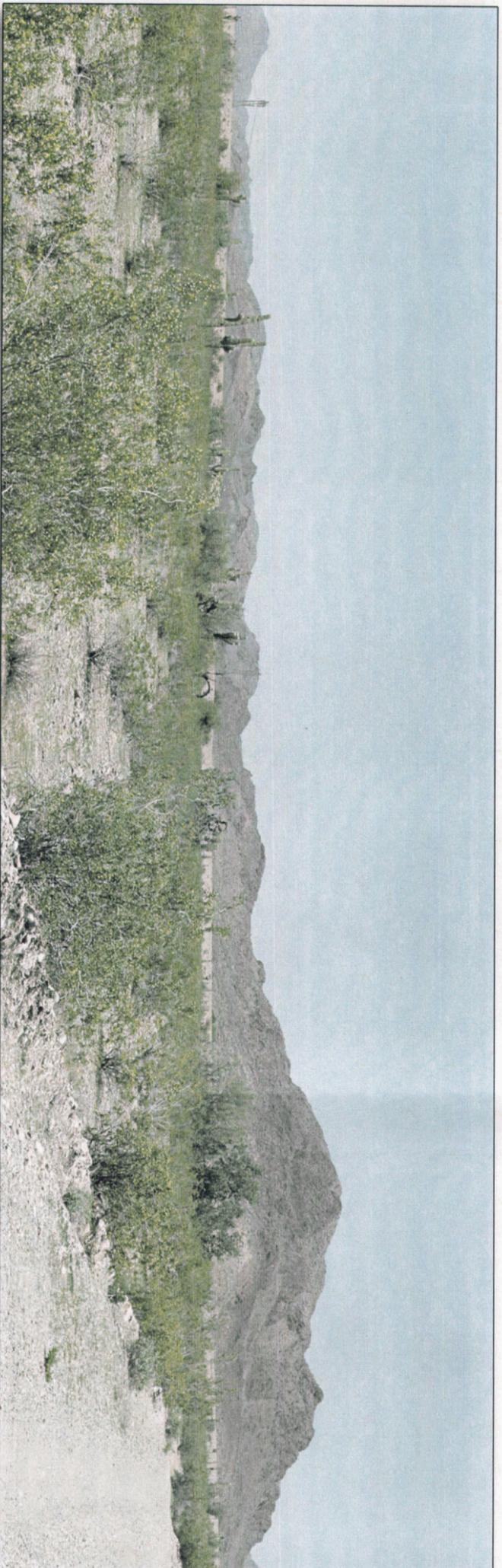
**Palo Verde Hub to TS-5  
 500kV Transmission Project**



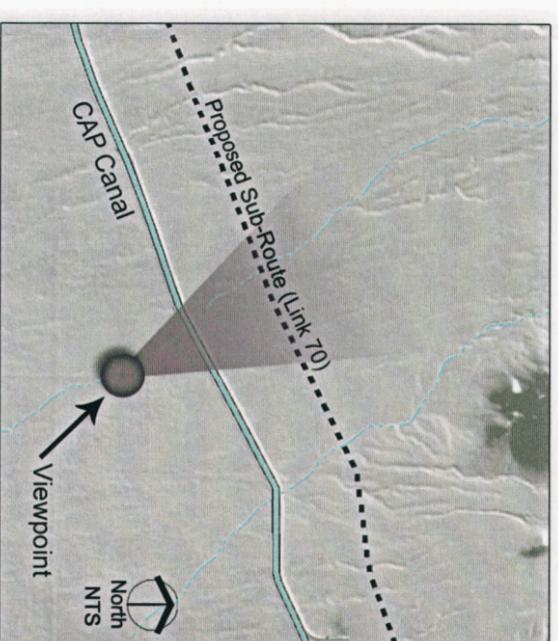
Figure B-6



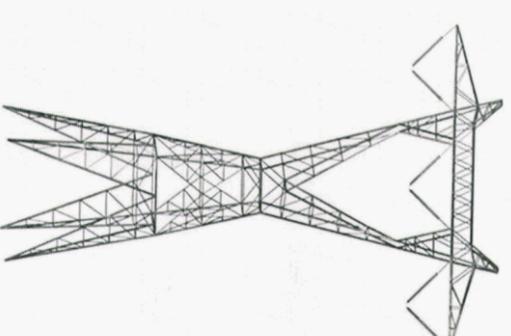
**Existing Conditions - View looking north towards CAP and the Belmont Mountains.**  
 Photograph taken 8/15/04 at 12:27 p.m. using a 50mm focal length.



**Simulation - Proposed single-circuit 500kV dull grey steel lattice transmission line north of the CAP (Link 70) within a BLM-designated utility corridor.**



Viewpoint located adjacent to a residence approximately 4,500 feet south of the Proposed Sub-Route (Link 70).



Typical 500kV single-circuit 135' steel lattice tower used in simulations

**Palo Verde Hub to TS-5  
 500kV Transmission Project**



Figure B-7

# APPENDIX C

**APPENDIX C**  
**BIOLOGICAL RESOURCES**

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**APPENDIX C - BIOLOGICAL RESOURCES**

Special status species that are known to be present, or that have reasonable potential to be present within the study area based on known distribution or habitat requirements, are noted in Table C-1. Potential impacts to these species have been described in Section 3.5.2 of this EA.

TABLE C-1 SPECIAL STATUS WILDLIFE AND PLANT SPECIES THAT COULD OCCUR WITHIN THE STUDY AREA							
Common Name	Scientific Name	Habitat	Federal Status	BLM	State of Arizona	NPL	Probability of Presence
<b>MAMMALS</b>							
California leaf-nosed bat	<i>Macrotus californicus</i>	Sonoran desertscrub with caves or mines.	SC	S	WC		Moderate
Cave myotis	<i>Myotis velifer</i>	Roosts primarily in mines or caves in xeric habitats such as creosote bush or palo verde mixed scrub plant associations. Requires a permanent water source within a few miles of roost.	SC	S			Low
Pale Townsend's big-eared bat	<i>Plecotus (Corynorhinus) townsendii pallascens</i>	Areas with caves, mines, or structures for night roosts, from desertscrub up into coniferous forest.	SC				Moderate
Pocketed free-tailed bat	<i>Nyctinomops femorosaccus</i>	Occurs in high cliffs in rugged rocky country, but it has also been found associated with buildings.		S			Low
Feral burro	<i>Equus asinus</i>	Lower Colorado River Valley and Arizona Upland subdivisions of the Sonoran desertscrub in western Arizona.	USC				Moderate
<b>BIRDS</b>							
American peregrine falcon	<i>Falco peregrinus anatum</i>	Open areas with perches providing good visibility. Found in almost any habitat.	SC		WC		Low

**TABLE C-1  
SPECIAL STATUS WILDLIFE AND PLANT SPECIES  
THAT COULD OCCUR WITHIN THE STUDY AREA**

Common Name	Scientific Name	Habitat	Federal Status	BLM	State of Arizona	NPL	Probability of Presence
<b>BIRDS Cont.</b>							
Western burrowing owl	<i>Athene cunicularia hypugia</i>	Open country, agricultural areas, golf courses, and airports.	SC	S			Moderate
<b>AMPHIBIANS AND REPTILES</b>							
Desert tortoise (Sonoran population)	<i>Gopherus agassizii</i>	Completely terrestrial desert species requiring firm, but not hard, ground for construction of burrows, frequents desert oases, riverbanks, washes, and rocky slopes.	SC		WC		High
Common chuckwalla	<i>Sauromalus ater</i>	Rock-dwelling, herbivorous lizard, widely distributed in the desert.	SC	S			Low
<p>Key: Federal Status: LE = Endangered LT = Threatened C = Candidate SC = Species of concern DM = Delisted taxon, recovered, being monitored for first five years.                      BLM Status: S = Arizona special status species. HS = Highly Safeguarded (Native Plant Law)                      State Status: WC = Wildlife of special concern in Arizona. HS = Highly Safeguarded (Native Plant Law)                      USC: United States Code - Title 16 - Conservation - Chapter 30 - Wild horses and Burros: Protection, Management, and Control.</p> <p>Sources: ADA 2004; AGFD 2004a, 2004b; AOU 1998; ARPC 2001; Burt and Grossenheider 1980; Degenhardt et al. 1996; Glinski 1998; Harvey et al. 1999; Hoffmeister 1986; Howard 1995; ITIS 2004; Kearney and Peebles 1960; Minckley 1973; NGS 2002; Pavek 1993; Pearson and Wismann 1995; Sogge et al. 1997; Stebbins 2003; Wheeler 2003.</p>							

A list of plants observed as occurring in the project study area during site visits are noted in Table C-2.

<b>TABLE C-2 SITE PLANT LIST</b>	
<b>Scientific Name</b>	<b>Common Name</b>
<i>Abutilon berlandieri</i>	Berlandier Indian mallow
<i>Acacia greggii</i>	Catclaw acacia
<i>Ambrosia ambrosioides</i>	Canyon ragweed
<i>Ambrosia deltoidea</i>	Triangle bursage
<i>Ambrosia dumosa</i>	White bursage
<i>Amsinckia</i> sp.	Fiddleneck
<i>Atriplex polycarpa</i>	Desert saltbush
<i>Baccharis sarothroides</i>	Desert broom
<i>Bebbia juncea</i>	Sweetbush
<i>Brandegea bigelovii</i>	Desert starvine
<i>Carnegiea gigantea</i>	Saguaro
<i>Chamaesyce albomarginata</i>	Rattlesnake weed
<i>Chorizanthe rigida</i>	Rigid spiny herb
<i>Clematis drummondii</i>	Drummond clematis
<i>Cynodon dactylon</i>	Bermuda grass
<i>Datura</i> sp.	Datura
<i>Echinocereus engelmannii</i>	Strawberry hedgehog
<i>Encelia farinosa</i>	Brittlebush
<i>Eriogonum</i> sp.	Buckwheat
<i>Erodium cicutarium</i>	Filaree
<i>Ferocactus cylindraceus</i>	California barrel cactus
<i>Fouquieria splendens</i>	Ocotillo
<i>Funastrum cynanchoides</i>	Twinevine
<i>Hiptis emoryi</i>	Desert lavender
<i>Hymenoclea salsola</i>	Burrobrush
<i>Isocoma tenuisecta</i>	Burroweed
<i>Krameria grayi</i>	White ratany
<i>Krameria erecta</i>	Range ratany
<i>Larrea tridentata</i>	Creosote bush
<i>Lycium andersonii</i>	Anderson wolfberry
<i>Lycium berlandieri</i>	Berlandier wolfberry
<i>Olneya tesota</i>	Ironwood
<i>Opuntia acanthocarpa</i>	Buckhorn cholla
<i>Opuntia bigelovii</i>	Teddybear cholla
<i>Opuntia leptocaulis</i>	Christmas cactus
<i>Parkinsonia florida</i>	Blue paloverde
<i>Parkinsonia microphylla</i>	Littleleaf paloverde
<i>Prosopis velutina</i>	Velvet mesquite
<i>Simmondsia chinensis</i>	Jojoba
<i>Sphaeralcea coulteri</i>	Coulter globemallow
<i>Tetracoccus hallii</i>	Hall's shrubby spurge
<i>Verbesina encelioides</i>	Golden crownbeard
<i>Zizyphus obtusifolia</i>	Gray thorn

# APPENDIX D

**APPENDIX D**  
**PUBLIC CONTACT INFORMATION**

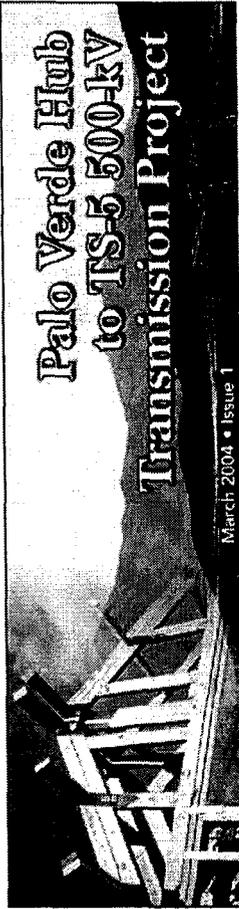
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Mail Station 8528  
P.O. Box 53999  
Phoenix, AZ 85072

IMPORTANT INFORMATION  
FOR PROPERTY OWNERS

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# Palo Verde Hub to TS-5 500-kV Transmission Project

March 2004 • Issue 1

## APS Proposes New Transmission Facilities

APS has plans to build a new 500-kilovolt (500-kV) transmission line and substation in the far west and northwest areas of the valley, where unprecedented growth is occurring.

According to a February 2004 issue of *The Phoenix Business Journal*, the West Valley will be home to about 250,000 new homes over the next 50 years. In addition, the average household usage of electricity in Arizona has increased about 21 percent over the past decade. Growth figures like these underscore the need to build new electrical facilities.

APS' 500-kV project will provide the electrical transmission infrastructure that will bring bulk power into this high-growth area. It provides the electrical source to feed the 230-kV transmission system that will be needed in the area. The project also will strengthen the entire APS

transmission system by providing an additional high-voltage transmission source to the Phoenix Metropolitan area, allowing the import of power from generating sources at or around the Palo Verde Nuclear Generating Station (PVNGS).

### Project Description

The proposed transmission line will be between 40 to 45 miles in length and will be constructed on either tubular steel poles or lattice towers, typically between 130 to 150 feet high. The project will begin at the PVNGS hub and will terminate at a new 500/230-kV substation in the Sun Valley area (see map in this newsletter).

### State and Federal Components of Project

In the first quarter of 2003, APS began working with the Bureau of Land Management (BLM), The Phoenix Field Office. The

### In This Issue

- Project Description
- State and Federal Components
- Proposed Route
- Environmental Process
- Public Participation
- Project Schedule

For More Information visit the Project Web site at <http://sting.apsc.com> or call the project information line at (602) 794-9000.



## Palo Verde Hub to TS-5 500-kV Transmission Project

Please attend the upcoming

### Public Information Open House

6 to 8 p.m. - Tuesday, March 30, 2004

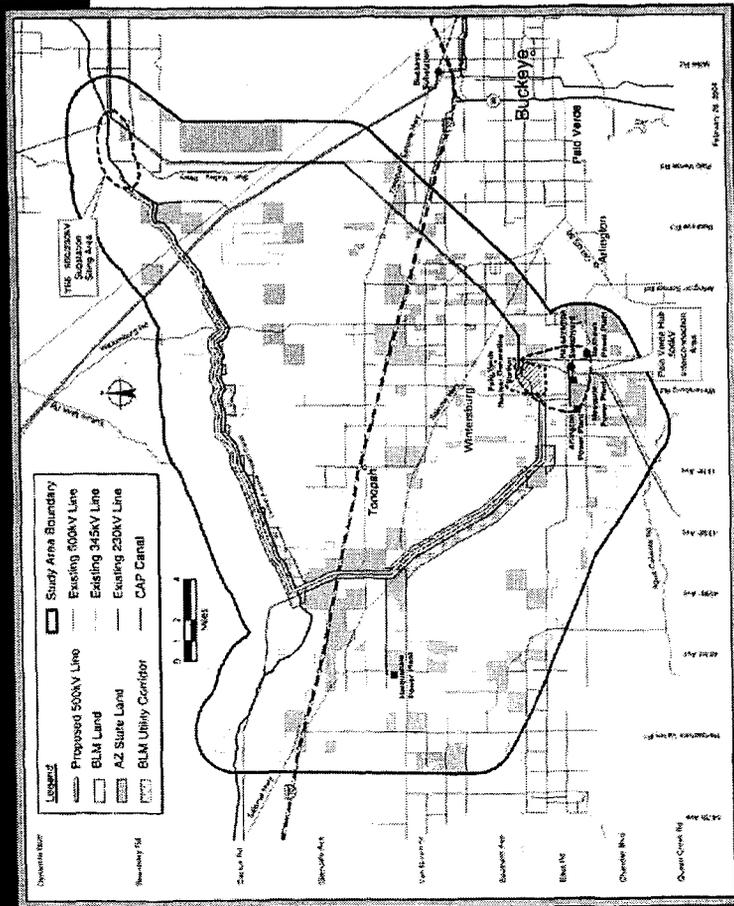
Ruth Fisher Elementary School  
38201 W. Indian School Road  
Tonopah, Arizona 85354

If you are unable to attend the open house, please visit our web site at <http://sting.apsc.com> or call (602) 794-9000 to learn more about the project.



Questions? Call (602) 794-9000 or visit our Web site at <http://sting.apsc.com>

## Palo Verde Hub to TS-5 500-kV Transmission Project



bureau had begun updating its resource management plans, which included designating utility corridors through their federal lands. One of these plans, the Bradshaw - Harquahala Range Plan, includes part of the study area for APS' 500-kV project. The BLM's final draft plan is expected to include APS' recommendations that the existing Devers - Palo Verde 500-kV transmission line and the Central Arizona

Project be included in a one-mile wide designated utility corridor (see map).

Because APS proposes that the new 500-kV power line, in part, be located on federal land, adherence to the National Environmental Policy Act (NEPA) is required. APS has filed a right-of-way application on the proposed project and, as required under NEPA, APS will conduct an

Environmental Assessment (EA) as part of that right-of-way application process.

In addition to the federal planning requirements for the project, APS will prepare a Certificate of Environmental Compatibility (CEC) application for state permitting of the project. This application will be filed with the Arizona Power Plant and Transmission Line Siting Committee, which will hold public hearings on the project. The CEC application documents the proposed project's purpose and need, description, cost, federal and state permitting efforts, associated environmental issues and the public outreach efforts.

The state siting committee makes a formal recommendation on the project to the Arizona Corporation Commission, which makes a final determination on a power line route and substitution location.

### Proposed Route

APS' proposed 500-kV line would begin at one of several interconnection points at the Palo Verde hub and parallel the existing Devers - Palo Verde 500-kV power line for approximately 18 miles, 10 of which would be within the proposed one-mile-wide BLM designated utility corridor. The proposed route would then parallel the CAP canal for approximately 23 miles, 17

of which would be within another BLM one-mile-wide utility corridor.

### Environmental Process

APS has retained an outside environmental consulting firm, the Environmental Planning Group (EPG), based in Phoenix, to conduct the required environmental analysis on the project. EPG will conduct five primary tasks:

- 1) Regional study/identification of preliminary alternatives;
- 2) Detailed inventory;
- 3) Impact assessment and mitigation planning;
- 4) Environmental assessment report preparation; and
- 5) Preparation of the CEC application.

### Public Information

The public is invited to learn more about the project in several ways:

- Open houses, with their informal formats allow project team members one-on-one and talk through the latest project information.
- Project information will be posted at <http://siting.aps.com>.
- Newsletters will be mailed to APS customers, landowners and others with interest in the project area.

• The project telephone information line at (602) 794-9000 also will carry up-to-date information.

• The federal NEPA and state siting processes are also public and allow various levels of comment opportunities and involvement.

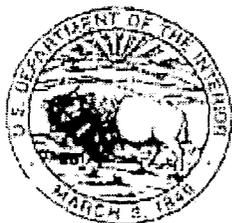
### First Project Open House

The first project open house will be held March 30, 2004, at Ruth Fisher Elementary School, 38201 W. Indian School Road. The public may attend any time between 6 and 8 p.m. to talk one-on-one with project team members. We look forward to seeing you there.

### Project Schedule

While the project informally began through discussions with the BLM in early 2003, the environmental planning, public, state and NEPA processes will extend into the fourth quarter of 2004. APS plans to file for a Certificate of Environmental Compatibility (CEC) with the Arizona Corporation Commission in late 2004, with state siting hearings anticipated in the first quarter of 2005. The entire project is planned to be completed and operational by the summer of 2007.





# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Phoenix Field Office  
21605 North 7th Avenue  
Phoenix, AZ 85027

In reply refer to:

2800 (020)  
AZA-32639

March 24, 2004

### **Request for Comments for the Proposed Right-of-Way for the Arizona Public Service Palo Verde Hub to TS 5 Transmission Project, Maricopa County, Arizona.**

#### **INTRODUCTION**

The Bureau of Land Management (BLM) requests your comments relating to the proposed Right-of-Way (RW) on public lands for the Arizona Public Service (APS) – TS 5 Project located in Maricopa County, Arizona (see enclosed project map).

The purpose of this mailer is to notify potentially interested parties including local, state, and federal agencies and adjacent land owners of the proposed project. All comments must be received by April 30, 2004, and will be reviewed as part of the environmental analysis for the project. At this time, the BLM has decided to prepare an Environmental Assessment (EA) to determine whether or not the project will have significant environmental effects. The EA is expected to be available for public comment by first quarter of 2005.

#### **PROPOSED ACTION**

The Proposed Action involves one 500 kV transmission power line on steel pole and/or lattice structures which would be constructed within a RW that is approximately 200 feet in width and approximately 40 to 45 miles in length, including approximately 26 miles of BLM administered land. The proposed RW, as it affects public land, would be built within the Palo Verde to Devers utility corridor as identified in the Lower Gila South Resource Management Plan (1988) and the Central Arizona Project (CAP) utility corridor as identified in the Lower Gila North Management Framework Plan (1983). The proposed action requires environmental compliance subject to the National Environmental Policy Act (NEPA).

The RW of the proposed action would directly impact up to approximately 630 acres of public lands.

#### **DECISION TO BE MADE**

The decision to implement the Proposed Action involves the BLM, which has jurisdiction for approximately 630 acres of public lands involved in the project.

Implementation of the Proposed Action will depend on the following: 1) BLM Field Manager reviews the EA, including comments received, and documents the decision in a Decision Record that contains a Finding of No Significant Impact (FONSI); or 2) makes the decision to prepare an Environmental Impact Statement (EIS).

## ISSUES

At a minimum, the EA will discuss the existing conditions of each resource and environmental consequences of the Alternative(s) on the following issues:

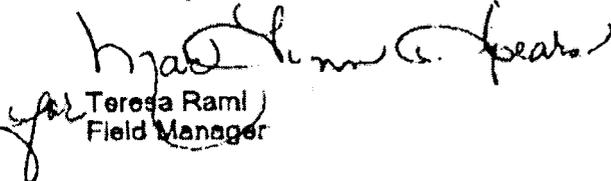
- Biological Resources (plants, wildlife, threatened and endangered species, and livestock grazing)
- Cultural Resources (archaeological sites)
- Land Use (recreation, access, R/W, etc.)
- Socio-economics
- Physical Resources (waters of the U.S., ground/surface water use, air quality, etc.)
- Visual Resources

## NEPA PROCESS

- 30-day public comment period
- Preparation of EA
- Decision Record issued
- Public Protest & Appeal Period

If you have any questions, please contact Camille Champion at (623) 580-5526.

Sincerely,

  
for Teresa Rami  
Field Manager

Enclosure  
(1) Project Map



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Phoenix Field Office  
21605 North 7th Avenue  
Phoenix, AZ 85027

In reply refer to:

2800 (020)  
AZA-32639

September 15, 2004

### **Request for Comments for the Updated Proposed Right-of-Way for the Arizona Public Service Palo Verde Hub to TS5 Transmission Project, Maricopa County, Arizona.**

#### **INTRODUCTION**

The Bureau of Land Management (BLM) requests your comments relating to the updated proposed Right-of-Way (R/W) on public lands for the Arizona Public Service (APS) – TS5 Project located in Maricopa County, Arizona (see enclosed project map).

The purpose of this mailer is to notify potentially interested parties including local, state, and federal agencies, and adjacent land owners of the updated proposed project described below. All comments must be received by October 20, 2004, and will be reviewed as part of the environmental analysis for the project. At this time, the BLM has decided to prepare an Environmental Assessment (EA) to determine whether or not the project will have significant environmental effects. The EA is expected to be available for public comment later this fall.

#### **PROPOSED ACTION**

The Proposed Action involves one single-circuit 500kV transmission line constructed on steel lattice or pole structures. The right-of-way would be approximately 200 feet in width and approximately 44 to 54 miles in length, including approximately 26 miles on BLM administered land. The proposed 500kV transmission line would originate at the Palo Verde Hub, at either the Palo Verde Nuclear Generating Station (PVNGS) Switchyard or the Duke Arlington Power Plant, and terminate at the future TS5 500/230kV Substation Site, to be located adjacent to the Central Arizona Project (CAP) canal at the CAP Pump Facility, west of 291st Avenue and north of the Beardsley Road alignment.

The Proposed Action may be built in its entirety with an in-service date of June 2007, or could be constructed in phases with the second phase in-service in the 2015 timeframe or later. The two options are detailed below.

Option 1: The Proposed Action may be constructed as one continuous project from the Palo Verde Hub to the future TS5 500/230kV Substation Site adjacent to the CAP Pump Facility. The in-service date is projected for June 2007. The proposed right-of-way, as it affects public land, would be built within the Palo Verde to Devers utility corridor as identified in the Lower Gila South Resource Management Plan (1988) and the CAP utility corridor as identified in the Lower Gila North Management Framework Plan (1983). The proposed action requires environmental compliance subject to the National Environmental Policy Act (NEPA).

Option 2: The Proposed Action may be constructed in two phases if the project originates at the Harquahala 500kV Interconnection Area. The Harquahala 500kV Interconnection Area would interconnect at either the Harquahala Power Plant (located approximately at Thomas Road and 491<sup>st</sup> Avenue) or a new switchyard facility that could be constructed at the intersection of the Palo Verde-Devers No. 1 line and the Harquahala to Palo Verde 500kV line (located approximately at Thomas Road west of 451<sup>st</sup> Avenue). This switchyard is being referred to as the Harquahala Junction 500kV Switchyard. The first phase of this project proposal would begin at the Harquahala 500kV Interconnection Area and would parallel the Palo Verde-Devers No. 1 Transmission Line to the north, and the CAP utility corridor to the east a total of approximately 29 to 34 miles, terminating at the future TS5 500/230kV Substation Site adjacent to the CAP Pump Facility. The in-service date for the first phase is projected for June 2007. The second phase would also begin at the Harquahala 500kV Interconnection Area and traverse south along the Palo Verde-Devers No. 1 and Harquahala 500kV corridor approximately 15 to 20 miles to the Palo Verde Hub. The in-service date for this phase is proposed for 2015 or beyond. The proposed action requires environmental compliance subject to NEPA.

## **DECISION TO BE MADE**

The decision to implement the Proposed Action involves the BLM, which has jurisdiction for approximately 630 acres of public lands involved in the project.

Implementation of the Proposed Action will depend on the following: 1) BLM Field Manager reviews the EA, including comments received, and documents the decision in a Decision Record that contains a Finding of No Significant Impact (FONSI); or 2) makes the decision to prepare an Environmental Impact Statement (EIS).

## **ISSUES**

At a minimum, the EA will discuss the existing conditions of each resource and environmental consequences of the Alternative(s) on the following issues:

- Biological Resources (plants, wildlife, threatened and endangered species, and livestock grazing)
- Cultural Resources (archaeological sites)
- Land Use (recreation, access, R/W, etc.)
- Visual Resources
- Socio-economics
- Physical Resources (waters of the U.S., ground/surface water use, air quality, etc.)

**NEPA PROCESS**

- 30-day public comment period
- Preparation of EA
- Decision Record issued
- Public Protest & Appeal Period

If you have any questions, please contact Camille Champion at (623) 580-5526.

Sincerely,

  
for Teresa A. Raml  
Field Manager

Enclosure  
Project Map

# PALO VERDE HUB TO TS5 500KV TRANSMISSION PROJECT

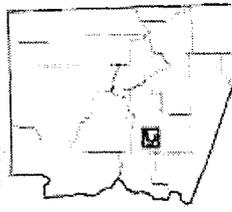
## Proposed Route

-  Option 1 (in-service 2007)
-  Option 2 - Phase 1 (in-service 2007)
-  Option 2 - Phase 2 (in-service 2015 or beyond)

## Reference Features

-  BLM Land
-  Bureau of Reclamation
-  Arizona State Land
-  Designated Utility Corridor (D.U.C.)
-  Study Area
-  500KV Transmission Line
-  345KV Transmission Line
-  230KV Transmission Line
-  Central Arizona Project Canal

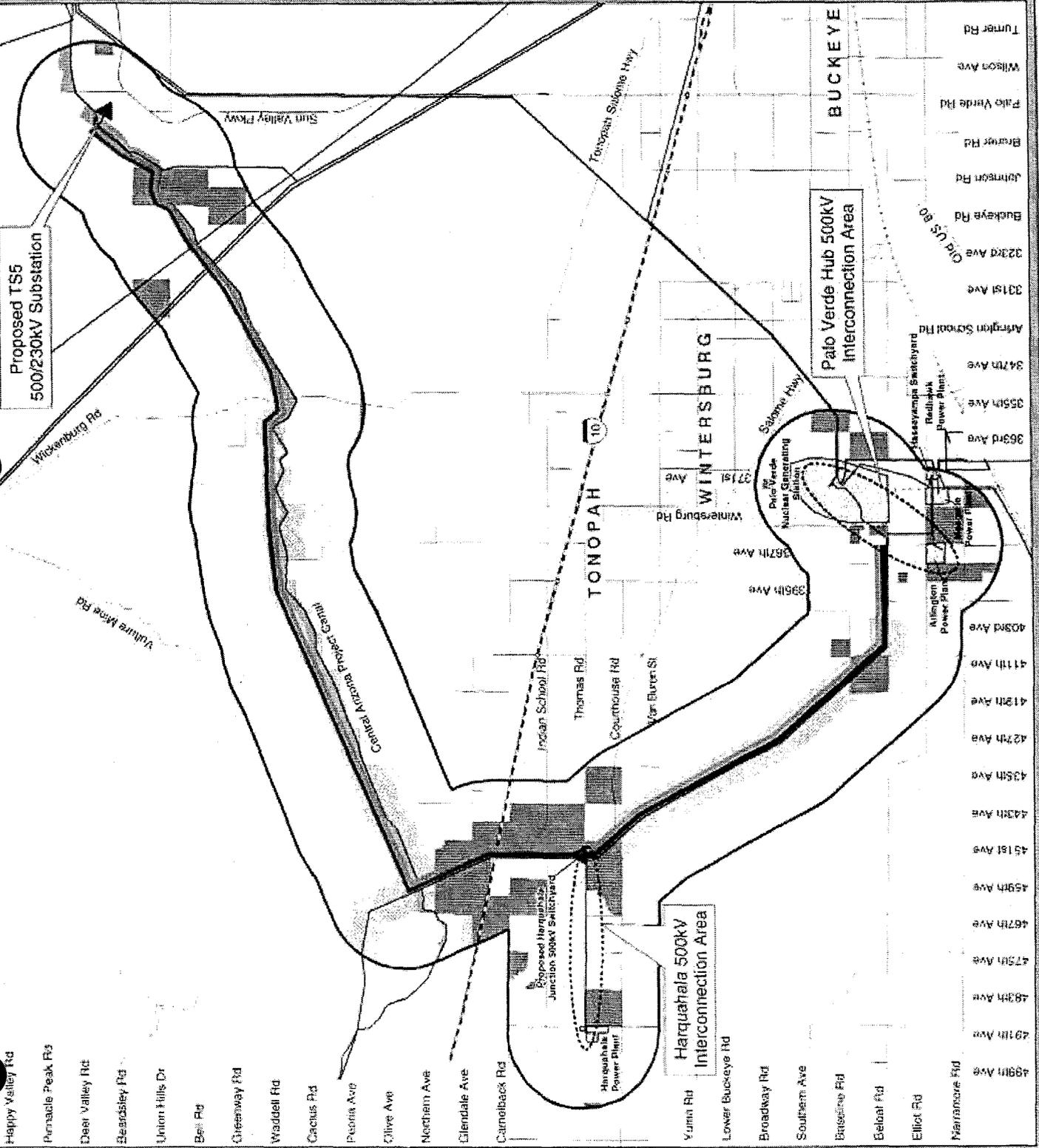
## Project Location



## Sources

- US Bureau of Land Management
- AZ Department of Transportation
- US Department of Transportation

September 15, 2004



- Happy Valley Rd
- Pinnacle Peak Rd
- Deer Valley Rd
- Beardsley Rd
- Union Hills Dr
- Beil Rd
- Greenway Rd
- Waddell Rd
- Cactus Rd
- Pasqua Ave
- Olive Ave
- Northern Ave
- Glendale Ave
- Camelback Rd
- Yuma Rd
- Lower Buckeye Rd
- Broadway Rd
- Southern Ave
- Baseline Rd
- Beloit Rd
- Elliot Rd
- Marrastore Rd

- 489th Ave
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- Turner Rd

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# APPENDIX E

**APPENDIX E**  
**PUBLIC COMMENT**

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**PALO VERDE HUB TO TS-5  
500kV TRANSMISSION PROJECT  
BLM ENVIRONMENTAL ASSESSMENT  
PUBLIC COMMENT AND RESPONSE SUMMARY TABLE\***

Comment No.	Date	Name	Comment Source	Issue	Comment (summary)	EA Location of Response
1	4/17/04	Paul Roetto, Friends of Saddle Mountain	Letter	Project alternatives/visual Project alternatives/environmental impacts Visual	Opposed to proposed route, prefers Westwing corridor because it is more direct. Westwing corridor would have less visual impacts than proposed route. Westwing corridor would have less environmental impacts than proposed route.	Refer to Chapter 2, Section 2.2 Refer to Chapter 2, Section 2.2 and Chapter 3, Section 3.3 Refer to Chapter 2, Section 2.2
2	4/20/04	David & Cynthia Mueller	Letter	Public input/alternatives Project alternatives Project alternatives	Impacts to views of Belmont Mountains and diminished property values  Only one route and substation site presented to the public, unlike other projects Prefers underbuilding existing Westwing lines, more economic and shorter. If Westwing route is not an option then line should go on north side of Belmont Mountains	Refer to Chapter 3, Section 3.3 Refer to Chapter 2, Section 2.2 Refer to Chapter 2, Sections 2.2 and 2.3 Refer to Chapter 2, Section 2.2 Refer to Chapter 3, Section 3.2
3	4/27/04	Keenan Murray, Arizona State Land Department (ASLD)	Letter	Land use (mineral rights)	Wants ASLD current and future mineral rights and exploration considered during right-of-way siting	
4	4/27/04	Renee Fugiel, CAP	Letter	Project description	Approve of proposed 500kV line as submitted	No comment
5	4/28/04	Timothy Flood, Friends of Arizona Rivers	Letter	Cumulative impacts Biology	Will there be cumulative effects if line is placed near the CAP Canal or existing 500kV line Will there be impacts to washes, riparian habitat, or Hassayampa River corridor	Refer to Chapter 4 Refer to Chapter 3, Section 3.5
6	4/28/04	Judith Shaw	Email	Biology (wildlife) Mitigation (wildlife) Project alternatives Visual Biology (wildlife) Project need Project alternatives Project description (cost) Reliability Visual/socioeconomics Reliability	Impacts to wildlife and zone of project impact including impacts from lines, poles, roads, and traffic (maintenance or recreational) Mitigation for wildlife impacts should include the acquisition and donation of lands of comparable biological replacement value Prefers Westwing route because it is shorter, more cost effective, more energy efficient, and there are already 2 lines in the proposed route Impacts along the CAP Canal Project is for new developments in northwest valley, not existing west side Opposes proposed route, prefers Westwing corridor as it is more direct Cost of construction and line losses along proposed route would compensate for cost of right-of-way along Westwing corridor Proposed route will have line losses due to extra length, Westwing corridor would be more energy efficient	Refer to Chapter 3, Section 3.5 Refer to Chapter 3, Section 3.5 Refer to Chapter 3, Section 3.5 Refer to Chapter 2, Section 2.2 Refer to Chapter 3, Section 3.3 Refer to Chapter 3, Section 3.5 Refer to Chapter 1, Section 1.2 Refer to Chapter 2, Section 2.2 Refer to Chapter 2, Section 2.2 Refer to Chapters 1 and 2 Refer to Chapter 3, Section 3.3 Refer to Chapter 2, Section 2.2
7	4/28/04	Paul Roetto	Email & letter	Project description (cost) Reliability Visual/socioeconomics Reliability	Proposed route will have impacts to views, wants to know if there is a system for compensation for view loss Keeping all the lines in the Westwing corridor would make it easier to guard them against a terrorist attack	Refer to Chapter 3, Section 3.3 Refer to Chapter 2, Section 2.2

**PALO VERDE HUB TO TS-5  
500KV TRANSMISSION PROJECT  
BLM ENVIRONMENTAL ASSESSMENT  
PUBLIC COMMENT AND RESPONSE SUMMARY TABLE\***

Comment No.	Date	Name	Comment Source	Issue	Comment (summary)	EA Location of Response
7 (cont.)	4/28/04	Paul Roetto	Email & letter	Mitigation Project description	If proposed route is approved AFS should provide public information on protection of wildlife, plants, cultural resources Access road along CAP Canal should be restricted to non-motorized except for maintenance vehicles	Refer to Chapter 3, Sections 3.4 and 3.5 and Appendix A Proposed project is located within a BLM designated utility corridor, refer to Lower Gila South Resource Management Plan and Lower Gila North Management Framework Plan Refer to Chapter 3, Section 3.4 Refer to Chapter 2, Section 2.2
8	4/29/04	Donald & Joyce Scherrer	Email	Cultural resources Project alternatives Project alternatives/visual Project alternatives/environmental impacts	Full surveys should be completed in Saddle Mountain/Palo Verde Hills area Opposed to proposed route, prefers Westwing corridor because it is more direct and would conserve energy Westwing corridor would have less visual impacts than proposed route Westwing corridor would have less environmental impacts than proposed route	Refer to Chapter 2, Section 2.2 and Chapter 3, Section 3.3 Refer to Chapter 2, Section 2.2
9	4/30/04	Sandy Bahr, Sierra Club	Letter	Planning process Project alternatives Visual Socioeconomics Cumulative effects	Impacts should be evaluated through an environmental impact statement Full range of alternatives should be considered including locating lines in 1-10 corridor, possibility for more distributed energy generation, and energy efficient development rather than more power lines Impacts north of I-10 Will promote sprawl style development, potential exchange of adjacent BLM lands Sprawl caused by project will result in impacts to traffic congestion, poor air quality, and negative impact on quality of life	Proposed project is located within a BLM designated utility corridor, refer to Lower Gila South Resource Management Plan, and Lower Gila North Management Framework Plan Refer to Chapter 2, Section 2.2 Refer to Chapter 3, Section 3.3 Proposed project is located within a BLM designated utility corridor, refer to Lower Gila South Resource Management Plan and Lower Gila North Management Framework Plan Proposed project is located within a BLM designated utility corridor, refer to Lower Gila South Resource Management Plan and Lower Gila North Management Framework Plan Refer to Chapter 3, Section 3.7 Refer to Chapter 3, Section 3.5 Refer to Chapter 3, Section 3.5 Refer to Chapter 3, Section 3.4 Proposed project is located within a BLM designated utility corridor, refer to Lower Gila South Resource Management Plan and Lower Gila North Management Framework Plan
				Soil Biology (vegetation) Biology (wildlife) Cultural Project description	Impacts to soil (soil disturbance) Introduction of exotic, invasive plant species and noxious weeds Impacts to wildlife, especially birds (near CAP Canal) Impacts to cultural sites Question need for 1-mile-wide corridor	

PALO VERDE HUB TO TS-5 500KV TRANSMISSION PROJECT BLM ENVIRONMENTAL ASSESSMENT PUBLIC COMMENT AND RESPONSE SUMMARY TABLE*						
Comment No.	Date	Name	Comment Source	Issue	Comment (summary)	EA Location of Response
10	4/30/04	Craig Weaver & Jason Williams, Arizona Wilderness Coalition	Letter	Project alternatives	Proposed route goes a great distance out of the way to reach the termination point	Refer to Chapter 2, Section 2.2
				Visual	Impacts to several scenic areas of public lands (and CAP Canal)	Refer to Chapter 3, Section 3.3
				Cumulative impact	Project would ring the Tonopah region with power lines	Refer to Chapter 2, Section 2.2 and Chapter 4
				Project alternatives	Alternatives considered should include decentralized energy production that would alleviate need for project	Refer to Chapter 2, Section 2.2
				Biology (wildlife)	Is near several Wilderness Areas, impacts to large bird populations (especially near CAP Canal)	Refer to Chapter 3, Section 3.5
				Cumulative impact	Project and other lines and associated roads have impact on adjacent roadless areas	Refer to Chapter 4
				Project description	Question need for 1-mile-wide corridor, thinks this is an indication that utility will require many more lines in the future	Refer to Chapter 4
				Socioeconomics	Need to consider value of damaged habitat, loss of scenic vistas, long-term damage to public lands and roads, eco-tourism, and outdoor based recreation	Proposed project is located within a BLM designated utility corridor, refer to Lower Gila South Resource Management Plan, and Lower Gila North Management Framework Plan
				Project alternatives	Include an economic analysis of more direct routes on private lands	Refer to Chapter 2, Section 2.2
				Project alternative	There is support for the No-Action alternative	Refer to Chapter 1, Section 1.2
11	9/27/04	Richard Isaacson	Letter	Project need	Approves of project, thinks it is needed to support future growth	No comment
12	9/28/04	Gerry Ramirez, ADOT	Letter	Project description	Project must receive an encroachment permit from ADOT prior to any work in ADOT right-of-way	APS will coordinate with ADOT
13	10/04/04	James Gross, ASLD	Letter	Project description	If project crosses State land and is not located in an existing right-of-way APS needs to immediately make appropriate application to ASLD	APS will coordinate with ASLD
14	10/04/04	Robert Woodring, MCDOT	Letter	Document review	Would like to receive a copy of the draft/final EA when available.	BLM to determine
				Project description	Recommends placement of towers to avoid encroachment into future road section line rights-of-way	Refer to Chapter 2, Section 2.3
15	10/12/04	Ann Howard, SHPO	Letter	Document review	Looking forward to reviewing Section 106 consultations	No comment
16	10/14/04	Keenan Murray	Letter	Land use (mineral rights)	Resubmission of 4/27 letter	Refer to Chapter 3, Section 3.2
17	10/27/04	Booker T. Coleman, Qwest	Letter	Project description	Appears to be no conflicts with Qwest facilities but blue staking must be completed prior to construction. Summarizes construction procedures required when crossing Qwest facilities	No comment

\*Table reflects comments submitted directly to BLM in response to informational letters mailed in March and September of 2004